Topock Project Executive Abstract

Document Title: Pacific Gas and Electric Company, Final Groundwater Human Health and Ecological Risk Assessment , Topock Compressor Station, Needles, California

Submitting Agency/Authored by: PG&E

Final Document? ☒ Yes ☐ No

Date of Document: November 12, 2009

Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other)
PG&E

Priority Status: ☒ **HIGH** ☐ **MED** ☐ **LOW**
Is this time critical? ☒ Yes ☐ No

Type of Document:
☐ Draft ☒ Report ☐ Letter ☐ Memo

☐ Other / Explain:

Action Required:
☒ Information Only ☐ Review & Comment
Return to: _____

By Date: _____
☐ Other / Explain:

What does this information pertain to?
☐ Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Preliminary Assessment (PA)
☒ RCRA Facility Investigation (RFI)/Remedial Investigation (RI) (including Risk Assessment)
☐ Corrective Measures Study (CMS)/Feasibility Study (FS)
☐ Corrective Measures Implementation (CMI)/Remedial Action
☐ California Environmental Quality Act (CEQA)/Environmental Impact Report (EIR)
☐ Interim Measures
☐ Other / Explain:

Is this a Regulatory Requirement?
☒ Yes
☐ No
If no, why is the document needed?

What is the consequence of NOT doing this item? What is the consequence of DOING this item?

Increased regulatory coordination after completion of the CMS/FS, potentially significant changes to CMS/FS, and potentially significant slip in overall schedule.

Added certainty that the CMS/FS will include language consistent with the findings and conclusions of the GWRA (delete appropriate chemicals of concern), thereby allowing the project to proceed on schedule.

Other Justification/s:
☐ Permit ☐ Other / Explain:

Brief Summary of attached document:

Evaluates the potential risks to human health and ecological receptors that could be exposed to constituents in groundwater at the Pacific Gas and Electric Company (PG&E) Topock Compressor Station.

Written by: ARCADIS on behalf of PG&E

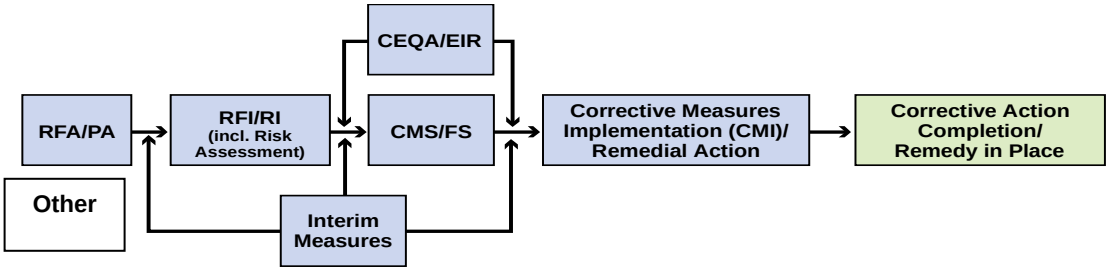
Recommendations: Approval of Human and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2 (GWRA) in order to keep schedule commitments.

How is this information related to the Final Remedy or Regulatory Requirements:
The GWRA will be used to help identify risks associated with chemicals in groundwater and chemicals which need to be carried forward for remediation.

Other requirements of this information?

Related Reports and Documents:

Click any boxes in the Regulatory Road Map (below) to be linked to the Documents Library on the DTSC Topock Web Site (www.dtsc-topock.com). **The link to the Documents Library is currently UNDER CONSTRUCTION.**



Version 8

Legend
RFA/PA – RCRA Facility Assessment/Preliminary Assessment
RFI/RI – RCRA Facility Investigation/CERCLA Remedial Investigation (including Risk Assessment)
CMS/FS – RCRA Corrective Measure Study/CERCLA Feasibility Study
CEQA/EIR – California Environmental Quality Act/Environmental Impact Report

Pacific Gas and Electric Company

Yvonne Meeks
Manager

Environmental Remediation
Gas T&D Department

Mailing Address
4325 South Higuera Sreet
San Luis Obispo, CA 93401
Location
6588 Ontario Road
San Luis Obispo, CA 93405
Tel: (805) 234-2257
Email: yjm1@pge.com

December 4, 2009

Mr. Aaron Yue
Chief, Permitting Unit, Geology Permitting and Corrective Action Branch
Department of Toxic Substances Control (DTSC)
5796 Corporate Avenue
Cypress, CA 90630

Ms. Pamela S. Innis
Office of Environmental Policy and Compliance
U.S. Department of Interior (USDOI)
P.O. Box 25007 (D-108)
Denver, CO 80225-0007

Subject: PG&E Topock Compressor Station, Needles, California
Human and Ecological Risk Assessment of Groundwater Impacted by Activities as Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2

Dear Mr. Yue and Ms. Innis:

Enclosed is the *Final Human and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2*, formerly titled *Draft Groundwater Human Health and Ecological Risk Assessment* (GWRA) for the Pacific Gas and Electric Company (PG&E) Topock Compressor Station (TCS). Despite the title change, this document is still being referred to here and throughout the document as the GWRA. PG&E prepared the GWRA in coordination with the RCRA Facility Investigation/Remedial Investigation (RFI/RI), and in accordance with the approved *Revised Human Health and Ecological Risk Assessment Work Plan* (ARCADIS, 2008) and *Revised Addendum to the Revised Human Health and Ecological Risk Assessment Work Plan* (ARCADIS, 2009).

Two versions of the Final GWRA were submitted electronically on November 12, 2009 incorporating revisions based on comments received from Department of Toxic Substances Control (DTSC) in a letter dated October, 28, 2009, and from the U.S. Department of the Interior (USDOI) in a letter dated November 5, 2009. These included:

1. The Final GWRA showing changes to the text in redline mode.
2. Cover letter and the clean version of the Final GWRA (with all changes accepted).

Concurrence on the Final GWRA was received from DTSC November 23, 2009 and from USDOI on November 19, 2009. No additional changes have been made to the Final GWRA since it was submitted to DTSC and DOI on November 12, 2009.

If you have any questions regarding this revised GWRA, please call me at (805) 546-5243.

Sincerely,

Yvonne Meeks
Topock Project Manager

Enclosures:
Final Human and Ecological Risk Assessment of Groundwater Impacted by Activities at SWMU 1/AOC1 and SWMU 2

cc: Carrie Marr, USFWS
Mike Eichelberger, DTSC
Shukla Roy-Semmen, DTSC
Karen Baker, DTSC
Dennis Smith, SAIC

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Human and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2

Topock Compressor Station
Needles, California

November 2009

ARCADIS

Kimberly Walsh, MPH
Principal Scientist

Bridgette DeShields
Risk Assessor
Vice President

Lisa R. Kellogg, PG, CEM
Project Manager

Human and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2

Topock Compressor Station
Needles, California

Prepared for:
Pacific Gas and Electric Company

Prepared by:
ARCADIS
2033 North Main Street
Suite 340
Walnut Creek
California 94596
Tel 925.274.1100
Fax 925.274.1103

Our Ref.:
RC000689.0006.00002

Date:
November 2009

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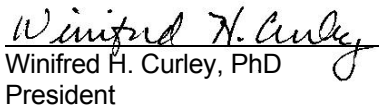

Winifred H. Curley, PhD
President

Novemer 13, 2009
Date

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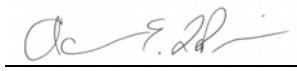

Adrienne LaPierre
Principal
Health Sciences Group

November 13, 2009
Date

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Acronyms and Abbreviations

AOC	area of concern
APE	area of potential effects
ARAR	applicable or relevant and appropriate requirement
BCW	Bat Cave Wash
bgs	below ground surface
BNSF	Burlington Northern Santa Fe

CACA	Corrective Action Consent Agreement
CAL	California Action Level
CalEPA	California Environmental Protection Agency
CDI	chronic daily intake
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
cm^2	square centimeters
CMS/FS	Corrective Measures Study/Feasibility Study
COC	constituent of concern
COPC	constituent of potential concern
CSF	cancer slope factor
CSM	conceptual site model
DRI	Dietary Reference Intake
DTSC	Department of Toxic Substances Control
EAR	estimated average requirements
E&E	Ecology and Environment
ED	exposure duration
EF	exposure frequency
EPC	exposure point concentration
ET	exposure time
GMP	groundwater monitoring program
GWRA	Groundwater Risk Assessment
HERD	Human and Ecological Risk Division
HHRA	human health risk assessment

HI	hazard index
HNWR	Havasu National Wildlife Refuge
HQ	hazard quotient
ICOPC	initial constituent of potential concern
IM	interim measure
IM3	Interim Measure #3
IOM	Institute of Medicine
IRIS	Integrated Risk Information System
L/d	liters per day
LOAEL	lowest observed adverse effects level
MCL	maximum contaminant level
mg/day	milligrams per day
mg/kg-bw/day	milligrams per kilogram body weight per day
mg/L	milligrams per liter
MWD	Metropolitan Water District of Southern California
NCP	National Contingency Plan
NOAEL	no observed adverse effects level
OEHHA	Office of Environmental Health Hazard Assessment
OTM	of the mean
PAH	polycyclic aromatic hydrocarbon
PBA	Programmatic Biological Assessment
PC	permeability coefficient
PCB	polychlorinated biphenyl

PG&E	Pacific Gas and Electric Company
PMP	Performance Monitoring Program
QAPP	Quality Assurance Project Plan
QA	quality assurance
QC	quality control
RAWP	Risk Assessment Work Plan
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RDA	recommended dietary allowance
RfD	reference dose
RfD_i	chronic inhalation reference dose
RfD_o	chronic oral reference dose
RFI/RI	RCRA facility investigation/remedial investigation
RME	reasonable maximum exposure
RMP	River Monitoring Program
RSL	regional screening level
SA	surface area
SAP	Sampling and Analysis Plan
SF_i	inhalation slope factor
SF_o	oral slope factor
(the) site	Pacific Gas and Electric Company (PG&E) Topock Compressor Station
SVOC	semivolatile organic compound
SWMU	solid waste management unit

TDS	total dissolved solids
TPH	total petroleum hydrocarbons
UCL	upper confidence limit
UF	uncertainty factor
µg/day	micrograms per day
µg/kg/day	micrograms per kilogram per day
µg/L	micrograms per liter
UL	tolerable upper intake level
USBLM	U.S. Bureau of Land Management
USBOR	U.S. Bureau of Reclamation
USDOI	U.S. Department of Interior
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UTL	upper threshold limit
VOC	volatile organic compound

Executive Summary

ES.1 Introduction

This Groundwater Human Health and Ecological Risk Assessment (GWRA) describes the potential risks to human health and ecological receptors associated with groundwater impacted by activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2 of the Pacific Gas and Electric Company (PG&E) Topock Compressor Station. PG&E is conducting investigative and remedial activities at the site, including this GWRA, pursuant to the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

The compressor station is located in eastern San Bernardino County, approximately 15 miles southeast of Needles, California. The compressor station occupies approximately 15 acres of a 65-acre parcel of PG&E-owned land. However, the Study Area[1] for investigative and remedial activities covers additional surrounding land owned and/or managed by government agencies including the U.S. Bureau of Land Management (USBLM), U.S. Bureau of Reclamation (USBOR), U.S. Fish and Wildlife Service (USFWS), San Bernardino County, California Department of Transportation, and Burlington Northern Santa Fe (BNSF) Railroad.

A complete description of the site background can be found in the *Revised Final RCRA Facility Investigation/Remedial Investigation Report, Volume 1 – Site Background and History* (Revised Final RFI/RI Volume 1; CH2M HILL, 2007a).

ES.1.1 Purpose

The purpose of this GWRA is to provide information about potential human health threats and ecological risks posed by groundwater impacted by chemical releases from SWMU 1/AOC 1 and SWMU 2 and to assist risk management decision making (USEPA, 1989; USEPA, 1997a). The approach, methods, and assumptions used in this GWRA are consistent with the Risk Assessment Work Plan (RAWP) (ARCADIS, 2008), reviewed and approved by the California Department of Environmental Protection (CalEPA) Department of Toxic Substances Control (DTSC) and the U.S. Department of the Interior (USDOI) (CalEPA, 2009; USDOI, 2009).

[1] The Study Area is located in the southern portion of the Mohave Valley, along the California/Arizona border in eastern San Bernardino County, California. The Area of Potential Effect (APE) depicted in the Programmatic Biological Assessment (PBA; CH2M HILL, 2007b) forms the approximate boundary of the RFI/RI Study Area. For purposes of this GWRA, Study Area and site are used interchangeably.

This GWRA evaluates all constituents detected in the groundwater, as presented in the *RCRA Facility Investigation/Remedial Investigation Report, Volume 2 – Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation* (RFI/RI Volume 2; CH2M HILL, 2009a) and the *RCRA Facility Investigation/Remedial Investigation Report, Volume 2 Addendum: Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigations* (RFI/RI Volume 2 Addendum; CH2M HILL, 2009b)[2], and identifies the constituents that could pose an unacceptable risk to either human health or the ecological environment. Constituents are evaluated in the GWRA even if the RFI/RI Volume 2 (CH2M HILL, 2009a) concludes that the constituents are not related to SWMU 1/AOC 1 or SWMU 2. The GWRA combines the quantitative estimates of risk with the findings of the RFI/RI Volume 2 and recommends a final list of compounds, referred to as Constituents of Concern (COCs), to be carried forward to the Corrective Measures Study/Feasibility Study (CMS/FS).

As defined by the RFI/RI Volume 1 (CH2M HILL, 2007a), the SWMUs and AOCs addressed in the RFI/RI Volume 2 and Addendum (CH2M HILL, 2009a; 2009b) and this GWRA are those associated with the historical discharge of wastewater from the facility. These include:

- SWMU 1/AOC 1 – Bat Cave Wash (BCW) former percolation bed and surrounding area
- SWMU 2 – Inactive Injection Well PGE-08.

Wastewater discharged to the BCW consisted primarily of cooling tower blowdown (about 95%) and a minor volume of effluent from an oil/water separator and other facility maintenance operations (about 5%). Between 1951 and 1964, the wastewater discharged contained hexavalent chromium. Groundwater data results indicate that the hexavalent chromium plume (greater than the site-specific background value of 32 micrograms per liter [µg/L]) is confined to the alluvial aquifer and extends from the southern edge of the alluvial aquifer (upper BCW) to the Colorado River floodplain, covering about 90 acres. Natural reducing conditions observed in the shallow and mid-depth fluvial sediments in the floodplain area significantly limits the movement of hexavalent chromium and results in a sharp decrease in hexavalent chromium concentrations in groundwater in the floodplain adjacent to the Colorado River (CH2M HILL, 2009a). This GWRA was conducted to assess potential risks associated with the recognized groundwater plume and other constituent detections in groundwater and to evaluate the significance of the potential transport pathway from the groundwater to the Colorado River.

[2] The RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) includes data collected through September 2008. The GWRA includes data presented in the Addendum collected through July 2008.

ES.1.2 Regulatory Framework

The CalEPA DTSC is the lead state agency directing remedial and investigative activities for the project in accordance with federal RCRA. Under terms of the Corrective Action Consent Agreement (CACA) signed with DTSC in February 1996, PG&E agreed to conduct an RFI to identify and evaluate the nature and extent of hazardous waste and constituent releases at the site. The USDOI is the lead federal agency responsible for oversight of CERCLA response actions being conducted by PG&E for the portions of the site on land managed by the federal agencies (USBLM, USBOR, and USFWS) identified above. In July 2005, PG&E and the federal agencies entered into an Administrative Consent Agreement (USDOI, 2005) to implement response actions at the site as set forth in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300).

ES.2 Site History and Study Area Characteristics

A general description of Study Area characteristics (geology, hydrogeology, ecology, and land use) and site history, including operations and environmental investigations, is presented below. Sources of background information were the *Final Programmatic Biological Assessment* (PBA; CH2M HILL, 2007b), Revised Final RFI/RI Volume 1 (CH2M HILL, 2007a), RFI/RI Volume 2 (CH2M HILL, 2009a), and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b).

ES.2.1 Site Physical Characteristics

ES.2.1.1 Geology

The site is located in the Mohave Valley, along the California-Arizona border in eastern San Bernardino County, California. The site occupies approximately three square miles of the north-sloping piedmont alluvial terrace and floodplain along the northern margin of the mountains. Alluvial terraces and incised drainage channels characterize the landforms. BCW is a prominent desert wash that crosses the Study Area from south to north. The unconsolidated alluvial and fluvial deposits are underlain by the Miocene conglomerate and pre-Tertiary metamorphic and igneous bedrock.

ES.2.1.2 Hydrology and Hydrogeology

The site is situated at the southern extent of unconsolidated alluvial aquifer material in the Mohave groundwater basin. The Colorado River runs north to south through the basin. Groundwater occurs under unconfined to semi-confined conditions beneath most of the site. The saturated portion of the alluvial fan and fluvial sediments are collectively referred as the alluvial aquifer. In the floodplain area adjacent to the Colorado River, the fluvial deposits interfinger with, and are hydraulically connected to, the alluvial fan deposits. The unconsolidated alluvial and fluvial deposits are underlain by bedrock with very low

permeability; therefore, groundwater movement occurs primarily in the overlying unconsolidated deposits, and groundwater flow is generally north to northeasterly. Due to the variable topography at the site, the depth to groundwater ranges from as shallow as 5 feet below ground surface (bgs) in floodplain wells next to the river to approximately 170 feet bgs at the upland alluvial terrace areas.

ES.2.2 Ecological Characteristics

The site is located adjacent to and includes a portion of the 37,515-acre Havasu National Wildlife Refuge (HNWR) managed by USFWS. The area is characterized by arid conditions and high temperatures and consists of a series of terraces divided by dry desert washes (CH2M HILL, 2005a). The site is located either within the Mojave Desert province of California, the Colorado Desert, or the boundary between these two deserts (CH2M HILL, 2005a). The upland terrestrial habitats are typical of Mojave Desert uplands dominated by creosote bush scrub, with Mojave Wash, desert riparian, and tamarisk thicket. The BCW (AOC 1/SWMU 1) is an ephemeral drainage that consists of areas of sand, gravel, and cobblestone substrate interspersed with widely spaced desert wash vegetation, including mesquite and creosote (CH2M HILL, 2007b). BCW is located west of the Colorado River, in the Mojave Wash habitat, and extends from the Chemehuevi Mountains to the Colorado River approximately 3,500 feet north of the site. This wash may periodically flood during stormwater runoff events, but remains dry throughout most of the year due to arid desert conditions.

The Colorado River is the primary aquatic habitat located approximately 1,300 feet east of the compressor station. Small patches of emergent vegetation exist along the banks of the Colorado River, with little to no submergent vegetation within the river. The Topock Marsh, extending northeast of the area of potential effects (APE) within the HNWR, provides important aquatic marsh and riparian habitat in the local vicinity. Salt cedar (i.e., tamarisk) is an exotic plant species that has become the dominant plant community along the Colorado River floodplain. This plant community consists of dense thickets of tamarisk or salt cedar sometimes surrounded by arrowweed (*Pluchea sericea*).

Special-Status Species – The PBA (CH2M HILL, 2007b) was conducted to evaluate potential impacts to species and habitats that may be associated with activities in support of the RFI/RI. The PBA concluded a critical habitat effect determination of “no effect” for all but one special-status species evaluated. The bonytail chub (*Gila elegans)* was concluded to have a critical habitat effect determination of “may affect, but not likely to adversely affect.” There are no state or federally listed threatened or endangered plant species potentially present in the riparian areas. In uplands, smoke tree (*Psorothamnus spinosus*) is potentially present and is an Arizona state protected species.

ES.2.3 Land Use

Current – The compressor station is located in a sparsely populated, rural area. A major gas utility and transportation corridor is located within the site as well as the BNSF Railroad (railroad owned land) and the I-40 freeway (California Department of Transportation owned land).

The compressor station occupies approximately 15 acres of a 65-acre parcel of PG&E-owned land. PG&E also owns a 100-acre parcel located about 0.25 miles north of the compressor station, where interim measures (IMs) for the site are located. In addition to the PG&E 100-acre parcel, the surrounding area includes land owned and/or managed by a number of government agencies, including the USBLM, USBOR, USFWS, and San Bernardino County. The USBLM-managed lands within the area are owned by USBLM, San Bernardino County, and USBOR. These lands are considered public; however, public use is not encouraged, as the Topock Maze, a culturally significant area for several Native American tribes, is located here, within the boundary of the HNWR. The HNWR (land that is managed by USFWS) extends from the upper end of the Topock Marsh southward, to the head of Lake Havasu on the Arizona side of the Colorado River and is a recreational area. The compressor station is completely surrounded by the HNWR.

The nearest residents are located in Topock, Arizona, a seasonal community of about 20 (mostly retired senior citizens) in a small mobile home park near the Topock Gorge Marina. A few permanently occupied homes are located on the southern side of I-40, along the shoreline between the pipeline bridge and the I-40. Moabi Regional Park is a recreational facility operated by the San Bernardino County Department of Parks and Recreation. It is located on land leased from USBLM. As a regional park, it has no permanent full-time residents.

There are two known active supply wells in the APE: PM-04, located in Park Moabi (on the northwest section of the APE), and Sanders, located on the Arizona side of the Colorado River.

Future – PG&E plans to continue owning and operating the compressor station and associated property as an industrial operation for the foreseeable future. The railroad and highway will also continue in their current use for the foreseeable future. Accordingly, the reasonably anticipated future use of these areas is the same as their current use, industrial operations. The primary conservation mission of USFWS, as it applies to the HNWR, limits human use of HNWR property. Therefore, in the future, human use of HNWR property will continue to be restricted to recreational uses. Similarly, future use of the USBLM-owned land at the site is likely to remain recreational. Nonetheless, as recommended by USDOI, future uses of the USBLM-owned property could include seasonal residential use and year-round residential use for San Bernardino County staff at Park Moabi, and recreational (i.e., camping) use on the floodplain. As discussed in the RAWP (ARCADIS, 2008), although future residential use of the USBLM land is unlikely, USDOI has specifically requested an evaluation of future residential use on USBLM property.

ES.2.4 Site Historical Operations

In December 1951, the compressor station began operations to compress natural gas supplied from the southwestern United States for transport through pipelines to PG&E's service territory in central and northern California. The greatest use of chemical products at the facility involves treatment of cooling water, and the greatest volume of waste produced consists of blowdown from the cooling towers (i.e., water that is routinely removed from the towers to prevent salt buildup and scale formation).

From 1951 to 1985, hexavalent chromium-based products were added to the cooling water to inhibit corrosion, minimize scale formation, and control biological growth. From 1951 to 1964, untreated wastewater (i.e., blowdown) containing hexavalent chromium was discharged to the BCW. Beginning in 1964, the wastewater was treated to reduce hexavalent chromium to trivalent chromium. In 1970 the treatment process added a step where the trivalent chromium was removed via precipitation. In 1970, the treated wastewater was discharged to an injection well (PGE-08) located on PG&E property, and discharges to the BCW generally ceased. Use of the injection well ceased in 1973 and wastewater was discharged exclusively to the four, single-lined evaporation ponds, located about 1,600 feet west of the compressor station.

In 1985, PG&E ceased the use of hexavalent chromium and discontinued operation of the wastewater treatment system. The wastewater treatment system and the single-lined ponds were physically removed and clean-closed between 1988 and 1993. The four, Class II double-lined ponds, which are on USBLM property, are still in use and are operated under jurisdiction of the Regional Water Quality Control Board, Colorado River Basin Region.

ES.2.5 Groundwater and Surface Water Investigations

Groundwater and surface water investigations are discussed in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b). RFI/RI field activities began in June 1997, and six phases of work were completed between July 1997 and October 2007. Additional data and information were collected between October 2007 and September 2008 and select information reported in the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b). Groundwater and surface water data presented in both the RFI/RI Volume 2 and the RFI/RI Volume 2 Addendum[2] are used in this GWRA.

ES.3 Analytical Results and Data Evaluation Process

Multiple phases of investigation were conducted at the site since the CACA was signed in 1996. This GWRA relies on the data presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b)[2], along with surface water data collected by the Metropolitan Water District of Southern California (MWD). Groundwater and/or surface water monitoring included sampling and analysis for:

- Total chromium and hexavalent chromium

- 18 metals consisting of: aluminum, antimony, arsenic, barium, beryllium, cadmium, total chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc

- Other constituents measured less frequently than hexavalent chromium and the eighteen metals listed above including: volatile organic compounds (VOCs); semivolatile organic compounds; polychlorinated biphenyls; perchlorate; strontium; radionuclides; and total petroleum hydrocarbons in the gasoline, diesel, and motor oil ranges

- General chemistry parameters including, but not limited to, major cations (e.g., sodium, potassium, calcium, magnesium); major anions (e.g., fluoride, chloride, bicarbonate, sulfate); total dissolved solids (TDS) and associated parameters of specific conductance and salinity; temperature; pH; and redox sensitive parameters (e.g., oxidation-reduction potential, dissolved oxygen, nitrate, ammonia, manganese, iron, sulfide, and total organic carbon)

In general, all constituents detected during the groundwater monitoring programs (GMPs) are considered for inclusion in the risk assessment process. The primary constituents analyzed in the groundwater and surface water sampling programs were total chromium and hexavalent chromium. More limited analysis of the groundwater and surface water samples has occurred for other select metals. In addition to the surface water monitoring data conducted by PG&E, MWD has been monitoring for hexavalent chromium and other metals in the Colorado River for the last few years. The MWD data (validation of trace metals in progress) provides useful information that supplements the existing RFI/RI Volume 2 data.

In addition to the RFI/RI groundwater and surface water sampling programs, PG&E implemented a Groundwater Background Study to more completely evaluate the range of naturally occurring metals concentrations, including hexavalent chromium, in groundwater in the vicinity of the site (CH2M HILL, 2008a). The final results of the Groundwater Background Study were submitted on July 23, 2008 (CH2M HILL, 2008b). This is the background dataset that was used in this GWRA to differentiate between constituents that are potentially detected above background and, therefore, need to be carried through as constituents of potential concern (COPCs) in the quantitative GWRA.

Consistent with the approach set forth in the RAWP (ARCADIS, 2008), the groundwater and surface water monitoring data were organized and evaluated in the following groups:

- Background groundwater
- Site groundwater[3]
- Floodplain groundwater (a subset of site groundwater used to evaluate potential for migration of site-related constituents to the river)
- Surface water.

ES.4 Identification of Initial Constituents of Potential Concern

One of the first steps in the risk assessment process is the data evaluation step, in which the available groundwater and surface water data collected for the RFI/RI are narrowed down to a list of "initial constituents of potential concern" (ICOPCs) through exclusion of constituents or general chemistry parameters that are not applicable to human health or environmental risk assessments (e.g., TDS and pH) or have not been detected at the site (e.g., PCBs). A screening evaluation was developed, in consultation with DTSC and USDOI, and as documented in the RAWP Addendum (ARCADIS, 2009), in order to assess whether the general chemical parameters (i.e., chemical parameters that have been monitored in order to understand characteristics of the waters in each hydrogeologic group, and to identify water sources, key chemical processes, and reactions that may be occurring along flowpaths) should be considered as ICOPCs, based on their potential to pose a risk to either human health or the ecological environment. The screening-evaluation was also used to assess whether certain other constituents detected infrequently in groundwater (e.g., VOCs) should be considered as ICOPCs and included in the subsequent steps of the risk assessment process. Separate lists of ICOPCs were developed for: (1) evaluation of future hypothetical direct human exposure to groundwater (groundwater ICOPCs), and (2) evaluation of the potential for constituents in the floodplain wells to be released to the surface water (floodplain ICOPCs).

For each of the ICOPCs, the groundwater and surface water data were evaluated for usability by applying the criteria specified in the RAWP (ARCADIS, 2008). Non-detect data and duplicate sample results were handled conservatively in accordance with the RAWP.

[3] Site groundwater data includes all results from the Study Area other than background groundwater data. Site groundwater is not strictly limited to the area underlying the Topock Compressor Station.

ES.5 Identification of Constituents of Potential Concern

Consistent with the approach set forth in the RAWP (ARCADIS, 2008), the selection of COPCs in site groundwater was a sequential process where constituents were eliminated from further consideration if present at concentrations consistent with background conditions. COPCs in site groundwater are defined in two contexts:

- Well-Specific COPCs – COPCs are defined for each site groundwater well individually. These well-specific COPCs are selected from the list of groundwater ICOPCs described above and are the basis of the well-specific human health risk assessment (HHRA).

- Floodplain COPCs – COPCs are defined on a site-wide basis, with all data from the site groundwater wells grouped together. These floodplain COPCs are selected from the list of floodplain ICOPCs described above and are the basis of the groundwater-to-surface water transport evaluation.

ES.5.1 Well-Specific COPC Selection

Well-specific COPCs are defined as those groundwater ICOPCs that are determined to be present in an individual well at concentrations above background levels. As described in the RAWP (ARCADIS, 2008), for each groundwater ICOPC detected in a particular well, one or more statistical analyses were conducted to determine whether the ICOPC is present in the well above background levels and can be considered a well-specific COPC. Those groundwater ICOPCs that are determined to not be present above background levels in well-specific groundwater are excluded from the subsequent well-specific HHRA. Constituents that were retained as well-specific COPCs were evaluated quantitatively for contribution to potential risk in the well-specific risk characterization. Exposure point concentrations (EPCs) of well-specific COPCs are calculated using the U.S. Environmental Protection Agency (USEPA) statistical software package ProUCL 4.0, when sufficient samples exist, defined more fully below under Exposure Assessment.

ES.5.2 Floodplain COPC Selection

Floodplain COPCs are defined as those floodplain ICOPCs that are determined to be present in site-wide groundwater at concentrations above background levels. Evaluation of whether a floodplain ICOPC is present in site-wide groundwater above background levels uses the same sequence of steps and statistical analyses as the process for selection of well-specific COPCs. The only two differences are that in the well-specific evaluation, only constituent data from the individual well are evaluated against the background dataset; whereas in the floodplain evaluation, constituent data from all site wells combined are evaluated against the background dataset. And secondly, the floodplain ICOPC list is used instead of the groundwater ICOPC list. Those floodplain ICOPCs that are determined to be present above background levels in site-wide groundwater are included as floodplain COPCs in the groundwater-to-surface water transport

evaluation. Those floodplain ICOPCs that are determined to not be present above background levels are excluded from the groundwater-to-surface water transport evaluation.

ES.5.3 Evaluation of the Groundwater-to-Surface Water Transport Pathway

In accordance with the RAWP (ARCADIS, 2008), the evaluation of whether there could be significant transport of site-related constituents to surface water (i.e., the Colorado River) was based on a series of screening-level evaluations for those constituents determined to be floodplain COPCs. The sequential screening process was based first on a comparison of floodplain groundwater EPCs to surface water criteria, secondly on a comparison of downstream surface water results to surface water criteria, and lastly on a comparison of downstream to upstream surface water concentrations. The result of these comparisons was that no constituent was retained as a surface water COPC. In other words, the groundwater-to-surface water transport evaluation indicates that the potential transport of constituents in groundwater to the Colorado River represents an insignificant transport pathway: floodplain COPCs are not being transported to the Colorado River at concentrations that exceed screening-level surface water criteria. Accordingly, it may be concluded that quantitative surface water human health and ecological risk assessments are not warranted.

ES.6 Exposure Assessment

To determine whether COPCs are present in groundwater at levels that may potentially pose an unacceptable risk to human health or the environment, populations that potentially may be exposed to COPCs in groundwater and the pathways by which the exposures may occur were identified. As described more fully below, and in accordance with the RAWP (ARCADIS, 2008), the human population evaluated in this GWRA is referred to as the “hypothetical future groundwater water user” because there are no current users of the underlying groundwater affected by the plume. At DTSC Human and Ecological Risk Division’s (HERD’s) request, the ecological risk assessment was expanded to include three additional exposure pathways in addition to the groundwater-to-surface water pathway planned in Section 7 of the RAWP (ARCADIS, 2008). The new potential pathways evaluated are (1) shallow-rooted wetland plant exposure to chemicals in groundwater via root uptake; (2) deep-rooted plant (i.e., phreatophyte) exposure to chemicals in groundwater via root uptake; and (3) transfer of hexavalent chromium, molybdenum, nitrate, and selenium in groundwater to plant foliage via root uptake and translocation, then potential ingestion of these COPCs in plant tissue by herbivorous mammals. Of particular interest to DTSC was the potential for nitrate exposure via plant tissue ingestion by the desert bighorn sheep. The relationship between the constituent sources, potential exposure pathways, and potential receptors at the site provide the basis for the quantitative risk assessment. Only those complete source-pathway-receptor relationships are included in this GWRA.

ES.6.1 Sources of Groundwater Contamination

The principal site-related constituent in groundwater at the site is hexavalent chromium, which was contained in water-treatment products added to the cooling water from 1951 to 1985. Nearly all of the hexavalent chromium present in groundwater at the site is believed to have been released during the 13-year period when untreated cooling tower blowdown water containing hexavalent chromium was discharged to the BCW.

Although the historical releases from the BCW discharge are known to have resulted in groundwater impacts, it is not yet clear whether any releases from other industrial operations occurring inside the compressor station have impacted groundwater. Moreover, it is not yet clear if there are additional sources of groundwater contamination outside the compressor station, because the soil characterization is not yet complete. One of the objectives of the additional soil characterization activities, as specified in the *Draft RFI/RI Work Plan Part A* (CH2M HILL, 2006), is to verify whether there are additional sources, other than those related to the BCW, that are impacting or have the potential to impact the groundwater. For purposes of this GWRA, the entire existing network of monitoring wells is being evaluated. In the event that other potential sources to groundwater are identified during the soil investigation that were not adequately characterized by the existing well network, an addendum to this GWRA can be prepared, if appropriate, to address newly identified sources.

ES.6.2 Potential Transport Mechanisms

As specified in the RAWP (ARCADIS, 2008), once constituents are in the groundwater, the potential pathways through which the constituents may move from the groundwater to other environmental media include transport and release to the surface water (Colorado River) and volatilization of VOCs from the groundwater and release into ambient/indoor air. Both of these transport mechanisms are believed to be insignificant; the groundwater-to-surface water transport pathway was determined to be insignificant, and no VOCs were identified as COPCs.

At DTSC HERD's request, potential exposure of shallow-rooted wetland plants and phreatophytes to COPCs (hexavalent chromium, molybdenum, nitrate, and selenium) in groundwater was evaluated. Also at DTSC HERD's request, potential exposure of herbivorous mammals to COPCs (originating in groundwater) via ingestion of plant tissue was evaluated.

ES.6.3 Potentially Exposed Populations and Exposure Pathways

Under current conditions, there are no users of the underlying groundwater affected by the plume. Site groundwater is designated as having beneficial uses in the Colorado River Basin Plan (CRWQCB, 2006), and it is at least theoretically possible that site groundwater may be extracted and used as a potable water source in the future. Thus, in accordance with the RAWP (ARCADIS, 2008), the potentially exposed human

populations for this GWRA are "future hypothetical residential groundwater users" who may be exposed to COPCs in site groundwater in a residential setting. Both child and adult future hypothetical residential groundwater users are considered in the GWRA. The future hypothetical groundwater users may be exposed to COPCs once the groundwater is extracted (from one or more water-supply wells) and used as tap water and contacted via direct ingestion and through dermal contact while bathing or showering.

To place the projected hypothetical future groundwater risks into context, it is important to remember that the only portion of the site and surrounding Study Area that have even a marginal likelihood of being developed and used for residential purposes is the USBLM land, located north of the railroad (USDOI, 2007). Thus, calculated human health risks presented in this GWRA are truly hypothetical and are used strictly for remedial planning purposes. Future domestic use of the underlying groundwater, were it ever to occur, would most likely be limited to USBLM land located north of the railroad.

Potentially exposed ecological receptors are:

- Shallow-rooted wetland plant exposure to chemicals in groundwater via root uptake.
- Deep-rooted phreatophyte exposure to chemicals in first encountered groundwater via root uptake.
- Transfer of COPCs (hexavalent chromium, nitrate, molybdenum, and selenium) in groundwater to plant foliage via root uptake and translocation, then potential ingestion of COPCs in plant tissue by herbivorous mammals. Of particular interest to DTSC, was potential exposure of ruminants, specifically the desert bighorn sheep (*Ovis canadensis nelsoni*) to nitrate accumulated in phreatophyte tissue.

These pathways and receptors were evaluated at DTSC HERD's request, and the pathways were found to be potentially complete but insignificant.

ES.6.4 Exposure Point Concentrations

The EPC is defined as the estimated average concentration of the physical or constituent agent in the exposure medium over the period of exposure, and represents a reasonable estimate of the concentration likely to be contacted over time. In this GWRA, it is assumed that the quality of domestic tap water would be unchanged from that of groundwater, thus EPCs are based on the concentrations of constituents measured in site groundwater. Due to the uncertainty associated with estimate of average exposure concentration, the EPC is typically calculated as the 95% upper confidence limit (UCL) of the mean (OTM) concentration of the constituent in the exposure medium.

In accordance with the RAWP (ARCADIS, 2008), the calculation of 95% UCLs and other statistical analyses are performed using the USEPA statistical software package ProUCL 4.0. In order for ProUCL 4.0 to reliably

evaluate a specific dataset (e.g., calculate a 95% UCL for a particular constituent at a particular well), the dataset must include at least eight results including at least five detections. As specified in the RAWP (ARCADIS, 2008), if the dataset does not meet these criteria, ProUCL 4.0 cannot reliably process the data, and the EPC is conservatively assumed to be the maximum detected concentration in the dataset.

ES.6.5 Quantification of Potential Constituent Intakes

Constituent intake is a function of the estimated concentration of the constituent in the exposure medium (e.g., groundwater), the assumed contact rate between the receptor and the exposure medium, the assumed frequency and duration of the exposure, the assumed body weight of the receptor, and the estimated time period over which the exposure is normalized. The estimation of chronic daily intake (CDI) of a constituent in groundwater, through ingestion or dermal contact, is based on the standard default equations found in risk assessment guidance (USEPA, 1989). In accordance with the RAWP (ARCADIS, 2008), for the hypothetical residential groundwater user, standard default exposure assumptions were used to estimate contact with groundwater as potable water (USEPA, 2001; CalEPA, 1992; USEPA, 2004; CalEPA, 2005).

CDIs were calculated for the groundwater ingestion and groundwater dermal contact pathways for the child and adult future hypothetical groundwater users; CDIs were calculated for each individual well. In conjunction with toxicity data, these CDIs are used to characterize the potential cancer risks and noncancer hazards associated with future hypothetical groundwater exposures.

ES.7 Toxicity Assessment

Toxicity assessment characterizes the relationship between the magnitude of exposure to a constituent and the potential for adverse effects. More specifically, the toxicity assessment identifies or derives toxicity values that can be used to estimate the likelihood of adverse effects occurring in humans at different exposure levels. Consistent with regulatory risk assessment policy, adverse health effects resulting from constituent exposures are evaluated in two categories: carcinogenic effects and noncarcinogenic effects. In addition, the adverse health effects associated with exposure to lead are evaluated separately by comparison of estimated lead EPCs to the California Action Level[4] (CAL) for lead in drinking water.

ES.7.1 Carcinogenic Effects

Current HHRA practice for carcinogens is based on the assumption that, for most substances, there is no threshold dose below which carcinogenic effects do not occur. The potency of a potential carcinogen is

[4] The CAL for lead provided in CCR Title 22, Division 4, Chapter 17.5, Article 3, Section 64678.

quantified by the cancer slope factor (CSF). The CSF represents the excess lifetime cancer risk due to a continuous, constant lifetime exposure to a specified level (i.e., unit dose) of a carcinogen. CSFs are generally reported as excess incremental cancer risk per milligram of constituent per kilogram body weight per day (mg/kg-bw/day). Separate CSFs are generally reported for inhalation and oral exposures; these CSFs are referred to as the inhalation slope factor (SF_i) and the oral slope factor (SF_o), respectively. Both dermal and oral exposures are generally evaluated using SF_o. Consistent with California risk assessment guidance (CalEPA, 1994), CSFs were selected first from the CalEPA Office of Environmental Health Hazard Assessment (OEHHA) Toxicity Criteria Database (CalEPA, 2008); and then from USEPA on-line *Integrated Risk Information System* (IRIS) (USEPA, 2008a). Only one COPC in groundwater at the site is classified as an oral carcinogen: arsenic.

ES.7.2 Noncarcinogenic Effects

The toxicity assessment for noncarcinogenic effects is based on the assumption that there exists a threshold level of exposure below which no adverse health effects occur. This threshold level varies from individual to individual, so toxicity parameters for noncarcinogenic effects are established by regulatory agencies to be protective of sensitive individuals in the population (USEPA, 1989). The toxicity parameter that is typically used to evaluate noncarcinogenic effects is the reference dose (RfD). The RfD represents an intake level, expressed in mg/kg-bw/day, that would not be expected to cause adverse noncancer health effects in potentially exposed populations, including sensitive subpopulations (USEPA, 1989). Thus, the RfD is often referred to as the "acceptable dose."

Analogous to CSFs, chronic RfDs are generally reported for inhalation and oral exposures (RfD_i and RfD_o, respectively). Both dermal and oral exposures are generally evaluated using RfD_o.

The RfD_o values used to evaluate the potential noncarcinogenic toxicity of COPCs in groundwater were obtained from IRIS (USEPA, 2008a), and then USEPA *Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites* (USEPA, 2008b).

ES.7.3 Lead

Lead is classified as a noncarcinogen by USEPA and CalEPA. The noncarcinogenic toxicity of lead is not evaluated using the traditional RfD approach, however, because most human health effects data are based on blood-lead concentration, rather than external dose (CalEPA, 1993). Instead, the level of concern with respect to lead concentrations in site groundwater is established at the CAL for lead of 0.015 milligrams per liter (mg/L)[4], as the CAL is a legally enforceable standard designed to protect public health.

Because lead is not evaluated as other noncarcinogens using the traditional RfD approach, lead is discussed separately from other constituents throughout this GWRA.

ES.8 Risk Characterization

The methodologies used to estimate the potential cancer risk and noncancer hazard associated with exposure to COPCs in groundwater are based principally on guidance provided in standard regulatory documents (USEPA 1989 and 1991; CalEPA 1992 and 1994).

In accordance with the RAWP (ARCADIS, 2008), cumulative cancer risks and noncancer hazard indices (HIs) are estimated for all COPCs identified in Section 4 of this GWRA, even those constituents that the RFI/RI Volume 2 (CH2M HILL, 2009a) concluded were not related to SWMU 1/AOC 1 or SWMU 2. The final list of constituents to be carried forward to the CMS/FS, referred to as the COCs, will consist of those constituents that could potentially pose an unacceptable risk/hazard to future hypothetical groundwater users, and that may be associated with SWMU 1/AOC 1 or SWMU 2 as defined in the RFI/RI Volume 2 (CH2M HILL, 2009a).

Cancer – Cancer risks were estimated on a cumulative basis including summing estimated risk for multiple exposure pathways. Ordinarily, risks would also be summed for multiple constituents, but only one COPC (arsenic) is classified as an oral carcinogen. The calculated total potential cancer risk associated with exposure to carcinogenic COPCs in groundwater is compared to the "acceptable" cancer risk level as defined and endorsed by relevant state and federal agencies. The NCP is cited by USEPA (1989) as the basis for defining acceptable incremental cancer risk levels. According to the NCP, lifetime incremental cancer risk levels posed by a site should be less than one in a million (1×10^{-6}) or within the risk management range of one in a million (1×10^{-6}) to 100 in a million (1×10^{-4}). Thus, USEPA and CalEPA agencies typically consider risks less than or equal to the 1×10^{-6} risk level to be an insignificant risk, and consider a calculated excess cancer risk between 1×10^{-6} and 1×10^{-4} to be within the risk management range.

Noncancer – The ratio of the estimated CDI of a constituent to the chronic RfD for that constituent is referred to as the noncancer hazard quotient (HQ). Noncancer hazards posed by exposure to multiple noncarcinogenic constituents with similar health effects are assumed to be cumulative. Thus, the total estimated noncancer hazard posed by the presence of several noncarcinogenic constituents in groundwater is calculated as the sum of the hazards estimated for each individual noncarcinogenic chemical. The estimated cumulative noncancer hazard is referred to as the HI. It should be noted that the HQ terms are summed for all constituents independent of the target organ that is affected by the chemical, which is conservative. For noncancer health hazards, an HI of unity (1.0) is identified as the target level of concern; constituent exposures that yield HIs of less than or equal to 1.0 are not expected to result in adverse noncancer health effects (USEPA, 1989).

ES.8.1 Human Health Risk Assessment Results – Well-Specific

Cancer risks and noncancer hazards were estimated for the hypothetical future groundwater user at each individual site groundwater well. COPCs and EPCs of COPCs vary from well-to-well; assumptions for all other inputs to this GWRA are consistent across all wells, including receptors, exposure pathways, groundwater contact rates, exposure frequency and duration, body weight, averaging times, and carcinogenic and noncarcinogenic toxicity values. Where multiple COPCs associated with releases from SWMU 1/AOC 1 were present and were determined to contribute materially to a potentially unacceptable HI at a given well, the target organ and/or critical effect of each of the constituents was evaluated and the implications for interpreting the HIs were provided. It should be noted that all of the estimated cancer risks and noncancer hazards presented in this document are purely hypothetical, estimated under the assumption that in the future someone drills a well onsite[5] and relies on the groundwater as their sole source of water for an entire 30-year period. As there are no current users of the impacted groundwater, the constituents present in the groundwater pose no current cancer risk or noncancer hazard to any current populations. Further, as residential use of any portion of the Study Area, with the *possible* exception of the land owned by USBLM, is unlikely to ever occur, estimated risks and hazards presented in this GWRA are theoretical only, do not correlate to actual anticipated current or future risks, and are used strictly for remedial planning purposes.

Cancer Risk Estimates – Arsenic is the only oral carcinogen present in site groundwater wells; therefore, all estimated potential cancer risks are attributable to this chemical. Arsenic has been detected above background in only three of the 110 groundwater wells at which arsenic was sampled: MW-12, MW-24A, and MW-43-25, with estimated EPCs of 0.11 mg/L, 0.034 mg/L, and 0.024 mg/L, respectively. Two of these locations are barely above the background upper tolerance limit (UTL) of 0.0243 mg/L. For the hypothetical future groundwater user, the estimated well-specific potential cancer risks range from 3.4×10^{-3} to 1.5×10^{-2} across these three wells; the maximum estimated potential cancer risk of 1.5×10^{-2} occurs at well MW-12 located south of Interstate 40 on Federal property leased by CalTrans. For reference, the estimated potential cancer risk associated with exposure to the background concentration of 0.024 mg/L is 3.4×10^{-3}. The estimated potential cancer risks are dominated by the ingestion pathway, which accounts for approximately 99.6% of the total risk, while the dermal contact pathway accounts for only approximately 0.4% of the total risk.

Noncancer Hazards – Estimated well-specific HIs for the most sensitive receptor, the child future hypothetical groundwater user, range from 7.6×10^{-3} to 340 across the 110 groundwater wells with at least one constituent detected above background levels; the threshold HI of 1.0 is exceeded in 87 of these 110

[5] In this context, onsite refers to the Study Area surrounding the Topock Compressor Station.

wells. The estimated noncancer hazard is driven largely by hexavalent chromium, although other constituents also contribute to the estimated noncancer hazard at a very few wells, as described below. The estimated noncancer hazard associated with exposures to hexavalent chromium exceeds the threshold HI of 1.0 for this constituent alone at 62 wells. Hexavalent chromium is the largest contributor to cumulative estimated hazard at nearly all of the wells within the defined hexavalent chromium plume. Other constituents that exceed the threshold HI of 1.0 on an individual-constituent basis in one or more wells are the following: molybdenum (in six wells),vanadium (seven wells), antimony (seven wells), fluoride (five wells), nitrate as nitrogen (one well), arsenic (three wells), barium (two wells), cobalt (two wells), thallium (two wells), cadmium (one well), selenium (one well), and silver (one well). Of these constituents, only molybdenum, nitrate, and selenium were identified as potentially related to releases from SWMU 1/AOC 1 (CH2M HILL, 2009a; CH2M HILL, 2009b). Consistent with USEPA guidance (2007b), both molybdenum and selenium were also evaluated with respect to their essential nutrient status (see Appendix M) as a supplement to the traditional risk evaluation.

Lead – Estimated EPCs for lead in groundwater are compared directly to the CAL for lead of 0.015 mg/L. The well-specific EPC estimated for lead exceeds the CAL in seven of the 36 groundwater wells where lead was detected above the background UTL (frequency of 19%). The highest estimated lead EPC of 0.076 mg/L occurs at MW-22, in the floodplain south of Interstate 40, and is 5.1 times greater than the CAL. The other six wells where the estimated lead EPC exceeds the lead CAL range from 1.1 to 4.9 times greater than the CAL. The estimated well-specific lead EPC exceeds the CAL at locations within and outside of the hexavalent chromium plume, but all wells with lead EPCs exceeding the CAL are located far from the discharge area in the floodplain east of National Trails Highway (also known as Route 66 and Moabi Park Road). Lead was not identified as potentially related to releases from SWMU 1/AOC 1 or SWMU 2 (CH2M HILL, 2009a; CH2M HILL, 2009b).

ES.8.2 Sensitivity Analysis

To understand the implications of using maximum detected concentrations as the estimated EPCs, a sensitivity analysis was conducted using average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects (i.e., where there was insufficient data to calculate a 95% UCL). The results of this sensitivity analysis are discussed below in the results of this GWRA. As discussed with the agencies, the sensitivity analysis provides important information as it allows risk managers to better understand whether estimated risks/hazards are based on limited or robust quantities of data. Although informative to the risk managers, the sensitivity analysis is not used to eliminate COPCs from the GWRA or to reach conclusions as to whether a particular chemical is a COC that should be carried forward to the CMS/FS.

ES.8.3 Discussion of Well-Specific Results

To provide perspective on the significance of constituents detected in groundwater and whether specific constituents may need to be incorporated into the CMS/FS, the constituents included in the well-specific HHRA were separated into five categories based on (1) the frequency with which a constituent is determined to be a material contributor (either individually or cumulatively with other constituents) to elevated estimated cumulative risk or hazard, and (2) the magnitude of contribution to elevated estimated cumulative risk or hazard. To categorize the constituents in this manner, the risks and noncancer hazards estimated at each well were examined individually to determine the risk drivers for that well. The results of the quantitative process used to rank the frequency and magnitude of contribution to estimated cumulative risk or hazard for each constituent are summarized below.

Categorization of Constituents According to Frequency and Magnitude of Contribution to Elevated Estimated Cumulative Noncancer Hazard Index At Individual Wells[1,2]

Cat.	Frequency of Contribution[3]	Magnitude of Contribution[4]	Chemicals in Category	Level of Potential Hazard/Risk
1	Zero	Not applicable	Aluminum, beryllium, copper, mercury, and zinc	None
2	Low	Low	Barium, cadmium, cobalt, nickel, nitrate as nitrogen, selenium, silver, and thallium	Low
3a	Low	Moderate	Fluoride	Low to moderate
3b	Moderate	Low	Lead, molybdenum, and vanadium	
4a	Moderate	Moderate	Antimony	Moderate
4b	Low	High	Arsenic	
5	Moderate	High	Hexavalent chromium	Moderate to high

Notes:

(1) Lead frequency and magnitude of contribution are based on a comparison to the CAL for lead.

(2) Arsenic magnitude of contribution is based on estimated cancer risk. Arsenic is the only oral carcinogenic chemical.

(3) The frequency of contribution is based on the percent of wells in which a constituent is determined to be a material contributor to elevated noncancer hazard. In this section, constituents are grouped into zero (0 percent), low (0 to 5 percent), moderate (5 to 50 percent), and high (greater than 50 percent) frequency of contribution.

(4) The magnitude of contribution is based on the average estimated noncancer hazard index (HI) at the wells in which a constituent is determined to be a material contributor to elevated noncancer hazard. In this section, constituents are grouped into low (average HI between 0.5 and 5), moderate (average HI between 5 and 50), and high (average HI greater than 50) magnitude of contribution.

ES.8.3.1 Categories 1 and 2: No to Low Level of Potential Risk/Hazard

Constituents in Categories 1 and 2 are either consistently detected below target risk thresholds, or were detected at only a very few number of wells (< 5%) at concentrations only slightly above a target risk threshold (HIs of between 0.5 and 5). Based on the frequency and magnitude of the estimated potential noncancer hazards for constituents in Categories 1 or 2, it may be concluded that the following constituents are unlikely to pose adverse health effects to hypothetical future groundwater users: aluminum, barium, beryllium, cadmium, cobalt, copper, mercury, nickel, nitrate as nitrogen, selenium, silver, thallium, and zinc. Accordingly, the results of the risk assessment would support that these constituents are not COCs and, thus, it is recommended that these constituents in Categories 1 and 2 not be carried forward to the CMS/FS.

Although the risk assessment supports that neither selenium nor nitrate as nitrogen represent a significant source of noncancer hazard to future hypothetical groundwater users at the site, the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) concluded that both selenium and nitrate as nitrogen could potentially be related to releases from SWMU 1/AOC 1. Selenium exceeds an HI of 1.0 at only one well: TW-1 on PG&E property south of Interstate 40, with a selenium HI of 2.0. Nitrate as nitrogen exceeds an HI of 1.0 at one well: PT-8M on HNWR property south of Interstate 40 with a nitrate as nitrogen HI of 1.3. Although the risk assessment concludes that these two compounds are not believed to be a source of significant risk/noncancer hazard and, thus, would not be considered COCs, because each exceeds an HI of 1.0 at one well, DTSC has directed PG&E to carry selenium and nitrate as nitrogen forward into the CMS/FS.

ES.8.3.2 Category 3 – Low to Moderate Level of Potential Risk/Hazard

Fluoride – The frequency that fluoride contributes materially to elevated estimated cumulative noncancer hazard in individual wells is low, and the magnitude of the contribution is moderate. Specifically, fluoride is a material contributor to elevated estimated noncancer hazard at five (4.8%) of 104 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to fluoride is 12. It is worth noting, however, that, similar to arsenic, the risk-based concentration (RBC) for fluoride of 0.93 mg/L is actually lower than the background concentrations at the site. Specifically, the mean and UTL fluoride concentrations in the background dataset are 1.4 mg/L and 7.4 mg/L, which would correspond to estimated noncancer HIs of 1.5 and 7.6, respectively.

Lead – The frequency that estimated lead concentrations in individual wells exceed the CAL is moderate, and the magnitude of the exceedances are low. Specifically, lead is estimated to be present in concentrations that exceed the CAL at seven (8.4%) of 83 groundwater wells where it was sampled and analyzed for. At these particular wells, the average ratio of the estimated lead EPC to the lead CAL is 2.7. The results of the sensitivity analysis indicate that lead is estimated to be present in concentrations in excess of the CAL at only two (2.4%) of 83 groundwater wells. If lead EPCs were estimated using the average—

rather than maximum concentrations—at these two wells, the lead EPC exceeds the CAL by factors of 1.1 (MW-22) and 2.5 (MW-30-3). Thus, the sensitivity analysis would suggest that lead is a low hazard, and is unlikely to pose adverse health effects to hypothetical future groundwater users at the site.

Molybdenum – The frequency that molybdenum contributes materially to elevated estimated cumulative noncancer hazard in individual wells is moderate, and the magnitude of the contribution is low. Specifically, molybdenum is a material contributor to elevated estimated noncancer hazard at 17 (20%) of 83 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to molybdenum is 1.1. The estimated HIs for molybdenum exceed the threshold of 1.0 in six wells, ranging from 1.1 to 2.5. The results of the sensitivity analysis indicate that molybdenum would be a material contributor to elevated estimated noncancer hazard at 14 (17%) of 83 groundwater wells, with an average estimated HI of 1.0 if molybdenum EPCs were estimated using the average rather than maximum concentrations.

Vanadium – The frequency that vanadium contributes materially to elevated estimated cumulative noncancer hazard in individual wells is moderate, and the magnitude of the contribution is low. Specifically, vanadium is a material contributor to elevated estimated noncancer hazard at 17 (20%) of 83 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to vanadium is 1.1. The estimated HIs for vanadium exceed the threshold of 1.0 in seven wells, ranging from 1.1 to 2.7. The results of the sensitivity analysis indicate that vanadium would be a material contributor to elevated estimated noncancer hazard at nine (11%) of 83 groundwater wells, with an average estimated HI of 0.87, if vanadium EPCs were based on average rather than maximum concentrations.

Conclusions for Category 3 Constituents – It may be concluded that the level of estimated potential hazard for the future hypothetical groundwater user for the following constituents is low to moderate: fluoride, lead, molybdenum, and vanadium. However, the RFI/RI Volume 2 (CH2M HILL, 2009a) states that with the possible exception of molybdenum, the presence of these constituents does not coincide with historical discharges to the BCW, or the inactive injection well PGE-08. The RFI/RI Volume 2 (CH2M HILL, 2009a) also states that the sampling data generally suggest either natural elevated concentrations or localized, anomalous detections as the explanation for the presence of these constituents in groundwater. Accordingly, the following Category 3 constituents are not COCs and, thus, it is recommended that they not be carried forward to the CMS/FS: fluoride, lead, and vanadium.

The potential for molybdenum to be associated with SWMU 1/AOC 1 in groundwater cannot be ruled out at this time, and molybdenum is present in a moderate number of wells (i.e., greater than 5%, but not more than 20%). Reported molybdenum concentrations are estimated to slightly exceed the target HI of 1.0 at six wells, with an estimated HI range of 1.1 to 2.5 for molybdenum. A supplemental evaluation of molybdenum is presented to more fully explore the uncertainties associated with the estimated noncancer hazards calculated for molybdenum, and provide the risk managers with a more in-depth evaluation of the weight of

the evidence with respect to the presence and potential future health hazards associated with the molybdenum. The aspects of the molybdenum analysis that were evaluated in more depth are:

- The contributions to cumulative hazard estimates for molybdenum, when considering only those other constituents that are related to SWMU 1/AOC 1 (i.e., hexavalent chromium, selenium, and nitrate as nitrogen), and the target organs that could potentially be affected by these constituents.

- The relationship of the toxicity value for molybdenum (i.e., the RfD) to essential nutrient information and the associated contribution to potential health impacts in accordance with USEPA Framework for Metals Risk Assessment (2007b).

Particularly compelling in these additional evaluations is the toxicological and nutritional information, which strongly supports that the toxicity information relied upon in estimating the noncancer HIs for molybdenum is outdated, and not reflective of current agency-recommended approaches (USEPA, 2007b) for integrating essential nutrient information into the risk assessment process. The evaluation of molybdenum with respect to health protective nutritional intake information indicates that there is only one well out of 83 (1.2% of wells) that slightly exceeds health protective criteria. That one well exceeds by roughly 10%, which would equate to an "HI" equivalent of 1.1, even when one assumes molybdenum intake from both groundwater and diet. In sum, these additional evaluations strongly suggest that molybdenum is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water. Accordingly, the results of the risk assessment support that molybdenum is not a COC and, thus, does not need to be carried forward to the CMS/FS.

Although the risk assessment supports that molybdenum is unlikely to represent a significant source of noncancer hazard to future hypothetical groundwater users at the site, the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) concluded that molybdenum could potentially be related to releases from SWMU 1/AOC 1. Although the risk assessment concludes that molybdenum is not believed to be a source of significant risk/noncancer hazard and, thus, would not be considered a COC, but because it exceeds an HI of 1.0 at more than one well, DTSC has directed PG&E to carry molybdenum forward into the CMS/FS.

ES.8.3.3 Category 4 – Moderate Level of Potential Risk/Hazard

Antimony – The frequency that antimony contributes materially to elevated estimated noncancer hazard in individual wells is moderate, and the magnitude of the contribution is moderate. Specifically, antimony is a material contributor to elevated estimated noncancer hazard at seven (10%) of 68 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to antimony is 9.6. The estimated HIs for antimony exceed the threshold of 1.0 in seven wells, ranging from 1.4 to 25. Antimony was detected in only one or two samples at each of the seven wells where antimony contributes

materially to elevated noncancer hazard, suggesting that the presence of antimony, both across the site and at individual wells, is sporadic and inconsistent. The results of this sensitivity analysis indicate that antimony would be a material contributor to elevated noncancer hazard at three (4.4%) of 68 groundwater wells, with an average estimated HI of 7.9 if antimony EPCs were based on average rather than maximum concentrations. Using the results of the sensitivity analysis would result in a change in category for antimony from a moderate potential hazard to a low-to-moderate potential hazard.

Arsenic – Arsenic has been detected above background in only three (2.7%) of the 110 groundwater wells for which arsenic was sampled: MW-12, MW-24A, and MW-43-25. Arsenic has been detected at low frequency at the site, at concentrations resulting in potential estimated risks that are high (ranging from 3.4×10^{-3} to 1.5×10^{-2}) relative to the cancer risk management range. However, the background estimated risk level for arsenic is also greater than the upper end of the risk management range at 3.4×10^{-3}. It should be noted, however, that arsenic exceedances of background are limited to two locations at concentrations that are only slightly above background (i.e., at two locations where concentrations are 1.01 and 1.4 times above background), and one location (MW-12) where concentrations are roughly 5 times above background. Accordingly, the level of estimated potential risk for arsenic is moderate at one well (MW-12) for the future hypothetical groundwater user.

Conclusions for Category 4 Constituents – It may be concluded that the level of estimated potential risk/hazard for the following constituents is moderate for the hypothetical future groundwater user: arsenic and antimony. Although the quantitative estimates of noncancer hazard and cancer risk to a future hypothetical groundwater user indicate that these constituents are considered a moderate potential risk/hazard, exceedances are discontinuous and do not coincide with the historical discharges to the BCW, the inactive injection well PGE-8, or with other site-related sources. The sampling data generally suggest a non-PG&E source, natural elevated concentrations, or localized anomalous detections. Based on the discontinuous distribution or localized occurrence, and the lack of identifiable sources or association with facility operations, the RFI/RI Volume 2 (CH2M HILL, 2009a) concludes that arsenic and antimony are not COPCs in groundwater related to SWMU 1/AOC 1 or SWMU 2. Accordingly, antimony and arsenic are not COCs and, thus, it is recommended that these chemicals not be carried forward to the CMS/FS.

ES.8.3.4 Category 5 – Moderate to High Level of Potential Risk/Hazard

Hexavalent Chromium – Hexavalent chromium is a material contributor to elevated noncancer hazard at 65 (39%) of 167 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to hexavalent chromium is 66. Therefore, it may be concluded that the frequency that hexavalent chromium contributes materially to elevated estimated noncancer hazard is moderate, and the magnitude of the contribution is high. These results did not change substantially with the use of average estimated EPCs in the sensitivity analysis. Hexavalent chromium was detected on a site-wide basis in 1,650 (59%) of 2,780 samples analyzed for hexavalent chromium and was detected above

background levels in 69 (41%) of the 167 wells sampled for hexavalent chromium. This site-wide analysis further supports the conclusion that hexavalent chromium has been detected at moderate frequency at the site at levels that exceed the target noncancer threshold.

ES.8.3.5 Summary of Constituents of Concern

COCs are defined as those COPCs that are (1) determined to be present in site groundwater at levels of potential concern to future human health or the environment, and (2) may be associated with groundwater at SWMU 1/AOC 1 or SWMU 2. The COCs are recommended to be carried forward to the CMS/FS for risk management considerations.

As presented in this GWRA, there are a total of seven constituents that were detected in groundwater at concentrations that could pose a potential risk/hazard to future hypothetical groundwater users: fluoride, lead, molybdenum, and vanadium are estimated to be a low to moderate potential risk/hazard; arsenic and antimony are estimated to be a moderate potential risk/hazard; and hexavalent chromium is estimated to be a moderate to high potential risk/hazard. As detailed in the RFI/RI Volume 2 (CH2M HILL, 2009a), the weight of the evidence supports that, of these seven constituents, only hexavalent chromium and, potentially, molybdenum are considered to be associated with SWMU 1/AOC 1.

Additional detailed evaluations of molybdenum were conducted to more fully explore the uncertainties associated with the estimated noncancer hazards calculated for molybdenum, and provide the risk managers with a more in-depth evaluation of the weight of the evidence with respect to the presence and potential future health hazards associated with the molybdenum. This molybdenum essential nutrient evaluation, conducted in addition to the standard baseline molybdenum evaluation, is not a typical component of DTSC's standard risk assessment protocols, although an essential nutrient screen is not an unusual request for USDOI sites. Incorporating more recent toxicological information for molybdenum and integrating essential nutrient information into the risk assessment process indicates that there is only one well (1.2% of total wells) that slightly exceeds health protective criteria for molybdenum (exceeding by roughly 10%, which would equate to an "HI" equivalent of 1.1). This supplemental evaluation of molybdenum assumes molybdenum intake from both groundwater and diet. These additional toxicological evaluations strongly suggest that molybdenum is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water.

In sum, based on the results of this GWRA analysis and the identification of the constituents believed to be associated with SWMU 1/AOC 1, as presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b), hexavalent chromium is the only COC. Accordingly, it is recommended that the COC, hexavalent chromium, be carried forward to the CMS/FS.

The three other COPCs identified in the RFI/RI Volume 2 and Addendum (CH2M HILL, 2009a,b) as potentially associated with SWMU 1/AOC 1, selenium, nitrate as nitrogen, and molybdenum, were thoroughly evaluated in this GWRA. As described in earlier sections, the weight of the evidence for these three compounds suggests that they would not be expected to pose significant noncancer hazard to future hypothetical groundwater users at the site and, thus, are not COCs. Although the risk assessment concludes that these three compounds are not believed to be a source of significant risk/noncancer hazard and, thus, would not be considered COCs, because each exceeds an HI of 1.0 at one or more wells, DTSC has directed PG&E to carry selenium, nitrate as nitrogen, and molybdenum forward into the CMS/FS.

Based on the results of the groundwater-to-surface water transport analysis presented in this GWRA, it is concluded that the potential transport of constituents in groundwater to the Colorado River represents an insignificant transport pathway: floodplain COPCs are not being transported to the Colorado River at concentrations that exceed screening-level surface water criteria. Accordingly, it may be concluded that quantitative surface water human health and ecological risk assessments are not warranted, and there are no COCs related to the surface water pathway.

ES.9 Risk-Based Remediation Goals/Applicable Drinking Water Criteria

As discussed above, based on the results of the risk assessment, hexavalent chromium is the only COC[6]. Although there is no maximum contaminant level (MCL) specific to hexavalent chromium, hexavalent chromium is regulated under the MCL for total chromium (i.e., 50 µg/L), which is considered safe for human consumption. In addition to the MCL, an RBC of 46 µg/L was calculated for hexavalent chromium using the same exposure and toxicity assumptions as used in the risk estimate above. The California MCL and the RBC for hexavalent chromium, which are very comparable, are slightly greater than the background UTL for hexavalent chromium of 32 µg/L. The MCL, RBC, and the background concentration of hexavalent chromium represent the range of potential remedial goals that may be considered in the upcoming CMS/FS.

ES.10 Conclusions and Recommendations

This comprehensive GWRA was conducted, in accordance with the agency-approved RAWP (ARCADIS, 2008) and RAWP Addendum (ARCADIS, 2009) and additional comments received from DTSC's HERD and USDOI, in order to provide information about potential health threats and ecological risks posed by groundwater impacted by chemical releases from SWMU 1/AOC 1 and SWMU 2 and to assist risk

[6] Although hexavalent chromium is the only chemical that is defined as a COC (the only chemical that poses both a potentially significant risk/noncancer hazard and is potentially associated with releases from SWMU 1/AOC 1), at DTSC's direction the other potential facility-related COPCs (i.e., selenium, nitrate as nitrogen, and molybdenum) will be carried forward to the CMS/FS.

management decision making (USEPA, 1989; USEPA, 1997a). The GWRA combines the quantitative estimates of risk with the findings of the RFI/RI Volume 2 and RFI/RI Volume 2 Addendum (CH2M HILL, 2009a,b) and recommends a final list of compounds, COCs, to be carried forward to the CMS/FS. Specifically, COCs are defined as those COPCs that are (1) determined to be present in site groundwater at levels of potential concern to future human health or the environment, and (2) likely associated with groundwater at SWMU 1/AOC 1 or SWMU 2. The COCs represent those constituents that are recommended to be carried forward to the CMS/FS for risk management considerations.

The key conclusions and recommendations of this GWRA were conservatively based on estimates of potential future risk/noncancer hazard at each individual monitoring well and are summarized as follows:

- The potential transport of constituents in groundwater to the Colorado River represents an insignificant transport pathway: floodplain COPCs are not being transported to the Colorado River at concentrations that exceed screening-level surface water criteria. Accordingly, it may be concluded that quantitative surface water human health and ecological risk assessments are not warranted.

- Because there is no current direct or indirect complete exposure pathway for contact with impacted site groundwater, there is no human population currently at risk of adverse health effects due to the presence of hexavalent chromium in the groundwater.

- Because there is no significant ecological exposure pathway for contact with impacted site groundwater, there are no ecological receptors currently at risk of adverse effects due to the presence of COPCs in the groundwater.

- The following COPCs are either consistently detected at individual wells below target risk thresholds, or were detected infrequently at individual wells at concentrations only slightly above a target risk threshold: aluminum, barium, beryllium, cadmium, cobalt, copper, mercury, nickel, nitrate as nitrogen, selenium, silver, thallium, and zinc. Accordingly, as these compounds do not represent significant sources of potential future risk/noncancer hazard, the risk assessment would support that these constituents are not COCs and, thus, it is recommended that these constituents not be carried forward to the CMS/FS.

- There are a total of seven COPCs that were detected in groundwater at individual wells at concentrations that were calculated to potentially pose a risk/hazard to future hypothetical groundwater users:

  - Fluoride, lead, molybdenum, and vanadium are estimated to be a low to moderate potential risk/hazard.
  - Arsenic and antimony are estimated to be a moderate potential risk/hazard.
  - Hexavalent chromium is estimated to be a moderate to high potential risk/hazard.

- As detailed in the RFI/RI Volume 2 (CH2M HILL, 2009a), the weight of the evidence supports that, of these seven constituents that could potentially pose a risk/hazard to future hypothetical groundwater users, only hexavalent chromium and, potentially, molybdenum are considered to be associated with SWMU 1/AOC 1.

- The RFI/RI Volume 2 (CH2M HILL, 2009a) states that the presence of fluoride, lead, vanadium, antimony, and arsenic does not coincide with historical discharges to the BCW, the inactive injection well PGE-8, or other identifiable sources. The RFI/RI Volume 2 also states that the sampling data generally suggest either natural elevated concentrations or localized, anomalous detections as the explanation for the presence of these constituents in groundwater. Accordingly, it is recommended that the following COPCs not be carried forward to the CMS/FS: fluoride, lead, vanadium, antimony, and arsenic.

- Additional detailed evaluations of molybdenum were conducted to more fully explore the uncertainties associated with the estimated noncancer hazards calculated for molybdenum, and provide the risk managers with a more in-depth evaluation of the weight of the evidence with respect to the presence and potential future health hazards associated with the molybdenum. Incorporating more recent toxicological information and agency-recommended approaches (USEPA, 2007b) for integrating essential nutrient information into the risk assessment process suggests that that molybdenum is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water. Accordingly, the results of the risk assessment would support that molybdenum is not a COC and does not need to be carried forward to the CMS/FS.

- Hexavalent chromium is present at concentrations that could pose a potential hazard to the future hypothetical groundwater user, if the groundwater were in the future to be used as a potable source of water. Based the on the results of the risk estimates, and the fact that the presence of hexavalent chromium is related to historical releases from SWMU 1/AOC 1, hexavalent chromium is the only COC. Accordingly, it is recommended that the COC hexavalent chromium be carried forward to the CMS/FS.

- In addition to hexavalent chromium, the RFI/RI Volume 2 and RFI/FI Volume 2 Addendum (CH2M HILL, 2009a,b) identified three other COPCs as potentially associated with SWMU 1/AOC 1: selenium, nitrate as nitrogen, and molybdenum. Selenium, nitrate as nitrogen, and molybdenum were thoroughly evaluated in this GWRA. As described in earlier sections, the weight of the evidence for these three compounds suggests that they would not be expected to pose a significant risk/noncancer hazard to future hypothetical groundwater users at the site. Although the risk assessment concludes that these three compounds are not believed to be a source of significant risk/noncancer hazard and, thus, would not be considered COCs, because each exceeds an HI of 1.0 at one or more wells, DTSC has directed PG&E to carry selenium, nitrate as nitrogen, and molybdenum forward into the CMS/FS.

1. Introduction

This Groundwater Human Health and Ecological Risk Assessment (GWRA) describes the potential risks to human health and ecological receptors associated with groundwater impacted by activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2 of the Pacific Gas and Electric Company (PG&E) Topock Compressor Station. PG&E is conducting investigative and remedial activities at the site, including this GWRA, pursuant to the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The approach, methods, and assumption used in this GWRA are consistent with the Risk Assessment Work Plan (RAWP) (ARCADIS, 2008), and RAWP Addendum (ARCADIS, 2009) reviewed and approved by the California Department of Environmental Protection (CalEPA) Department of Toxic Substances Control (DTSC) and the U.S. Department of the Interior (USDOI) (CalEPA, 2009; USDOI, 2009).

The site is located in eastern San Bernardino County, approximately 15 miles southeast of Needles, California (Figure 1-1). The compressor station occupies approximately 15 acres of a 65-acre parcel of PG&E-owned land. However, the Study Area[1] for investigative and remedial activities covers additional surrounding land owned and/or managed by a number of government agencies including the U.S. Bureau of Land Management (USBLM), U.S. Bureau of Reclamation (USBOR), U.S. Fish and Wildlife Service (USFWS), and San Bernardino County, as well as California Department of Transportation, and Burlington Northern Santa Fe (BNSF) Railroad (Figure 1-2).

The nearest communities are mobile home parks at Topock, Arizona, and Moabi Regional Park, California, as shown in Figure 1-3. Topock is located on the Arizona (or eastern) side of the Colorado River, about 0.5 mile east-northeast of the compressor station. Moabi Regional Park is located on the California (or western) side of the Colorado River about one mile northwest of the compressor station. The community of Golden Shores, Arizona, the largest nearby community, is located approximately five miles north of the compressor station on the east side of the Colorado River.

A complete description of the site background can be found in the *Revised Final RCRA Facility Investigation/Remedial Investigation Report, Volume 1 – Site Background and History* (Revised Final RFI/RI Volume 1; CH2M HILL, 2007a).

1.1 Objectives and Overview

The general purpose of this GWRA is to provide information about potential health threats and ecological risks posed by groundwater impacted by chemicals releases from SWMU 1/AOC 1 and SWMU 2 and to assist risk management decision making (USEPA, 1989; USEPA, 1997a). In accordance with the RAWP (ARCADIS, 2008), specific objectives within that overall purpose include: (1) helping to determine the need for remedial action with respect to groundwater conditions; (2) providing a basis for determining levels of

constituents that can remain in groundwater at the site and still adequately protect public health (USEPA, 1989), and (3) identify complete and significant exposure pathways, if any, from groundwater to the Colorado River. The latter objective will identify complete and significant exposure pathways, if any, from groundwater to ecological receptors contacting the river, thereby completing the groundwater-related elements of a scoping-level ecological risk assessment, consistent with California Environmental Protection Agency (CalEPA) ecological risk assessment guidance (CalEPA, 1996a).

Figure 1-4 shows how the GWRA fits into the various regulatory steps being followed for the Topock project. These steps are consistent with both CERCLA and RCRA regulatory programs. Information and sampling data collected for the site and reported in the RFI/RI documents form the basis of information utilized in the GWRA described in this document and the upcoming Soil Risk Assessment. As shown, the ultimate goal of the process is the remediation of the soil and groundwater as needed to protect the public health and environment.

As defined by the Revised Final RFI/RI Volume 1, the SWMUs and AOCs addressed in the *RCRA Facility Investigation/Remedial Investigation Report, Volume 2 – Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation* (RFI/RI Volume 2; CH2M HILL, 2009a) and this GWRA are those associated with the historical discharge of wastewater from two SWMUs at the facility. These include:

- SWMU 1/AOC 1 – former percolation bed and area around former percolation bed
- SWMU 2 – Inactive Injection Well PGE-08.

The RFI/RI Volume 2 and the *RCRA Facility Investigation/Remedial Investigation Report, Volume 2 Addendum: Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigations* (RFI/RI Volume 2 Addendum; CH2M HILL, 2008a)[2] summarizes the groundwater characterization to date and provides recommended groundwater constituents of potential concern (COPCs) associated with SWMU 1/AOC 1 that should be carried forward to carry into the Corrective Measures Study/Feasibility Study (CMS/FS) (CH2M HILL, 2009a), pending the results of the GWRA. Based on site history and characterization data, the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) identified total chromium, hexavalent chromium, molybdenum, nitrogen as nitrate, and selenium in groundwater as the COPCs associated with SWMU 1/AOC 1 to be carried forward to the CMS/FS, pending the completion and recommendations of the GWRA. The RFI/RI Volume 2 (CH2M HILL, 2009a) recommends that SWMU 2 (the inactive injection well PGE-08) be closed with the RFI/RI and not be carried forward into the CMS/FS.

This GWRA evaluates all constituents detected in the groundwater, as presented in the RFI/RI Volume 2 and RFI/RI Volume 2 Addendum (CH2M HILL, 2009a,b)[2], and identifies constituents that could pose an unacceptable risk to either human health or the ecological environment. Constituents are evaluated in the

GWRA, even if the RFI/RI Volume 2 concludes that the constituents are not related to SWMU 1/AOC 1 or SWMU 2 (CH2M HILL, 2009a). The GWRA combines the quantitative estimates of risk with the findings of the RFI/RI Volume 2 and recommends a final list of compounds, referred to as Constituents of Concern (COCs) to be carried forward to the CMS/FS.

1.2 Regulatory Framework

Consistent with the RFI/RI requirements, the typical RCRA/CERCLA process, and the specific agency requirements for this site, this GWRA is being completed in order to finalize the list of constituents in groundwater that are related to the discharge from SWMU 1/AOC 1and SWMU 2 that should be carried forward to the CMS/FS, as stated above.

The CalEPA Department of Toxic Substances Control (DTSC) is the lead state agency charged with directing remedial and investigative activities at the site in accordance with federal RCRA. In February 1996, PG&E and DTSC entered into a Corrective Action Consent Agreement (CACA) pursuant to Section 25187 of the California Health and Safety Code (CalEPA, 1996b). Under the terms of the CACA, PG&E agreed to conduct an RFI to identify and evaluate the nature and extent of hazardous waste and constituent releases at the site. This GWRA complements the recently approved RFI/RI Volume 2 (CH2M HILL, 2009a) and is the final element of the RFI process for the media and SWMUs/AOCs addressed in the RFI/RI Volume 2, namely, the former percolation bed in Bat Cave Wash (BCW; SWMU 1/AOC 1) and the inactive injection well PGE-08 (SWMU-2).

The U.S. Department of the Interior (USDOI) is the lead federal agency on land under its jurisdiction, custody, or control and is responsible for oversight of response actions being conducted by PG&E pursuant to the 1980 CERCLA. Portions of the site affected by operations at the compressor station are on land managed by the USBLM, USFWS, and USBOR (collectively the “federal agencies”). In July 2005, PG&E and the federal agencies entered into an Administrative Consent Agreement (USDOI, 2005) to implement response actions at the site as set forth in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300).

1.3 Organization of Risk Assessment Report

The remainder of this report is organized as follows:

- **Section 2: Site History and Characteristics** – This section describes the historical operations, previous and ongoing investigations, and physical characteristics of the site.

- **Section 3: Summary of Investigations and Analytical Results** – This section describes the available dataset for groundwater and surface water and the steps taken in determining the usability of the data for risk assessment purposes.

- **Section 4: Identification of Constituents of Potential Concern** – This section describes the steps taken in selecting constituents that are of concern to human and/or ecological receptors that will be included in the quantitative risk assessment.

- **Section 5: Exposure Assessment** – This section describes the conceptual site model (CSM) of applicable exposure pathways and the process of calculating exposure point concentrations (EPCs) for use in estimating representative exposure concentrations.

- **Section 6: Toxicity Assessment for Human Health** – This section describes cancer and non-cancer toxicity values used in the quantitative risk assessment.

- **Section 7: Risk Characterization** – This section describes the potential for adverse impacts on human health or the ecological environment to result from the projected exposures.

- **Section 8: Risk-Based Remediation Goals/Applicable Drinking Water Criteria** – This section describes the risk-based remedial goals and applicable drinking water criteria for those constituents that are recommended to be carried forward to the CMS/FS.

- **Section 9: Uncertainties** – This section describes the key uncertainties associated with the risk assessment process.

- **Section 10: Conclusions and Recommendations** – This section presents the key conclusions of the GWRA and the recommendations regarding those constituents that should be carried forward to the CMS/FS.

- **Section 11: References** – This section provides the references for documents relied upon in the preparation of this GWRA.

Supplemental information is included in the following appendices:

- **Appendix A: Groundwater Data Summary** – This appendix contains the detailed analytical results for the site groundwater.

- **Appendix B: Surface Water Data Summary** – This appendix contains the detailed analytical results for the site surface water.

- **Appendix C: Surface Water Data Summary – Metropolitan Water District of Southern California (MWD)** – This appendix provides surface water monitoring data collected by MWD during 2003 and from August 2007 and July 2008.

- **Appendix D: Evaluation of Other Chemicals** – This appendix presents a screening-level evaluation of specific chemicals that have been detected in groundwater or surface water.

- **Appendix E: Data Usability Matrix** – This appendix summarizes key statistics relating to the usability of the groundwater data used in the GWRA.

- **Appendix F: ProUCL 4.0 Output Reports** – This appendix contains the ProUCL 4.0 output reports for calculation of 95% upper confidence limits (UCLs).

- **Appendix G: Groundwater Risk Assessment Sensitivity Analysis** – This appendix documents a sensitivity analysis of the groundwater human health risk assessment.

- **Appendix H: Human Health and Ecological Surface Water Criteria –** This appendix provides copies of Tables 5-1 and 7-1 from the RAWP (ARCADIS, 2008).

- **Appendix I: Supplemental Ecological Risk Evaluation to Address HERD Comments dated March 26, 2009, June 17, 2009, and September 10, 2009** – This appendix responds to agency comments on the draft GWRA (February 2009) and evaluates three additional potential exposure pathways for ecological receptors: (1) shallow-rooted wetland plant exposure to chemicals in groundwater via root uptake; (2) deep-rooted phreatophyte exposure to chemicals in first encountered groundwater via root uptake; (3) transfer of nitrate in groundwater to plant foliage via root uptake and translocation, then potential ingestion of nitrate in plant tissue by ruminants, specifically the desert bighorn sheep *(Ovis canadensis nelsoni*).

- **Appendix J: Conceptual Site Models** – This appendix provides copies of Figures 4-2 and 4-3 from the RAWP (ARCADIS, 2008).

- **Appendix K: Evaluation of Secondary Exposure Pathways** – This appendix documents an analysis of potential secondary human exposure pathways, conducted per the request of USDOI.

- **Appendix L: Groundwater Chronic Daily Intakes (CDIs)** – This appendix provides well-specific CDIs for carcinogenic and noncarcinogenic effects.

- **Appendix M: Supplemental Evaluation to Address Nutritional Essentiality: Molybdenum and Selenium** – This appendix is a supplemental evaluation of potential hazards associated with potential exposure to the essential nutrients, molybdenum and selenium, for the future hypothetical groundwater user for the site.

- **Appendix N: Target Organs Impacted by Selenium, Nitrate, Molybdenum, and Hexavalent Chromium** – This appendix summarizes the critical target organs that are potentially impacted by exposure to selenium, nitrate, molybdenum and hexavalent chromium.

- **Appendix O: Estimated Potential Cancer Risks and Noncancer Hazard Indices – Hypothetical Future Groundwater User** – This appendix documents the estimated potential cancer risk and noncancer hazard indices for the hypothetical future groundwater user on a well-specific basis.

- **Appendix P: Determination of Material Contributors to Elevated Cumulative Noncancer Hazard at Individual Groundwater Wells** – This appendix documents the methodologies used to characterize the significance of chemical-specific contributions to elevated cumulative hazard at individual wells and lead impacts at individual wells. The appendix also identifies, for each chemical, those specific groundwater wells where the chemical is determined to contribute materially to elevated noncancer hazard, and provides additional discussion and analysis of those specific wells to help evaluate the overall impact of the chemical on site groundwater.

- **Appendix Q: Risk-Based Concentrations of Constituents of Potential Concern in Groundwater** – This appendix presents the calculated risk-based concentrations (RBCs) for all COPCs in the GWRA.

- **Appendix R: Contributions of SWMU 1/AOC 1 Constituents of Potential Concern to Elevated Cumulative Noncancer Hazard** – This appendix presents an analysis of the contributions of the COPCs to estimated potential cumulative noncancer hazard at individual wells, considering only the COPCs that are potentially associated with SWMU 1/AOC 1: selenium, nitrate as nitrogen, molybdenum, and hexavalent chromium.

- **Appendix S: Responses to Stakeholder Comments and Comment Resolution** – This appendix documents official stakeholder comments, supplemental comments, and corresponding responses on the draft GWRA (February 2009).

2. Site History and Characteristics

This section presents information on the physical and ecological characteristics of the Study Area obtained from the *Final Programmatic Biological Assessment* (PBA; CH2M HILL, 2007b). This section also presents a discussion of historical and current operations at the site as well as previous and ongoing environmental investigations. The site history information was obtained from the Revised Final RFI/RI Volume 1 (CH2M HILL, 2007a). The summary of previous and ongoing investigations was obtained primarily from the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b).

2.1 Site Physical Characteristics

The Study Area is located in the Mohave Valley, along the California-Arizona border in eastern San Bernardino County, California. The Chemehuevi Mountains are located to the south and the Colorado River is located to the east and north. The Study Area occupies approximately three square miles of the north-sloping piedmont alluvial terrace and floodplain along the northern margin of the mountains. The following sections contain a brief description of the Study Area physical characteristics, and a detailed description of the site geology and hydrogeology can be found in the Revised Final RFI/RI Volume 2 (CH2M HILL, 2009a).

2.1.1 Geology

Alluvial terraces and incised drainage channels characterize the landforms. BCW is a prominent desert wash in this area that crosses the Study Area from south to north. Floodplains lie adjacent on each side of the Colorado River. The floodplains no longer flood due to upstream dams and flow regulation. On the Study Area side of the river, the floodplain is approximately 500 feet in width. Topography across the Study Area ranges from 450 feet above mean sea level to 1,200 feet mean sea level within a mile of the Colorado River (Figure 2-1).

The compressor station and Study Area are in the Basin and Range geomorphic province, with parallel fault-block mountains separated by alluvial valleys. The Chemehuevi Mountains are the dominant geologic feature in the site vicinity, a metamorphic and plutonic basement core complex exposed in southeastern California and western Arizona. A prominent geologic structural feature is a Miocene-age, low-angle normal fault that forms the northern boundary of the mountains. The site lies on the north-sloping piedmont terrace along the northern margin of the mountains (Figure 2-2).

In the floodplain area, the unconsolidated alluvial and fluvial deposits are underlain by the Miocene conglomerate and pre-Tertiary metamorphic and igneous bedrock. In the upland area, the subsurface shallow aquifer zone consists of alluvial deposits. The saturated thickness of the alluvial aquifer ranges from less than 30 feet in the southern floodplain to 260 feet in the interim measure (IM) injection area, and to more

than 350 feet in the northern floodplain. The most prominent geologic structural feature in the Study Area is the detachment fault that forms the northern boundary of the Chemehuevi Mountains.

2.1.2 Hydrology and Hydrogeology

The site is located within the Sonoran Desert region of the Basin and Range geomorphic province and is situated at the southern end of the Mojave groundwater basin (Anderson, 1995; Anderson et al., 1992). The mountains are roughly parallel north/south and separated by alluvial basins. The Colorado River runs north to south through the basin. The site is located at the southern extent of unconsolidated alluvial aquifer material in the Mohave groundwater basin. The hydrogeologic features of the site and surrounding area are shown on Figure 2-3.

Groundwater occurs under unconfined to semi-confined conditions within the alluvial fan and fluvial sediments beneath most of the site. The saturated portion of the alluvial fan and fluvial sediments are collectively referred as the alluvial aquifer. In the floodplain area adjacent to the Colorado River, the fluvial deposits interfinger with, and are hydraulically connected to, the alluvial fan deposits. The unconsolidated alluvial and fluvial deposits are underlain by the Miocene Conglomerate and pre-Tertiary metamorphic and igneous bedrock with very low permeability; therefore, groundwater movement occurs primarily in the overlying unconsolidated deposits.

Water chemistry is generally dominated by sodium and chloride, and total dissolved solids (TDS) vary considerably. Under natural conditions, groundwater flows from west/southwest to east/northeast across the site. Natural groundwater flow directions across most of the site are generally upward and toward the floodplain. IM-3 pumping creates localized flow in the direction of the extraction wells, such that in the floodplain, groundwater moves toward the extraction wells and away from the river.

2.2 Ecological Characteristics

The site is located adjacent to the 37,515-acre Havasu National Wildlife Refuge (HNWR) managed by USFWS. The area is characterized by arid conditions and high temperatures and consists of a series of terraces divided by dry desert washes (CH2M HILL, 2005a). The Study Area is located either within the Mojave Desert province of California, the Colorado Desert, or the boundary between these two deserts (CH2M HILL, 2005a). The following sections provide a general overview of the ecological characteristics for upland and riparian habitats (vegetation communities are shown on Figure 2-4). Much of this information has been excerpted from the Revised Final RFI/RI Volume 1 (CH2M HILL, 2007a) and the PBA (CH2M HILL, 2007b). These documents should be consulted for detailed information. The primary source of information on ecological habitat characteristics, the PBA (CH2M HILL, 2007b), is described briefly below.

2.2.1 Programmatic Biological Assessment

The PBA (CH2M HILL, 2007b) was prepared to evaluate potential effect on species protected under the federal Endangered Species Act resulting from past, present, or planned remedial and investigative activities up to the selection and implementation of the final remedy. The primary purpose of the PBA was to put into context the status and management of Endangered Species Act species within or near the Area of Potential Effect (APE) and to better evaluate the effects of current and future proposed activities on those species and habitats. The APE was defined in the PBA as the area that potentially may be affected by the RFI/RI activities and is shown on Figure 2-4. Based on the information provided in the PBA, the upland and riparian habitats are described below.

2.2.2 Uplands

Upland areas of the APE include the HNWR, which was established to protect and conserve wildlife. The terrestrial habitats are typical of Mojave Desert uplands, consisting of creosote bush scrub, Mojave Wash, desert riparian, and tamarisk thicket (vegetation communities are shown on Figure 2-4). Creosote bush scrub is the dominant upland plant community (CH2M HILL, 2007b). The area is vegetated with widely distributed creosote bushes (*Larrea tridentata*). The creosote bush and salt bush scrub plant communities comprise approximately 974 acres within the APE. Terrestrial wildlife found at the site is adapted to the desert habitats found at the site. Adjacent natural barriers such as the Chemehuevi Mountains and Colorado River interrupt a continuous terrestrial wildlife corridor for some species. Representative upland avian, mammalian, and reptilian species are listed in Table 2-1. Representative upland plant species are listed in Table 2-2.

The BCW is an ephemeral drainage that extends from the Chemehuevi Mountains to the Colorado River approximately 3,500 feet north of the compressor station. It is located west of the Colorado River, in the Mojave Wash habitat. This wash may periodically flood during stormwater runoff events, but remains dry throughout most of the year due to arid desert conditions. BCW consists of areas of sand, gravel, and cobblestone substrate interspersed with widely spaced desert wash vegetation including mesquite and creosote (CH2M HILL, 2007b).

2.2.3 Riparian Corridor

The Colorado River is the primary aquatic habitat located approximately 1,300 feet east of the compressor station. The river is approximately 700 to 900 feet wide and 8 to 15 feet deep at this location (E&E, 2000). Small patches of emergent vegetation, such as common reed (*Phragmites communis*), cattails (*Typha* sp.), sedges (*Carex* sp.), and bulrush (*Scirpus* sp.), exist along the banks of the Colorado River, with little to no submergent vegetation within the river. The Topock Marsh, extending northeast of the APE within the HNWR, provides important aquatic marsh and riparian habitat in the local vicinity. East of the Colorado

River, the APE is a sand and salt cedar environment very similar to that found of the floodplain on the California side (Figure 2-4). Salt cedar (also referred to as tamarisk) thicket is the dominant plant community along the Colorado River floodplain. This invasive, exotic plant species has displaced native plant species. This plant community consists of dense thickets of tamarisk or salt cedar (*Tamarix* sp.) sometimes surrounded by arrowweed (*Pluchea sericea*) at the edges. Salt cedar is highly successful in arid climates with saline or alkaline soils and often occurs in monotypic stands in riparian areas. The salt cedar and arrowweed plant communities compose approximately 349 acres within the APE. Various wildlife and plant species are supported by the riparian habitat and representative species lists are presented in Tables 2-3 and 2-4.

2.2.4 Special-Status Species

Several threatened or endangered species (state and federally listed) were identified as having potential to occur on or near the site. These species were evaluated in the PBA (CH2M HILL, 2007b). The PBA concluded a critical habitat effect determination of "no effect" for all but one special-status species evaluated. The "no effect" species are southwestern willow flycatcher (*Empidonax traillii extimus*), Mojave desert tortoise (*Gopherus agassizii*), Yuma clapper rail (*Rallus longirostris yumanensis)*, Colorado pikeminnow (*Ptychocheilus lucius*), and razorback sucker (*Xyrauchen texanus)*. One species, bonytail chub (*Gila elegans)*, was concluded to have a critical habitat effect determination of "may affect, but not likely to adversely affect."

There are no state or federally listed threatened or endangered plant species potentially present in the riparian areas. In uplands, smoke tree (*Psorothamnus spinosus*) is potentially present and is an Arizona state protected species.

2.3 Land Use

The following sections describe the current uses of the site and the surrounding areas, as well as the reasonably anticipated future land uses.

2.3.1 Current Land Use

The compressor station is located in a sparsely populated, rural area. The surrounding land lies within an area of significant cultural and sacred tribal resource to the Tribes. Portions of the Topock Maze are located nearby. The maze is a geoglyph (ground marking) and is of importance to the local Native American community. The area is within the traditional territory of the Aha Makav or Mojave Tribe. While the material remains of the past are important to these tribes, this area of traditional and spiritual use knows no boundaries for the Mojave.

As mentioned earlier, the compressor station occupies approximately 15 acres of a 65-acre parcel of PG&E-owned land. PG&E also owns a 100-acre parcel located about 0.25 miles north of the compressor station, purchased in 2004 to facilitate interim measures (IMs). In addition to the PG&E 100-acre parcel, the surrounding area includes land owned and/or managed by a number of government agencies, including the USBLM, USBOR, USFWS, San Bernardino County, California Department of Transportation, and BNSF Railroad. Industrial or commercial developments within a one-mile radius include the existing compressor station and IM No. 3 treatment plant facility. The nearest residents are located in Topock, Arizona, a community of about 20 people in a small mobile home park near the Topock Gorge Marina. Most of the residents in Topock are retired senior citizens who live in the area part of the year, typically from late fall through spring. There are also a few permanent homes (i.e., the homes are occupied all year) located on the southern side of I-40, along the shoreline between the pipeline bridge and the I-40.

The largest nearby community is Golden Shores, Arizona (population approximately 3,000), located approximately eight miles to the northeast and on the opposite side of the Colorado River from the site. The city of Needles, California, with a population of approximately 4,800, is located approximately 15 miles northwest of the site.

Moabi Regional Park is a recreational facility operated by the San Bernardino County Department of Parks and Recreation. It is located on land leased from USBLM and lies approximately one mile northwest of the compressor station on the west shore of the Colorado River. The park encompasses approximately 1,050 acres, includes a boat marina and 105 campsites, and provides access to the river for various sport and recreational activities. The park is located on a side channel of the Colorado River, approximately one mile west of the main river channel. The mobile homes are used primarily as weekend residences. As a regional park, it has no full-time residents, because campers are limited to five-month stays. The park does not keep records of residency; therefore, the number of people at the park at any given time is unknown.

The USBLM-managed lands within the area are owned by USBLM, San Bernardino County, and USBOR. These lands are considered public; however, public use is not encouraged, as the Topock Maze, a culturally significant area for several Native American tribes is located here, within the boundary of the HNWR.

A major gas utility and transportation corridor is located within the site. This corridor includes PG&E's two natural gas transmission pipelines, four natural gas transmission pipelines operated by other companies, the BNSF Railroad, and the I-40 freeway. Other developed land uses within the site include the National Trails Highway, which is the former Route 66 (and also known as Park Moabi Road), and various unnamed access roads. In addition, numerous groundwater well clusters, related to the ongoing groundwater investigation activities, are located throughout the site.

The HNWR (land that is managed by USFWS) encompasses approximately 37,515 acres along the Colorado River in Mojave and La Paz Counties, Arizona, and in San Bernardino County, California. Most of

the HNWR extends from the upper end of the Topock Marsh southward, to the head of Lake Havasu on the Arizona side of the Colorado River. The compressor station is completely surrounded by the HNWR. Recreational activities at the HNWR include sightseeing, bird watching, fishing, hunting, camping, and canoeing.

Figure 2-5 presents a map showing depicting the current owners and managers of the land in the area surrounding the site as well as anticipated future land use. There are two known active supply wells in the APE: PM-04, located in Park Moabi (on the northwest section of the APE), and Sanders, located on the Arizona side of the Colorado River. These known active supply wells are identified on Figure 2-6.

Future land use is discussed further below.

2.3.2 Future Land Use

PG&E plans to continue owning and operating the compressor station and associated property inside and outside the fence line as an industrial operation for the foreseeable future. Accordingly, the reasonably anticipated future use of the PG&E compressor station is for ongoing industrial operations.

Similarly, it is reasonable to assume that land that is owned by BNSF Railroad, and land that is leased by the California Department of Transportation, will continue in the future to be used for the railroad and interstate highway.

It is anticipated that title to the Interim Measures #3 (IM3) property will be transferred to the Fort Mojave Indian Tribe (FMIT) in 2009. The transfer is part of a global settlement of litigation brought by the FMIT against DTSC. As part of the property transfer, PG&E will maintain a site-wide easement over the IM3 property for siting of any facilities required by DTSC or the USDOI. Implementation of IM3 is expected to continue until a final corrective action/remedial action for the site is operating properly and successfully, and the regulatory agencies terminate the requirement for the IM3. For the compressor station, PG&E is the landowner, and use for the foreseeable future will continue to be industrial. If ever there is a need/desire to change the use, additional evaluations would have to be conducted at that time to address planned use. There is no agreement that will transfer this property. However, FMIT may exercise its option to purchase the property at its fair market value in the then existing condition when the facility is shut down, and when PG&E has no further use for the property for any utility purpose or for remediation related purposes.

As indicated above, and as depicted in Figure 2-5, a large portion of the land in the vicinity of the site is owned and/or managed by USBLM and the HNWR. Based on information provided by USDOI, current and future land use on national wildlife refuges is guided by the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (USFWS Organic Act; USDOI, 2007). The USFWS Organic Act describes the mission of the National Wildlife Refuge

System (the System) as the administration of "…a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, an plant resources and their habitats within the United States for the benefit of present and future generations of Americans." In addition to outlining the conservation mission of the National Wildlife Refuge System, the USFWS Organic Act details requirements for the management and use of a refuge and has requirements for land-use planning at each refuge, focusing on the preparation of a comprehensive conservation plan for each refuge and detailed compatibility determinations for each refuge.

According to information presented by USDOI, the primary conservation mission of USFWS as it applies to the HNWR, articulated in the USFWS Organic Act, the conservation management plans, and appropriate use and compatibility policies, limits human use of HNWR property and reduces the likelihood of transferring HNWR property out of federal ownership (USDOI, 2007). According to USDOI, this supports that human use of the HNWR property will continue, in the future, to be restricted to recreational uses consistent with these statutory, regulatory, and policy guidelines.

San Bernardino County has requested that USBLM allow them to expand the leased premises into the Topock site, stretching along the floodplain from the currently leased property south to the railroad bridge. The purpose of the proposed expansion included a variety of seasonal residential and recreational uses, including mobile homes, expansion of tent camping and recreational vehicle areas, a hotel, and reconstruction of an old restaurant. According to USDOI, the requested expansion by San Bernardino County would allow for new pull-through recreational vehicle camping sites and tent camping areas. These areas would be located south and east of the BCW, west of the beach area, east of old Route 66 (also known as National Trails Highway and Park Moabi Road), and north of the railroad. It would seem that use of the floodplain area for camping would be considered an undertaking, and would require USBLM to determine whether camping would create any visual impacts to the Topock Maze or other eligible properties, and whether these uses are compatible with the objective of preserving these resources for the future (USDOI, 2007). However, according to USDOI, the continuing development of adjacent property combined with USBLM's broad land management leave open the possibility that USBLM land may be transferred out of federal ownership.

In sum, and as discussed in the RAWP (ARCADIS, 2008), although future residential use of the USBLM land is unlikely, USDOI has specifically requested an evaluation of future residential use on USBLM property for the following three reasons: (1) it is reasonably foreseeable that the land may be transferred out of federal ownership; (2) human use of Park Moabi-leased portion will continue to include both seasonal use by the public and year-round residential use by a limited number of San Bernardino county staff; and (3) it is reasonably foreseeable that camping on the floodplain will occur under either San Bernardino's proposed expansion or USBLM's future use of non-leased areas.

2.4 Site Historical Operations

In December 1951, the compressor station began operations to compress natural gas supplied from the southwestern United States for transport through pipelines to PG&E's service territory in central and northern California. The State of California owned the property on which the compressor station was built. From 1951 to 1965, PG&E leased the property from the state. In 1965, PG&E purchased the property from the state. The compressor station is still active and is expected to remain active into the foreseeable future.

Current operations at the compressor station are very similar to the operations that occurred from the start of facility operations in 1951. Operations at the compressor station consist of six major activities: compression of natural gas, cooling of the compressed natural gas and compressor lubricating oil, water conditioning, wastewater treatment, facility and equipment maintenance, and miscellaneous operations. The greatest use of chemical products at the facility involves treatment of cooling water, and the greatest volume of waste produced consists of blowdown from the cooling towers (i.e., water that is routinely removed from the towers to prevent salt buildup and scale formation).

From 1951 to 1985, hexavalent chromium-based products were added to the cooling water to inhibit corrosion, minimize scale formation, and control biological growth. From 1951 to 1964, untreated wastewater (i.e., blowdown) containing hexavalent chromium was discharged to the BCW. Aerial photographs from that time period show what appears to be light-colored flow in the BCW that originates at the discharge point and, at times, extends up to 1,600 feet northward. Beginning in 1964, PG&E treated the wastewater by converting hexavalent chromium to trivalent chromium. At about this time, PG&E also constructed a percolation bed in the BCW by creating soil berms that impounded the discharged wastewater and allowed it to percolate into the ground and/or evaporate. In 1969, PG&E began treating the wastewater in a two-step process that converted hexavalent chromium to trivalent chromium (Step 1), and then removed trivalent chromium via precipitation (Step 2).

Beginning in May 1970, treated wastewater was discharged to an injection well (PGE-08) located on PG&E property (Figure 2-7), and discharges to the BCW generally ceased. The well facilitated the injection of wastewater into the subsurface at depths in excess of 405 feet below ground surface (bgs). By 1971, PG&E had constructed the first of four single-lined evaporation ponds and used this pond as a discharge location when operational problems were encountered with the injection well. In 1973, PG&E discontinued use of injection well PGE-08, and wastewater was discharged exclusively to the four, single-lined evaporation ponds, located about 1,600 feet west of the compressor station.

PG&E replaced the hexavalent chromium-based cooling water-treatment products with non-hazardous phosphate-based products in 1985, at which time PG&E discontinued operation of the wastewater treatment system. Use of the four, single-lined evaporation ponds continued until 1989. In 1989, the single-lined ponds were replaced with four new, Class II (double-lined) ponds, located approximately 1.2 miles northwest. The

wastewater treatment system and the single-lined ponds were physically removed and clean-closed between 1988 and 1993. The four, Class II double-lined ponds, which are on USBLM property, are still in use and are operated under jurisdiction of the Regional Water Quality Control Board, Colorado River Basin Region.

2.4.1 Solid Waste Management Units/Areas of Concern

The potential SWMUs and AOCs at the site identified by DTSC in the CACA or in subsequent DTSC directives included 14 SWMUs, 20 AOCs, and two undesignated areas.

As summarized in the Revised Final RFI/RI Volume 1 (CH2M HILL, 2007a), the SWMUs and AOCs that will be carried forward into the RCRA Corrective Action and CERCLA Program are discussed below and identified on Figure 2-7 and Table 2-5. Two of these sites (SWMU 1/AOC 1 and SWMU 2 Inactive Injection Well PGE-08) were associated with the historical discharge of wastewater from the facility and are the focus of the RFI/RI Volume 2 and this GWRA. The remaining AOCs, SWMUs, and undesignated areas are either closed or will be included in the forthcoming risk assessments or RFI/RI Volume 3.

2.4.2 Known Groundwater Plume

Groundwater data indicate that the hexavalent chromium plume is confined to the alluvial aquifer and extends over a distance of approximately 2,800 feet from the southern edge of the alluvial aquifer (upper BCW) to the Colorado River floodplain, covering approximately 90 acres. The extent of the plume at various depths in the alluvial aquifer is depicted in the RFI/RI Volume 2 on Figures 6-9a through 6-9c (CH2M HILL, 2009a). A conceptual hydrogeologic site model is shown on Figure 2-3. Reducing conditions have been documented in most shallow to mid-depth fluvial wells and sediments near and underlying the river. South of the railroad tracks, these reducing conditions are also encountered in deep wells near and beneath the river. In this area, hexavalent chromium reverts to trivalent chromium, which is immobilized in the sediments, as evidenced by its absence in groundwater samples collected from fluvial wells screened in reducing material. There is significant capacity in the fluvial deposits underlying the river to reduce and remove hexavalent chromium from groundwater. This process is a beneficial factor limiting hexavalent chromium migration to the river under current conditions. Uncertainties remain regarding the extent to which reducing conditions in fluvial deposits provide a pervasive and permanent barrier to hexavalent chromium contaminant migration to the river (CH2M HILL, 2009a).

2.5 Groundwater and Surface Water Investigations

Previous groundwater investigations are discussed in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) and are summarized in this section. Groundwater sampling locations for RFI/RI characterization are shown on Figure 2-8. Background groundwater sampling locations are shown on Figure 2-9.

RFI field activities began in June 1997, and six phases of work were completed between July 1997 and October 2007. The scope of work for each phase was determined by using the findings from previous investigation phases. Work plans for the various investigation programs were approved by DTSC prior to implementation, as well as USDOI, other state and local agencies, and in consultation with stakeholders as appropriate. Data included in this report were collected within the APE[7], between 1997 and 2007, by PG&E and its consultants in accordance with agency-approved plans and procedures and in conformance with data quality control (QC) programs. Field activities included drilling and hydrogeologic investigations, hydraulic testing, groundwater monitoring well installation, groundwater sample collection, surface water sampling, porewater sampling, and river sediment sampling. Surface water sampling locations are shown on Figure 2-10 and porewater sampling locations are shown on Figure 2-11.

Sample collection and management under the RFI program was performed in accordance with the RFI work plan, the RFI work plan amendments, and several additional matrix-specific sampling and analysis plans. Quality assurance/quality control (QA/QC) programs were also implemented to ensure that the data were of high quality and met the purpose and objectives of the RFI/RI. Work performed during each of the six phases, as well as additional work presented in the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b), is described below.

2.5.1 Phase 1

During Phase 1, seven groundwater monitoring wells were installed and sampled. In addition, 11 pre-existing wells and four river locations were sampled. The analytical results indicated that hexavalent chromium was present in groundwater, and that additional wells were needed to define the extent of hexavalent chromium in groundwater. Hexavalent chromium was not detected in samples collected from the Colorado River.

Initiation of the groundwater and surface water monitoring program began during Phase 1, which included routine collection of groundwater samples from existing wells and surface water samples from the Colorado River.

2.5.2 Phase 2

During Phase 2, 11 additional groundwater monitoring wells were installed and sampled to investigate the lateral and vertical extent of hexavalent chromium in groundwater and to further define groundwater gradients. Routine groundwater and surface water monitoring continued during this phase, with expansion of

[7] The APE is defined as the area that may be potentially affected by the RFI/RI activities. The APE was defined for the purpose of assessing potential environmental impacts associated with investigation and remediation activities.

the number of wells and surface water locations in the program. Overall, groundwater results indicated that additional wells were needed to define the horizontal and vertical extent of hexavalent chromium.

2.5.3 Phase 3

Nine additional groundwater monitoring wells were installed during Phase 3. The new wells included four in the floodplain, two adjacent to existing well MW-20-70 to create a three-well vertical cluster, and one near the Railroad Debris site. Routine groundwater and surface water monitoring continued during this phase with expansion of the number of wells and surface water locations in the program.

At the request of DTSC, the first draft RFI report (E&E, 2000) was prepared and submitted to DTSC at the completion of Phase 3 in April 2000. Following review of the first draft RFI report, the DTSC required additional work to better define the groundwater plume boundaries and mechanisms.

2.5.4 Phase 4

Seven new groundwater monitoring wells were installed along the western shore of the Colorado River during Phase 4. Routine groundwater and surface water monitoring continued during this phase. In addition, hydraulic testing was conducted on selected wells in the Study Area. The hydraulic tests were conducted in January and February 2002, and the report was submitted to DTSC in April 2002 (E&E, 2002). The second draft RFI report (E&E, 2004) was prepared and submitted to DTSC at the completion of Phase 4 in February 2004.

2.5.5 Phase 5

As discussed in Section 1, PG&E began implementation of an IM at the site in March 2004, and Phase 5 of the RFI/RI included data collection to further characterize COPCs in groundwater and to evaluate the effectiveness of IM activities. During Phase 5, groundwater extraction wells were installed and were tested at two locations, and 22 groundwater monitoring wells were installed at eight locations.

The initial effort for Phase 5, in November 2003, involved installation, development, and aquifer testing of test well TW-1 located on the northern side of the site (Figure 2-8). Additional field activities in support of the IM included the installation, development, and aquifer testing of test well TW-2 between March and May 2004. TW-2S (shallow) and TW-2D (deep) are paired extraction/test wells screened at different depth intervals.

Phase 5 also included the installation of 22 new monitoring wells at eight locations, conducted between March 2004 and May 2004. Three of these monitoring well locations were on the floodplain between the MW-20 bench and the western shore of the Colorado River. The MW-36 and MW-39 monitoring well

clusters—each constructed with six screen depths—were installed in an east-west-trending transect with existing well MW-30 on the floodplain east of the MW-20 bench. The monitoring wells added better vertical definition of the hydrostratigraphy and chromium distribution in the floodplain area. Four new monitoring well clusters (locations MW-35, MW-37, MW-38, and MW-40) were also installed at locations to the north, west, and south of the MW-20 bench for the purpose of plume delineation and a better understanding of the relation of alluvial fan and floodplain hydrostratigraphy.

Routine groundwater and surface water monitoring continued during Phase 5, with expansion of the wells and surface water locations in the program. Prior to Phase 5, routine groundwater and surface water monitoring was generally conducted on a quarterly sampling frequency. Beginning in Phase 5, key floodplain wells were placed on accelerated (weekly, biweekly, or monthly) sampling schedules.

In addition, with the initiation of IM activities in March 2004, PG&E began implementation of a separate monitoring program, referred to as the IM Performance Monitoring Program (PMP), with a separate data collection program from the routine groundwater and surface water monitoring program. The PMP collects and presents data to assess the performance of the IM to maintain a net landward hydraulic gradient through the collection of water level measurements in wells and the river.

2.5.6 Phase 6

During Phase 6, additional data were collected to further characterize site hydrogeologic conditions, to more completely define the nature and extent of contamination and to address comments on the 2005 RFI Report (CH2M HILL, 2005a). Also during Phase 6, additional IM wells were installed and data were collected to support evaluation of ongoing IM activities.

During Phase 6, two additional extraction wells, TW-3D and PE-1, were installed on the MW-20 bench and in the floodplain, respectively, for IM extraction activities. In addition, two groundwater injection wells (IW-2 and IW-3) were installed in an area west of the groundwater plume referred to as the East Mesa, as well as 17 compliance/observation wells for monitoring of groundwater injection activities associated with the IM.

Data collected during Phase 6 of the RFI/RI included a pore water study and the installation and sampling of 32 additional monitoring wells (including two wells with multiple screened depths installed at an angle beneath the Colorado River). Phase 6 also included hydraulic testing of bedrock wells, as well as hydraulic testing of alluvial floodplain wells.

Routine groundwater and surface water monitoring continued during this phase with expansion of the number of wells in the program. During this phase, the routine surface water monitoring program was expanded to include nine additional in-channel locations with samples collected at multiple depths in the river. The PMP continued during Phase 6 and included routine water level and analytical sampling data from

wells in the extraction area (floodplain). Additionally, beginning in July 2006 with the initiation of groundwater injection associated with the IM, PG&E began implementation of a separate and unique monitoring program, referred to as the IM Compliance Monitoring Program, which includes routine water level and analytical sampling data from wells in the injection area (East Mesa).

PG&E implemented several related studies during this phase. These studies include a groundwater background study (CH2M HILL, 2008a,b), a chromium isotope study (CH2M HILL, 2008d), a floodplain in-situ pilot study (MWH, 2005), an upland in-situ pilot study (BBL, 2006), and aerobic/anaerobic core testing (CH2M HILL, 2005b). The Groundwater Background Study (CH2M HILL, 2008a,b) is described in more detail below.

2.5.7 Background Investigations

The Groundwater Background Study (CH2M HILL, 2008a,b) was performed to define an upper threshold limit (UTL) concentration for hexavalent chromium, total chromium, and other metals in groundwater in the region surrounding the site. The UTL concentration represents the upper concentration of the constituent in natural groundwater not affected by contamination. The background study involved sample collection at existing wells both within and outside the APE during six sampling events between May 2005 and May 2006 (Figure 2-8). The results of the background study, including calculated UTLs, are reported in the *Revised Groundwater Background Study Steps 3 and 4: Final Report of Results* (CH2M HILL, 2008b). The calculated UTLs for metals from the Groundwater Background Study are reported in Section 6.1 of the RFI/RI Volume 2 (CH2M HILL, 2009a) and used for evaluation of metals data collected from the site.

2.5.8 Additional Investigations in Response to Stakeholder Comments

Additional data and information were collected between October 2007 and September 2008 and reported in the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b). These datasets were collected at the direction of DTSC or USDOI. These datasets were collected after the October 2007 cutoff date for data included in the RFI/RI Volume 2 report (CH2M HILL, 2009a). This effort consisted of three main tasks:

- Records review for updated information and chronology of dredging locations, bank stabilization, and other man-made effects on river morphology
- Additional hydrogeologic investigations
- Additional groundwater characterization: five new vertical wells and three slant wells were installed on the Arizona shoreline in March and April 2008.

The analytical data collected through July 2008 are included in this GWRA.

2.5.9 Ongoing Groundwater Characterization

The groundwater and Colorado River water monitoring activities that began in 1997 as part of the RFI groundwater investigations have been incorporated into an ongoing Groundwater Monitoring Program (GMP). The initial six years of monitoring consisted of quarterly monitoring well and surface water sampling. Installation of additional monitoring wells has occurred throughout the program as described above. The monitoring program has been modified several times to include these additional wells and to increase the sampling frequency at floodplain wells closest to the river and river water stations.

The current GMP includes sampling for hexavalent and dissolved total chromium at over 100 wells on a routine basis. Sampling and analysis for other water chemistry parameters also occurs quarterly in select wells. Several other wells in the area are sampled on a less frequent schedule, and private domestic or agricultural wells are sampled as requested. PG&E reports monitoring results to the DTSC via quarterly monitoring reports.

Additional groundwater investigations that are in progress for the areas outside the compressor station are addressed in the *Revised Work Plan for East Ravine Groundwater Investigation* (CH2M HILL, 2008c).

2.5.10 Summary

In summary, the RFI/RI has been underway since 1996 and has yielded a large and wide-ranging dataset on which to base risk estimates. Groundwater investigation has been ongoing since 1997. There is a recognized hexavalent chromium plume in groundwater that has been controlled by an IM operating since 2004. In addition, analytical data have been collected by PG&E and Metropolitan Water District of Southern California (MWD) from surface water in the Colorado River both upstream and downstream of the site. These groundwater and surface water data are discussed in detail in Section 3. Section 3 also provides an evaluation of the groundwater and surface water data usability to support this GWRA.

3. Summary of Investigations and Analytical Results

As discussed in Section 1, PG&E's activities in support of the RFI/RI began in 1996 with the signing of the CACA (CalEPA, 1996b). Since 1996, there have been multiple phases of investigation at the site to collect data to fulfill the objectives of the RFI/RI. This section summarizes the data collected for inclusion in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b), and describes the usability of these analytical data for purposes of this GWRA.

As specified in the *Human Health and Ecological Risk Assessment Work Plan* (RAWP) (ARCADIS, 2008), this GWRA relies upon the groundwater and surface water data collected and presented in the RFI/RI Volume 2 and RFI/RI Volume 2 Addendum[2]; surface water data collected by the MWD (2007; 2008) are also considered. This section represents a summary of the more detailed discussions presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b), focusing specifically on the scope of the investigations and data that are used in the quantitative risk assessment. (Please refer to the RFI/RI Volume 2 [CH2M HILL, 2009a] and RFI/RI Volume 2 Addendum [CH2M HILL, 2009b] for a more thorough discussion of the different phases of the investigations, sampling protocols, field methods, data quality programs, and agency approvals for collection of data).

The individual constituents or parameters that have been monitored in groundwater and/or surface water and are presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) may be categorized as follows:

- Total and hexavalent chromium
- 18 metals consisting of aluminum, antimony, arsenic, barium, beryllium, cadmium, total chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc
- Other constituents measured during the RFI/RI in selected wells and select sampling events to assess potential presence in groundwater, including volatile organic compounds (VOCs); semivolatile organic compounds (SVOCs); polychlorinated biphenyls (PCBs); perchlorate; strontium; radionuclides; and total petroleum hydrocarbons (TPH) in the gasoline, diesel, and motor oil ranges
- General chemistry parameters that were measured during the RFI/RI to identify water sources, key chemical processes, and reactions that may be occurring along flowpaths, including, but not limited to, major cations (e.g., sodium, potassium, calcium, magnesium); major anions (e.g., fluoride, chloride, bicarbonate, sulfate); TDS and associated parameters of specific conductance and salinity; temperature; pH; and redox sensitive parameters (e.g., oxidation-reduction potential, dissolved oxygen, nitrate, ammonia, manganese, iron, sulfide, and total organic carbon).

This section describes the data evaluation process in which the available groundwater and surface water data collected for the RFI/RI are narrowed down to initial constituents of potential concern (ICOPCs) through exclusion of constituents or general chemistry parameters that are not applicable to human health or environmental risk assessments (e.g., TDS and pH) or have not been detected at the site (e.g., PCBs). Those constituents that are not excluded through this initial screening-level evaluation process are defined as ICOPCs and are carried forwards to the COPC selection processes described in Section 4. Constituents selected as COPCs are then quantitatively evaluated in subsequent sections of this GWRA.

3.1 Summary of Data Included in the Risk Assessment

As described in Section 2, the data included in this GWRA were presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b)[2]. In general, the data presented in the RFI/RI Volume 2 were collected between the start of the RFI field sampling activities in July 1997 and October 2007. The data presented in the RFI/RI Volume 2 Addendum were collected between November 2007 and September 2008 and consisted primarily of groundwater data. No additional surface water data during this time period was presented in the RFI/RI Volume 2 Addendum.

The data included in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) are generally limited to data collected by PG&E and its consultants, in accordance with agency-approved plans and procedures and in conformance with data QC programs. Studies conducted within the Study Area by others were referenced in the RFI/RI; however, the data collected by others were not included as part of the RFI/RI dataset, and therefore are not, in general, included in this GWRA. The one exception pertains to surface water sampling that was collected by MWD (2007; 2008). Although these surface water monitoring data were not collected by PG&E, they are presented in an appendix to the RFI/RI Volume 2 (CH2M HILL, 2009a) and are used in this GWRA, as discussed in subsequent sections.

The following subsections discuss the data presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) considered for inclusion in this GWRA[8], beginning with a discussion of the hydrogeologic investigations, followed by a description of the groundwater and surface water sampling programs. All data considered for inclusion in this GWRA are provided in Appendix A (Groundwater Data Summary), Appendix B (Surface Water Data Summary), and Appendix C (Surface Water

[8] As described in Section 3.2, the only data that are not evaluated and considered for potential inclusion in this GWRA include a subset of the general chemistry parameters that were measured to identify water sources, key chemical processes, and reactions along the flowpaths. Through discussions with DTSC and USDOI, as documented in the RAWP Addendum (ARCADIS, 2009), it was determined that a subset of these general chemistry parameters are not applicable to the risk assessment process. Please refer to Section 3.2 for more detail.

Data Summary – MWD). Generally, and as described more fully in the sections below, those constituents that are applicable to human or ecological health and have been detected at least once at the site are defined as ICOPCs and are passed forward to the COPC selection processes described in Section 4. Separate ICOPC lists are developed for: (1) evaluation of future hypothetical direct human exposure to groundwater (groundwater ICOPCs), and (2) evaluation of the potential for constituents in the floodplain wells to be released to the surface water (floodplain ICOPCs).

3.1.1 Hydrogeologic Investigations

3.1.1.1 Wells for RFI/RI Characterization

As summarized in Section 2, six phases of drilling and hydrogeologic investigations were conducted between June 1997 and October 2007 to characterize site hydrogeology, groundwater conditions, and the nature and extent of constituents in groundwater. These investigations included the installation and sampling of more than 100 groundwater monitoring wells at 53 locations to support the RFI/RI groundwater characterization. As part of IM implementation during November 2003 through April 2006, four groundwater test and extraction wells and two injection wells were installed. Further, from January 2006 to June 2007, drilling investigations were also completed for the in situ pilot test studies, which included installation and sampling of 27 monitoring wells (nine vertical well clusters), three injection wells, and two recirculation wells. Additionally, five vertical wells and three slant wells were installed on the Arizona shore of the Colorado River in 2008. Figure 2-8 shows the locations of the RFI/RI wells and drilling locations and additional PG&E monitoring and supply wells that provided data for the RFI/RI.

3.1.1.2 Groundwater Monitoring Zones Designations

As described in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b), the RFI/RI wells are assigned to one of five primary “monitoring zone” designations, which are based on relative depth and position within the alluvial aquifer and bedrock lithology.

Groundwater monitoring data collected from all of these monitoring zones are included in the quantitative risk assessment for hypothetical future groundwater use. As described in Section 5, under current conditions, there are no users of the underlying groundwater affected by the plume. Site groundwater is designated as having beneficial uses in the Colorado River Basin Plan (CRWQCB, 2006), however, and it is theoretically possible that site groundwater may be extracted and used as a potable water source in the future. Thus, as described in later sections, under the assumption that the groundwater in the future could be used as a potable source of water, this GWRA assumes that groundwater from any and all depth zones could be available for human use. Accordingly, designation by monitoring zone is not relevant to the quantitative estimate of exposure and risk.

3.1.2 Site-Wide Groundwater Sampling

The analytical data presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b)[2] that are used to describe the nature and extent of potential groundwater impacts include data collected by PG&E in compliance with QA requirements in the CACA (CalEPA, 1996b) and under the investigation work plans and monitoring plans approved by DTSC and other regulatory agencies, as applicable. The individual groundwater sampling/well locations are shown on Figure 2-8.

Tables 3-1a and 3-1b present the overall scope of groundwater sampling that has occurred, over time, at each of the different monitoring locations. Specifically, Table 3-1a summarizes, for each well, the number of sampling events used to characterize the nature and extent of metals in groundwater at the site. As indicated in Table 3-1a, 167 wells across the Study Area were analyzed for hexavalent chromium and total chromium beginning in 1997. Also beginning in 1997, 84 wells have been monitored for lead, and 86 wells have been monitored for copper, nickel, and zinc since these were the original constituents that were specified for evaluation in the CACA (CalEPA, 1996b). Beginning in approximately 2004, monitoring for a more comprehensive list of metals was implemented at select locations across the Study Area. In general, sampling for the complete list of Title 22 metals (and aluminum, which is not listed as a Title 22 metal) has varied between 68 and 83 wells, depending on the monitoring event.

Similarly, Table 3-1b summarizes, for each well, the number of sampling events for the other constituents (e.g., VOCs, TPH, and polycyclic aromatic hydrocarbons [PAHs]) that have been conducted since the beginning of the RFI/RI in 1997. As indicated, sampling for the other constituents has been more limited, as these constituents were generally not believed to be associated with facility operations and/or known historical releases from the facility.

Groundwater sampling results are discussed below in Section 3.2. Detailed analytical results for site groundwater are presented in Appendix A.

3.1.3 Surface Water Sampling

From July 1997 through October 2007, surface water samples were collected from up to 43 surface water sampling locations (some samples collected at multiple depths), as depicted in Figure 2-10. The surface water monitoring program has been in place since 1997 and includes routine surface water sample collection from select locations and depths in the Colorado River. Sample collection for the River Monitoring Program (RMP) was performed in accordance with approved monitoring plans and standard operating procedures, described in the RFI/RI Volume 2 (CH2M HILL, 2009a). Since 2005, RMP events have been conducted quarterly during most of the year and monthly during low river stages (typically November through January). Prior to 2005, RMP events were typically performed quarterly. Surface water samples have also been collected during one-time events, such as during the pore water study in January 2006.

Table 3-2 presents the overall scope of the surface water sampling program. Specifically, Table 3-2 presents, for each surface water sampling location, the period over which the sampling occurred, the total number of sampling events, and the constituents analyzed. As indicated in Table 3-2, the primary constituents analyzed in the surface water sampling program were total chromium and hexavalent chromium. More limited analysis of the surface water samples has occurred for other constituents. Surface water sampling results are briefly discussed below in Section 3.2. Detailed analytical results for the surface water data are presented in Appendix B. Consistent with the RMP and standard operating procedures, surface water samples that were analyzed for hexavalent chromium and other metals were filtered prior to analysis. Thus, the surface water sampling results relied upon in this GWRA represent dissolved concentrations of metals. At the request of DTSC and USDOI, unfiltered samples from the river were collected beginning in August 2008. As agreed in the RAWP Addendum (ARCADIS, 2009), unfiltered samples may be used to supplement this GWRA in the event that the surface water exposure pathway is determined to have a significant contribution to human health risk.

In addition to the surface water monitoring data described above, MWD has been monitoring for hexavalent chromium and other metals in the Colorado River for the last few years. All analyses were conducted at MWD's Water Quality Laboratory. In contrast to the surface water samples collected as part of the RMP, the surface water samples collected by MWD represent unfiltered samples. Surface water monitoring data collected by MWD during 2003 (prior to the initiation of the IM plant) and from August 2007 and July 2008 are provided in Appendix C. Although the MWD surface water data were not collected in accordance with the PG&E RMP and the related standard operating procedures, the MWD data provide useful supplemental information for some Title 22 metals. Therefore, they are discussed and incorporated, as relevant and appropriate, to provide additional understanding of surface water quality conditions.

3.1.4 Scope of Groundwater Background Sampling

PG&E implemented a Groundwater Background Study to more completely evaluate the range of naturally occurring metals concentrations, including hexavalent chromium, in groundwater in the vicinity of the site (CH2M HILL, 2005a). The Groundwater Background Study areas and sampling locations are shown on Figure 2-8. The Groundwater Background Study was implemented in accordance with the *Work Plan for Assessing Background Metals Concentrations in Groundwater* (Background Study Work Plan) (CH2M HILL, 2004c), which was approved by DTSC on October 29, 2004 (CalEPA, 2004). The approved Background Study Work Plan (CH2M HILL, 2004c) describes a process for identifying and evaluating potential background wells for sample collection and determining background metals concentrations in groundwater. The results of the Groundwater Background Study, including the calculated background concentrations of metals in groundwater using data from the six sampling events at the approved 25 background study wells, were submitted to DSTC and USDOI on January 14, 2008, in the *Revised Groundwater Background Study Steps 3 and 4: Report of Results* (CH2M HILL, 2008a). A finalized version of the Groundwater Background

Study, incorporating comments received from DTSC and USDOI, was submitted on July 23, 2008 (CH2M HILL, 2008b).

Background groundwater sampling results are briefly discussed below in Section 3.2. The individual sample results that compose the background dataset are presented in Appendix A. This is the background dataset that will be used, as described in Section 4, to differentiate between constituents that are potentially detected above background and, therefore, need to be carried through as COPCs in the quantitative risk assessment.

3.2 Discussion of Groundwater and Surface Water Monitoring Results

The purpose of this section is to focus the discussion and presentation of the groundwater and surface water monitoring results on those constituents that are relevant to this GWRA and remedy selection process.

As indicated in the previous sections, the groundwater and surface water monitoring conducted at the site has included monitoring for numerous constituents; many of these constituents were sampled and analyzed to understand the nature and extent of potential facility-related impacts to the groundwater. Additionally, as described in the RFI/RI Volume 2 (CH2M HILL, 2009a), there are a variety of general chemical parameters that are being monitored in the groundwater and surface water to identify the characteristics of the waters in each hydrogeologic group, and to identify water sources, key chemical processes, and reactions that may be occurring along flowpaths. The general chemical parameters, as described in the RFI/RI Volume 2 (CH2M HILL, 2009a) include major cations (e.g., sodium, potassium, calcium, magnesium); major anions (e.g., fluoride, chloride, bicarbonate, sulfate); TDS and associated parameters of specific conductance and salinity; temperature; pH; and redox sensitive parameters (e.g., oxidation-reduction potential, dissolved oxygen, nitrate, ammonia, manganese, iron, sulfide, and total organic carbon).

Although these general chemical parameters are not being monitored as potential releases from the facility, DTSC and USDOI specifically requested that a screening-level evaluation be conducted on a subset of these general chemical parameters to ascertain whether they should be included in the quantitative risk assessment. Specifically, and as documented in the RAWP Addendum (ARCADIS, 2009), USDOI and DTSC requested a screening-level evaluation be conducted on the following 13 constituents: sodium, potassium, calcium, magnesium, fluoride, chloride, bicarbonate, sulfate, nitrate, ammonia, manganese, iron, and sulfide. For the purposes of this GWRA, these 13 constituents are defined as “other inorganic compounds.”

As agreed with DTSC and USDOI, a screening-level evaluation for these 13 constituents is presented in Appendix D. The screening-level evaluation for these 13 constituents was conducted based on the potential for human health impacts, in addition to the potential for these constituents to impact the Colorado River (should the groundwater-to-surface water pathway be deemed to be a significant and complete transport pathway). The results of the screening-level evaluation for these 13 constituents, as presented in Appendix

D, are summarized below in Section 3.2.2. As discussed and agreed with DTSC and USDOI, the other general chemical parameters were deemed not to be applicable to the human health or ecological risk assessment process and are, therefore, not discussed further in this GWRA.

As described above and in accordance with the RAWP (ARCADIS, 2008), the three primary objectives of this GWRA are to: (1) help determine the need for remedial action with respect to groundwater conditions; (2) provide a basis for determining levels of constituents that can remain in groundwater at the site and still adequately protect public health; and (3) identify complete and significant exposure pathways, if any, from groundwater to surface water (the Colorado River). In order to meet the project objectives to evaluate the groundwater potential exposures and the groundwater-to-surface water discharge pathway, the groundwater and surface water monitoring data have been organized and will be evaluated in accordance with the following groupings, which are defined below:

- Background groundwater
- Site[3] groundwater
- Floodplain groundwater (a subset of site-wide groundwater)
- Surface water.

This approach is consistent with the approach set forth in the RAWP (ARCADIS, 2008).

3.2.1 Groupings of Groundwater and Surface Water Data

3.2.1.1 Background Groundwater

As described in Section 4, the background groundwater dataset is used to assess whether constituents detected in site groundwater are potentially elevated above background and, therefore, should be carried through as COPCs in the quantitative risk assessment. The groundwater monitoring wells that are used to characterize background groundwater conditions (CH2M HILL, 2008b) are identified in Table 3-3. Table 3-4a lists constituents that were analyzed during the Groundwater Background Study and identifies those constituents that were detected. As indicated, cadmium and mercury are the only two metals that were not detected in the background wells.

3.2.1.2 Site Groundwater

The data collected from the rest of the groundwater monitoring network (i.e., those wells that are not considered background wells) are used, as described in subsequent sections, to assess future hypothetical

risks on an individual-well basis, as well as to obtain an understanding of overall site-wide groundwater conditions and specifically to address the groundwater-to-surface water pathway. The groundwater wells that are used to characterize site-wide conditions are identified in Table 3-3.

The majority of this monitoring well network comprises wells that were installed to evaluate the extent of hexavalent chromium impacts associated with historical discharges to the BCW. In addition to these wells, there are seven monitoring wells that are located around the new evaporation ponds (located approximately 3,000 feet west of the compressor station); routine sampling of these seven wells occurs in accordance with the active Waste Discharge Requirement Monitoring (CH2M HILL, 2009a). The wells surrounding the new evaporation ponds are identified on Figure 2-8. They are included in the site-wide well group on Table 3-3.

Further, as part of the ongoing IMs, groundwater is extracted, treated, and re-injected in an area approximately 1,650 feet north of the compressor station facility boundary. There are four extraction wells (TW-2D, TW-3D, TW-2S, and PE-1) and two injection wells where the treated groundwater is returned to the aquifer (IW-2 and IW-3). As a component of this IM, ongoing monitoring of the network of observation and compliance wells occurs in accordance with the *Groundwater Compliance Monitoring Plan* (CH2M HILL, 2005c). The observation ("OW-") wells and compliance monitoring ("CW-") wells are identified on Figure 2-8.

Table 3-4b lists constituents that were analyzed during the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) period and identifies those that were detected. As indicated, the groups of constituents that were analyzed includes metals, other inorganic compounds (monitored to understand the general characteristics of the waters in each hydrogeologic unit), perchlorate, strontium, certain radiological compounds, VOCs, TPH, SVOCs, PAHs, and PCBs. In general, the constituents detected in the site groundwater include the metals, other inorganic compounds, and strontium. Only two radiological compounds, four VOCs, and one PAH have been detected in site groundwater; with the exception of chloroform, which was detected in 5 of 31 samples, these compounds were detected in only one sampling event.

3.2.1.3 Floodplain Groundwater

In accordance with the RAWP (ARCADIS, 2008), in order to evaluate the significance of the groundwater-to-surface water transport pathway, wells that are considered to be in geographic proximity to the river are identified and evaluated separately from the rest of the site-wide wells to address the groundwater-to-surface water migration pathway. The wells representing the body of groundwater that could migrate to the river are, for the purposes of this GWRA, referred to as "floodplain wells" and are identified in Table 3-3. For purposes of evaluating the groundwater-to-surface water transport pathway, floodplain wells are defined as those wells located east of National Trails Highway (also known as Route 66 and Moabi Park Road). Table 3-4c lists constituents that were analyzed in the floodplain wells and identifies those constituents that were detected.

3.2.1.4 Surface Water

In accordance with the RAWP (ARCADIS, 2008), for all constituents in groundwater that could potentially be impacting surface water, an analysis of the surface water data is to be conducted comparing downstream concentrations to upstream concentrations. Table 3-5 presents the groupings of the surface water sampling locations as either upstream or downstream sampling locations. All samples that were collected upstream of the outfall of the BCW are classified as upstream sampling locations, and all samples collected at or below the outfall of the BCW are considered downstream sampling locations. The surface water samples collected in the Colorado River upstream of the BCW outfall and in Topock Marsh upstream of sampling location C-MAR are considered to be representative of background (i.e., not impacted by site activities) conditions in the Colorado River and Topock Marsh (Figure 2-10).

Tables 3-6a and 3-6b list constituents analyzed in upstream and downstream surface water, respectively, and identify those constituents that were detected. As indicated, the groups of constituents that were analyzed include select metals, other inorganic compounds, and perchlorate. In general, the constituents detected in surface water, either upstream or downstream, include select metals and other inorganic compounds. Notably, with two exceptions described below, hexavalent chromium was not detected in either upstream or downstream surface water samples.

- As discussed in the RFI/RI Volume 2 (CH2M HILL, 2009a), during September 2007 surface water sampling, hexavalent chromium was reported at a trace concentration of 0.4 micrograms per liter (µg/L) at one in-channel surface water location (C-R22). Subsequent investigation revealed that hexavalent chromium was present at low levels in the buffer solutions used for both field preservation and laboratory analysis of the samples (CH2M HILL, 2009a). The presence of hexavalent chromium in the buffer solutions is thought to be responsible for the low-level hexavalent chromium result at C-R22. Consistent with this conclusion, hexavalent chromium was detected at low levels in both laboratory blanks and a field blank that were preserved and analyzed with the same batch of buffer solution. Therefore, the C-R22 detection was flagged with a “J” data qualifier, indicating that there is uncertainty regarding the reported concentration value (the “J” data qualifier, or “flag,” indicates that the value is an estimated value).

- Resampling was conducted on the following day at the same location and at step-out locations 1 meter away from the original location in four directions. An additional round of samples was also collected from all river sampling stations. In total, there were three resampling rounds of all the surface water stations in September and October 2007. None of these additional verification samples had detections of hexavalent chromium greater than analytical reporting limits.

- As discussed in the RFI/RI Volume 2 (CH2M HILL, 2009a), Cr(VI) was detected during one shoreline sampling event in June 2002. During June 2002 surface water sampling, Cr(VI) was reported at

concentrations ranging from 15.9 to 25.7 µg/L in six samples collected from the Colorado River at locations both upstream and downstream of the BCW. The June 2002 Cr(VI) results were inconsistent with prior and subsequent Cr(VI) analyses, including laboratory re-testing of the samples. Confirmation sampling at the same locations in August 2002 yielded non-detect results for Cr(VI). According to the data quality review for the June 2002 monitoring, there was indication of false-positive results caused by unidentified interference for these samples (CH2M HILL, 2009a). As further confirmation of the false-positive assessment, the same interference issue was also found in samples collected from three floodplain monitoring wells during the same sampling event which resulted in similar detections at normally non-detect wells. DTSC concurred no action should be taken or project decisions should be made based on the results and, thus, the data are not included in this GWRA.

3.2.2 Process for Identifying ICOPCs for Inclusion in the Risk Assessment

The following section describes the process used to identify ICOPCs that will be evaluated further in Section 4. Separate ICOPC lists were developed for: (1) evaluation of future hypothetical direct human exposure to groundwater (groundwater ICOPCs), and (2) evaluation of the potential for constituents in the floodplain wells to be released to the surface water (floodplain ICOPCs). The overall process for identifying ICOPCs is depicted in Figure 3-1 and is described more fully below.

In general, and consistent with the RAWP (ARCADIS, 2008), all constituents detected above a laboratory detection limit during the GMPs are considered for inclusion in the risk assessment process. Constituents that have been analyzed but not detected, in contrast, are eliminated from further discussion. A detailed discussion regarding the adequacy of analytical detection limits is described in Section 9.

As described above, Tables 3-4a through 3-4c identify those constituents that have been analyzed for, but not detected, in the background groundwater and site groundwater. Tables 3-6a and 3-6b identify those constituents that have been analyzed for, but not detected, in surface water. Consistent with standard risk assessment protocols and the approach set forth in the RAWP (ARCADIS, 2008), these non-detected constituents are determined to be not significant and will not be discussed further in this GWRA.

Total chromium is not included as an ICOPC for either the groundwater or surface water risk assessments and will not be considered further in the GWRA. Total chromium is the sum of trivalent and hexavalent chromium. Because trivalent chromium is relatively insoluble in site groundwater the total chromium measured in filtered site groundwater samples is composed almost entirely of hexavalent chromium (CH2M HILL, 2009a).

Chloroform was detected at trace levels in five groundwater samples, but is identified as a common laboratory contaminant in the RFI/RI Volume 2 (CH2M HILL, 2009a). Consistent with standard risk assessment protocols and the approach set forth in the RAWP (ARCADIS, 2008), chloroform is excluded

from further analysis based on its status as a common laboratory contaminant. Therefore, chloroform is not considered to be either a groundwater ICOPC or floodplain ICOPC. In addition to constituents that have not been detected at the site, there are a few constituents (two radiological compounds, four VOCs, and one PAH) that were detected infrequently in site groundwater and at very low concentrations (e.g., below drinking water criteria). Further, as described above in Section 3.2, there are an additional 13 general chemical parameters (categorized as "other inorganic compounds" in this GWRA) that DTSC and USDOI requested be carried through a screening-level evaluation in order to ascertain whether they should be included in the quantitative risk assessment. As agreed with DTSC and USDOI (ARCADIS, 2009), a screening-level evaluation for these 13 constituents, in addition to the other infrequently detected constituents, is presented in Appendix D and summarized in Figure D-1.

The screening-level evaluation presented in Appendix D and summarized in Figure D-1 comprises two separate analyses: (1) a human health groundwater screening evaluation; and (2) a groundwater-to-surface water transport screening evaluation. Other constituents that "pass" (are not excluded by) the human health groundwater screening evaluation presented in Appendix D are included as groundwater ICOPCs. Other constituents that pass the groundwater-to-surface water transport screening evaluation are included as floodplain ICOPCs. The two screening evaluations are very similar; the differences between the two screening evaluations may be summarized as follows.

- The human health groundwater screening evaluation compares maximum detected constituent concentrations in *site-wide* groundwater to various screening criteria; whereas the groundwater-to-surface water transport screening evaluation compares maximum detected constituent concentrations in *floodplain* groundwater to various screening criteria.

- The groundwater-to-surface water transport screening evaluation incorporates ecological screening criteria; whereas the human health groundwater screening evaluation does not.

The human health groundwater screening evaluation presented in Appendix D indicates that fluoride and nitrate as nitrogen should be included as groundwater ICOPCs and carried forwards to the groundwater COPC selection processes described in Section 4. Specifically, fluoride and nitrate as nitrogen are identified as groundwater ICOPCs in Appendix D based on their presence in site groundwater at concentrations greater than drinking water standards.

The groundwater-to-surface water transport screening evaluation presented in Appendix D indicates that ammonia, chloride, fluoride, iron, and nitrate as nitrogen should be included as floodplain ICOPCs based on their potential to be transported from the floodplain groundwater to the surface water. Specifically, fluoride and nitrate as nitrogen are defined as floodplain ICOPCs because their maximum detected concentrations in floodplain groundwater exceed drinking water criteria; while ammonia, chloride, and iron are defined as

floodplain ICOPCs because their maximum detected concentrations in floodplain groundwater exceed ecological criteria.

In summary, the following constituents are defined as groundwater ICOPCs and are carried forwards to the well-specific groundwater COPC selection processes described in Sections 4.1.1 through 4.1.2:

- Hexavalent chromium
- 17 metals consisting of aluminum, antimony, arsenic, barium, beryllium, cadmium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc
- Fluoride
- Nitrate (as nitrogen).

In summary, the following constituents are defined as floodplain ICOPCs and are carried forwards to the floodplain COPC selection process described in Sections 4.1.1 and 4.1.3.

- Hexavalent chromium
- 17 metals consisting of aluminum, antimony, arsenic, barium, beryllium, cadmium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc
- Ammonia (as nitrogen)
- Chloride
- Fluoride
- Iron
- Nitrate (as nitrogen).

As summarized above, the groundwater ICOPC list is very similar to the floodplain ICOPC list. The floodplain ICOPC list contains three additional constituents—ammonia, chloride, and iron—whose inclusion is based on a comparison to ecological criteria.

3.2.3 General Discussion of Groundwater Sampling Results

The following section provides a general discussion of the background and site groundwater sampling results.

3.2.3.1 Background Groundwater

Table 3-7a presents the key summary statistics for the background data relevant to evaluation of groundwater and floodplain ICOPCs. As indicated in Table 3-7a (see Note 2), all inorganic compounds, except cadmium and mercury, were detected in the groundwater background dataset. Antimony, beryllium, cobalt, lead, silver, and thallium were detected in the background study in 15% or fewer of the samples, with reported detection frequencies of 0.67, 0.67, 2.7, 15, 5.4, and 2.7%, respectively. The calculated background UTLs for these constituents, therefore, are largely impacted by the analytical reporting limits (in fact, note that the calculated background UTLs are below the typical reporting limits for antimony, beryllium, cobalt, silver, and thallium). All other inorganic compounds were detected in the background dataset between 18 and 100% of the samples.

3.2.3.2 Site Groundwater

Table 3-7b presents the key summary statistics for groundwater ICOPCs in site-wide groundwater. As indicated, the groundwater ICOPCs detected in fewer than 15% of total samples that were analyzed include: aluminum, antimony, beryllium, cadmium, cobalt, lead, mercury, sliver and thallium. Ammonia and iron were detected in 21% and 22% of the samples, respectively; and all other constituents were detected in more than 34% of the samples.

3.2.3.3 Floodplain Groundwater

Table 3-7c presents the key summary statistics for floodplain ICOPCs in floodplain groundwater (i.e., in the subset of site wells that are within the floodplain, as described above in Section 3.2.1.3). As indicated, aluminum, antimony, beryllium, cadmium, mercury, silver, and thallium were detected in the floodplain area in fewer than 10% of the samples. In contrast, barium, chloride, fluoride, molybdenum, vanadium, and zinc were detected in the floodplain wells in more than 50% of the samples.

3.2.4 Surface Water

Table 3-8a presents the key summary statistics for floodplain ICOPCs in the upstream surface water samples, and Table 3-8b presents the key summary statistics for floodplain ICOPCs detected in the downstream surface water samples. As indicated, ammonia, barium, chloride, fluoride, molybdenum, nitrate as nitrogen, vanadium, and zinc were detected in the upstream sampling locations, in more than 50% of the

samples. Hexavalent chromium and iron were not detected in the upstream sampling locations. Similarly, barium, chloride, fluoride, molybdenum, nitrate as nitrogen, vanadium, and zinc were detected in the downstream sampling locations, in more than 50% of the samples; whereas, with one exception described in Section 3.2.1.4, hexavalent chromium and iron were not detected in the downstream sampling locations. As previously described, the one exception is a low detection of hexavalent chromium, which was believed to be associated with the presence of hexavalent chromium in the laboratory buffer solution and, therefore, not site-related.

3.3 Data Usability

As stated in the RAWP (ARCADIS, 2008), the data usability criteria used to confirm that the dataset presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) are suitable for risk assessment (USEPA, 1992) include: (1) data sources, (2) documentation, (3) analytical methods and detection limits, (4) data review, and (5) data quality indicators. The evaluation of the analytical data with respect to these data usability criteria are discussed in the RFI/RI Volume 2 (CH2M HILL, 2009a). The following sections contain a brief discussion of the data usability criteria. Additionally, the specific approaches for the management of non-detect results, field duplicate samples, and multiple analytical methods for a constituent are also presented below. As requested by USDOI, a data usability matrix is presented in Appendix E, which summarizes various aspects of data usability on an aggregated, site-wide basis for each COPC. It should be noted that much of the relevant information presented in this summary analysis is presented and discussed in Sections 3.3 and 9.

3.3.1 Data Sources

The data source review evaluates the analytical methods performed on the sample with respect to site-use information. The objective of the data source review is to ensure that the appropriate analytical methods were used to identify all relevant and significant constituents for the environmental media of interest.

As discussed in the RFI/RI Volume 2 (CH2M HILL, 2009a), since 1997, an extensive set of work plans, sampling/analysis/monitoring plans, QA and data management plans, and methods and procedures have been developed for the RFI/RI data collection and analysis. All work plans and sampling/analysis/monitoring plans were developed specifically to understand the nature and extent of impacts that could have resulted from historical operations and incorporated the appropriate available analytical methods to achieve such objectives. Accordingly, as stated in the RFI/RI Volume 2 (CH2M HILL, 2009a), the sampling and analysis of the groundwater and surface water, which has been conducted since 1997 under the direction of DTSC and since 2004 under the direction of both USDOI and DTSC, have appropriately targeted the constituents of interest with the appropriate analytical methods.

The entire PG&E Topock analytical program was specifically designed to ensure that field investigation data collected are of the appropriate quality required to support decision making in the RFI. The frequency, quantity, and type of analyses required to achieve the data quality objectives are specified in the program-specific work plans, work plan amendments, and additional specific sampling and analysis plans, all of which were approved by the agencies prior to the initiation of the investigations. (The list of applicable plans and procedure documents used for the RFI/RI Volume 2 [CH2M HILL, 2009a] is presented in Table 4-1 of that document.)

Appendix H1 of the RFI/RI Volume 2 (CH2M HILL, 2009a) discusses the PG&E Topock analytical program, designed to ensure that field investigation data are of the appropriate quality to support decision making in the RFI/RI. Data that are found to lack the appropriate quality are rejected (R-flagged) during the data evaluation process and are excluded from evaluation in this report. Attachment 1 included in Appendix H1 of the RFI/RI Volume 2 discusses the QA/QC of the data during the time period from 1997 to 2004 (date of a prior version of the RFI/RI Report). The body of Appendix H1 of the RFI/RI Volume 2 discusses the quality of the data during the time period of 2002 to 2007. In addition to the laboratory requirements listed in Table 4-1 of the RFI/RI Volume 2, statements of work were prepared detailing the minimum QA/QC requirements for laboratory analyses. The *Quality Assurance Project Plan* (QAPP) and the *Quality Assurance Project Plan Addendum* (QAPP Addendum) (CH2M HILL, 2004a,b) document the QA/QC activities that have been used in generating analytical data for the groundwater monitoring program and further define the analytical requirements for the Topock analytical program. As discussed in Appendix H1 of the RFI/RI Volume 2 (CH2M HILL, 2009a), the quality of the data is evaluated by criteria that include precision, accuracy, representativeness, completeness, and comparability. In addition to these QA/QC protocols, performance and system audits, data validation, data management, and management of historic data were performed to ensure the quality of the RFI/RI dataset.

3.3.2 Documentation

The documentation review evaluates the manner in which samples were managed by the field sampling teams and receiving laboratories. The objective of this review is to ensure that analytical results can be associated with specific sampling locations and that the appropriate procedures were used to collect the environmental samples.

The data included in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) are generally limited to data collected by PG&E and its consultants, in accordance with agency-approved plans and procedures and in conformance with data QC programs. Data collected by MWD is the exception.

The specific protocols for sampling, equipment decontamination, handling of investigation-derived wastes, sample handling and storage, chain-of-custody requirements, and field QC are all discussed in the *Sampling, Analysis, and Field Procedures Manual* (Field Procedures Manual; CH2M HILL, 2005d).

Requirements for laboratory analyses, data handling, data evaluation and assessment performance evaluations, corrective actions, and preventive maintenance of equipment are specified in the QAPP (CH2M HILL, 2004b). Accordingly, there is a high degree of confidence that the results obtained from these sampling programs can be associated with the sampling locations specified in the work plans and reports; and that the appropriate procedures, specified in the Field Procedures Manual and the QAPPs, were followed.

3.3.3 Analytical Methods and Detection Limits

The groundwater and surface water data were evaluated and compared, in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b), to background concentrations (i.e., the background UTLs established in the Groundwater Background Study [CH2M HILL, 2008a,b] and to applicable drinking water criteria (maximum contaminant levels [MCLs]), in order to understand whether there are any significant limitations of the existing dataset. For constituents that had high reporting limits in several samples that affected the statistics, the reporting limits were examined in greater detail in the RFI/RI Volume 2, and the conclusions on the constituents drawn based on that understanding. The comparison of the groundwater detection limits to risk-based concentrations (RBCs), and a discussion of the adequacy of the detection limits to make health-protective decisions regarding the potential groundwater-to-surface water transport pathway, are presented as part of this GWRA and are discussed below and in Section 9.

3.3.3.1 Groundwater: Comparison of Analytical Detection Limits to Background Upper Tolerance Limits

Table 3-9 identifies the number of samples for each metal (with a background UTL developed by the Groundwater Background Study [CH2M HILL, 2008b]) in groundwater that were reported as non-detects (not present above the analytical detection limit), and the number of non-detect samples that are greater than the background UTL. As indicated in Table 3-9, there are eight constituents for which more than 50% of the samples reported as non-detect contain detection limits that exceed the associated background UTL. These constituents are: antimony, barium, beryllium, cobalt, lead, nickel, silver, and thallium. These constituents were all reported as non-detect in more than 50% of the total samples.

Given that there are eight constituents that were reported as non-detect in a large percentage (i.e., greater than 50%) of the samples, and that a large percentage of the detection limits for these eight constituents are elevated above the background UTLs, there is uncertainty with respect to these eight constituents regarding the ability to conservatively assess and determine whether these constituents are present at individual wells at concentrations below background. A more detailed discussion on the potential implication of the detection limits that exceed the background UTLs on the COPC selection process (discussed in Section 4) is provided in the uncertainties section of this GWRA (Section 9).

3.3.3.2 Groundwater: Comparison of Analytical Detection Limits to Drinking Water Criteria

As stated in the RFI/RI Volume 2 (CH2M HILL, 2009a), sample data are of the appropriate quality to support decision making in the RFI/RI. Additional discussion on the adequacy of the analytical detection limits in the various stages of the risk assessment process is presented in Section 9.

3.3.3.3 Surface Water: Comparison of Analytical Detection Limits to Surface Water Criteria

As described in the RAWP (ARCADIS, 2008), the process of assessing whether constituents in groundwater could represent a significant impact on the adjacent surface water body consists of a two-step process in which the concentration in groundwater wells located in the floodplain area, adjacent to the river, are first compared to surface water criteria. If the concentration in the floodplain wells exceeds applicable surface water criteria, an evaluation of the actual concentrations in the surface water is conducted. This analysis is presented in Section 4.2. The adequacy of the analytical detection limits for assessing the significance of the groundwater-to-surface water transport pathway is discussed in the uncertainty section (Section 9).

3.3.4 Data Review and Validation

As described in Appendix H of the RFI/RI Volume 2 (CH2M HILL, 2009a), data validation was performed to ascertain the quality of the analytical data generated for the RFI/RI. For data collected prior to 2002, data validation occurred consistent with the data quality indicators specified in the SAP (CH2M HILL, 2004a) and was presented in the *Draft RCRA Facility Investigation Report* (E&E, 2004). The QAPP (CH2M HILL, 2004b) documents the QA/QC activities that have been used in generating analytical data for the GMP beginning in 2004 and further define the analytical requirements for the Topock analytical program. Specifically, as stated in the RFI/RI Volume 2 (CH2M HILL, 2009a), the QAPP (CH2M HILL, 2004d) outlines the procedures used to validate data from the GMP beginning in April 2004, which include the following:

- Review of the data package for completeness
- Review of chain-of-custody records for discrepancies that might degrade data quality
- Review for compliance with holding time and QC frequency requirements
- Evaluation of all calibration and QC summary results against the project requirements
- Verification of analyte identification and calculations for at least 10% of the data

- Qualification of the data using appropriate qualifier flags, as necessary, to reflect data usability limitations
- Initiation of corrective actions, as necessary, based on the data review findings.

Occasionally, data required qualifying for analytical uncertainties, which included but are not limited to:

- The precision and accuracy limits were not achieved.
- The analysis exceeded the sample holding time.
- The field duplicate exceeded relative percent difference criteria.
- Calibration requirements were not met.
- Low-level laboratory or field contamination occurred.
- The reporting limits for U.S. Environmental Protection Agency (USEPA) Method SW7199 were not achievable due to matrix interference.
- A detected peak was not within the laboratory-established retention time window for USEPA Method SW7199.

Data that did not meet QC requirements were qualified during data validation to alert data users to the uncertainty associated with the result. Data validation for data collected after 2002, but prior to the submittal of the QAPP in 2004, was based on the criteria set by the USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA, 1994) and the *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, 1999), as stated in the RFI/RI Volume 2 (CH2M HILL, 2009a).

Overall, the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) conclude that the data included in the RFI/RI and Addendum are of acceptable quality, except where noted, and the completeness objectives were accomplished. Data that were rejected through the data validation process were not incorporated into data discussions presented in the RFI/RI and are not included in the quantitative risk assessment. Of note, however, is that it appears that only 0.6% of the data collected at the site were actually rejected. Such a low overall rejection rate is a strong indication that the overall data quality assessment and QC requirements set forth in the QAPP (CH2M HILL, 2004b) are being met, resulting in a large and very robust dataset that meets the data quality objectives set forth for the project.

Of the data incorporated into this GWRA (summarized in Appendices A through C), approximately 1,000 groundwater samples and approximately 165 surface water samples are qualified with J flags; a J flag indicates that the value reported in that sample is an estimated value (and could be an underestimate of the actual value). These J-flagged samples comprise roughly 3% and 5% of the total groundwater and surface water dataset, respectively. As stated in the RAWP (ARCADIS, 2008), and consistent with standard risk assessment guidance, all J-flagged values are used in the quantitative risk assessment. However, because the number of J-flagged samples represents a relatively small percentage of the data as a whole, it is unlikely that use of the very limited number of estimated samples in this GWRA introduces material uncertainty into the overall conclusions of this GWRA.

3.3.5 Data Quality Indicators: Representativeness, Completeness, and Comparability

As described in the RAWP (ARCADIS, 2008), data representativeness is the degree to which sample data accurately reflect the characteristics of a population of samples. Representativeness is generally achieved through a well-designed sampling program (e.g., appropriately placing samples to reveal potential releases, and analyzing for all constituents potentially related to site activities) using standardized sampling strategies, techniques, and analytical procedures. Factors that can affect representativeness include site homogeneity, sample homogeneity at a single location, and available information around which the sampling program is designed. As stated in the RFI/RI Volume 2 (CH2M HILL, 2009a), representativeness for the RFI/RI was maintained through the use of a well-designed sampling program developed using available historical data with input and approval from the relevant regulatory agencies, and through the use of standardized analytical methods and consistent field procedures.

Completeness relates to whether enough sample results are retained after validation to adequately characterize the investigational unit. Completeness refers to the amount of valid measurements compared to the total amount generated for each method, matrix, and analyte combination. As described in the RFI/RI Volume 2 (CH2M HILL, 2009a), the completeness of the data collected by Ecology and Environment (E&E; prior to 2002) and by CH2M HILL (2002 until present) is documented through reports and/or data quality evaluation memos. The completeness goal for the project, as specified in the QAPP (CH2M HILL, 2004b), is 95%. Based on the very limited amount of data that were rejected and the relatively small percent of the dataset as a whole that represents qualified data (e.g., qualified as estimated with a “J flag”), it would appear that the completeness goals set forth in the QAPP (CH2M HILL, 2004b) have been achieved.

Comparability expresses the confidence with which data are considered to be equivalent. Combined datasets are regularly used to develop quantitative estimates of risk. In the RFI/RI, groundwater and surface water data collected prior to 2002 by E&E are combined with data collected since 2002 by CH2M HILL. Typical issues to consider in determining analytical comparability include questions regarding the analytical methodologies, detection limits, laboratories, and units of measurement. As described in the RFI/RI Volume 2 (CH2M HILL, 2009a), system audits performed by E&E and CH2M HILL provide additional

information for assessing the comparability of data among participating subcontractor laboratories. E&E's primary performance control was a supplemental statement of work for Applied P&Ch Laboratory to continue the analytical services audited by Alisto in November 1996. Applied P&Ch Laboratory was the prime lab used by E&E in the pre-2002 time period.

CH2M HILL performed onsite audits of Truesdail Laboratories, Inc. in July 2004, April 2005, and October 2007. Truesdail Laboratories, Inc. has been the primary laboratory used by CH2M HILL, with Zymax, EMAX, STL, ATL, and ASL being secondary or specialty laboratories. Additionally, a continuous paper audit was systematically performed by CH2M HILL during routine data validation over the course of the project. Results of the system and performance audits, as discussed in the RFI/RI Volume 2 (CH2M HILL, 2009a), indicate that the different laboratories used over the course of the project were compliant with the statements of work and the QAPP. For these reasons, data collected over the course of the 10-year investigation period are generally considered to be comparable, within the general limitations expressed during the individual data validation efforts. The overall strengths and weaknesses of the dataset for individual constituents/monitoring wells, etc., are discussed in the risk characterization (Section 7) and uncertainties section (Section 9).

3.3.6 Management of Non-Detect Data

In accordance with the RAWP (ARCADIS, 2008), EPCs are calculated for individual groundwater wells and for groups of groundwater wells (e.g., floodplain wells). In accordance with USEPA risk assessment guidance (USEPA, 1989), the EPC does not represent the maximum concentration that could be contacted at any one time, but rather represents a reasonable estimate of the concentration likely to be contacted over time; due to the uncertainty associated with estimating average exposure concentration, the EPC is typically calculated as the 95% upper confidence limit (95% UCL) of the mean (OTM) concentration. Thus, for each dataset (i.e., measured concentrations of a particular constituent at a particular well or group of wells), the EPC is calculated as the 95% UCL OTM concentration, where possible; otherwise, the EPC is conservatively assumed equal to the maximum detected concentration in the dataset.

In accordance with the RAWP (ARCADIS, 2008), the calculation of 95% UCLs and other statistical analyses are performed using the USEPA statistical software package ProUCL Version 4.00.02 (ProUCL 4.0) (USEPA, 2007a). ProUCL 4.0 is an upgrade of ProUCL Version 3.0 and contains statistical methods for evaluation of full environmental datasets without non-detect values, as well as specific statistical methods for evaluation of datasets with non-detect values (also known as left-censored datasets). In order for ProUCL 4.0 to reliably evaluate a specific dataset (e.g., concentrations of a particular constituent measured in a particular well), the dataset must include at least eight results including at least five detections. If the dataset does not meet these criteria, ProUCL 4.0 cannot reliably process the data, and the EPC is conservatively assumed to be the maximum detected concentration in the dataset. Thus, prior to calculation of EPCs with ProUCL 4.0, each constituent dataset is screened with respect to sample size and number of detections as follows.

- If every result in the dataset is a non-detect (i.e., if the analyte was not detected in any sample collected from the given monitoring well or group of wells), the analyte is assumed to not be present at the location/area, and an EPC is not calculated.

- If the number of samples in the dataset is fewer than eight, the maximum detected concentration is used as the EPC.

- If the number of detections in the dataset is fewer than five, the maximum detected concentration is used as the EPC.

If the constituent dataset meets the minimum criteria of eight results including five detections, the data distribution type (e.g., normal, lognormal, or other nonparametric distribution) is determined using ProUCL 4.0, and the 95% UCL OTM concentration is calculated by ProUCL 4.0 using methodology appropriate for the distribution type. ProUCL 4.0 can calculate UCLs using up to 15 different parametric and nonparametric statistical methods. Some of the methods (e.g., Kaplan-Meier method, regression-on-order methods) are applicable to left-censored datasets having multiple detection limits. The optimal method(s) for a particular dataset are identified by the ProUCL 4.0 software based on USEPA numerical experiments with hypothetical datasets with a wide range of statistical properties, such as distribution shape, sample size, percent non-detects, and skewness (USEPA, 2007a). The ProUCL 4.0 output reports for calculation of 95% UCLs are presented in Appendix F.

3.3.7 Management of Field Duplicate Data and Multiple Analytical Techniques

As stated in the RAWP (ARCADIS, 2008), for cases where a field duplicate sample is present, a single representative concentration for the sample was selected generally consistent with USEPA guidance regarding data verification, data validation, and data quality assessment (USEPA, 1992; 2002a). These procedures included the following:

- If there were detections in both samples, the higher concentration was selected.

- If there was a detection in one sample but not the other, the detected concentration was selected.

- If there was not a detection in either sample, the lowest method detection limit was selected and appropriate techniques for handling non-detect data were applied in calculating statistics (see Section 3.3.6).

4. Identification of Constituents of Potential Concern

As was described in Section 3, in general, those constituents that are applicable to human or ecological health and have been detected at least once at the site are defined as ICOPCs and are passed forward to the COPC selection processes described in this section. Separate ICOPC lists were developed for evaluating direct human exposure to groundwater (groundwater ICOPCs), as well as the potential for constituents in the floodplain wells to be released to the surface water (floodplain ICOPCs). This section presents a series of sequential screening steps, or "filters," in which the ICOPCs identified in Section 3.2.2 are evaluated for inclusion as COPCs in the quantitative risk assessment. The steps described in this section are consistent with the approach set forth in the RAWP (ARCADIS, 2008).

4.1 Groundwater

In accordance with the RAWP (ARCADIS, 2008), the selection of COPCs in site groundwater is a sequential process where constituents detected in site groundwater may be eliminated from further consideration if present at concentrations deemed to be consistent with ambient background conditions. COPCs in site groundwater are defined here in two contexts.

- **Well-Specific COPCs:** COPCs are defined for each site groundwater well individually. These well-specific COPCs are selected from the list of groundwater ICOPCs defined in Section 3.2.2, and are the basis of the well-specific human health risk assessment (HHRA) presented in Section 7.2.

- **Floodplain COPCs:** COPCs are defined on a site-wide basis, with all data from the site groundwater wells grouped together. These floodplain COPCs are selected from the list of floodplain ICOPCs defined in Section 3.2.2, and are the basis of the groundwater-to-surface water transport evaluation presented in Section 4.2.

The general process for determining whether ICOPCs are present above background concentrations and are, therefore, COPCs, is described below in Section 4.1.1. The results of the comparison process are presented in Sections 4.1.2 and 4.1.3 for well-specific COPCs and floodplain COPCs, respectively.

4.1.1 Process for Comparing Site Concentrations to Background Concentrations

The process for determining whether constituents detected in site groundwater are consistent with background concentrations consists of a series of statistical tests, in which concentrations of constituents detected in the groundwater are compared to the concentrations measured as part of the background study. As was described in the RAWP (ARCADIS, 2008), there is no single statistical test that can be used to determine when concentrations in groundwater are equivalent to background concentrations. Rather, there are several tests that may be used to support this determination. The sequential screening process for

evaluating whether a constituent is present above background levels is described in the following section. The general process is the same whether the comparison is occurring on an individual well basis (needed for the well-specific HHRA) or on a site-wide basis with all data from the site groundwater wells grouped together (needed for the groundwater-to-surface water transport evaluation).

Step 1: Maximum versus Background Upper Tolerance Limit. The historical maximum detected concentration of the constituent is compared to the background UTL of that chemical. If the maximum is less than the background UTL, the constituent is determined to not be present above background levels and is excluded as a COPC, as discussed in Section 3.3.1.1.1 of the RAWP (ARCADIS, 2008). If the maximum is greater than or equal to the background UTL, or if the constituent does not have a background UTL, the evaluation of the constituent proceeds to Step 2.

Step 2: Number of Results and Number of Detections. If the maximum fails the UTL screen discussed above (i.e., if the maximum is greater than or equal to the background UTL), the constituent is evaluated further. In this step, the number of results and number of detections for retained constituents is checked to see if the data are sufficient to support statistical testing using the Quantile Test and the Mann-Whitney or Gehan Test. As noted in Section 3.2.7 of the RAWP (ARCADIS, 2008), statistical evaluations of site and background data are performed with the USEPA statistical software package ProUCL 4.0. In order for ProUCL 4.0 to reliably evaluate a specific data population (e.g., dataset of concentrations of a particular constituent measured in a particular well), the population must include at least eight results including at least five detections. If the constituent dataset contains fewer than eight results or fewer than five detections, reliable statistical evaluations of the data cannot be conducted, and the constituent is conservatively included as a COPC at an EPC equal to the historical maximum detected concentration.

If the constituent dataset is sufficiently robust to conduct meaningful statistical evaluations (and process with ProUCL 4.0), both the Quantile and the Mann-Whitney or Gehan Test are run to evaluate if the site data (i.e., dataset of concentrations of a particular constituent measured either in a particular well or in all site wells) are lower than or equal to background data. If both the Quantile Test and the Mann-Whitney or Gehan Test support the null hypothesis that the site data are lower than or equal to the background data, the constituent is excluded as a COPC; otherwise, the constituent is determined to be a COPC. These population tests are discussed in more detail in Steps 3 and 4 below. A significance level of 0.05 (an alpha of 0.05) is used for all population tests as the basis for rejecting the null hypothesis and concluding that the constituent is present above background levels.

Step 3: Quantile Test. The Quantile Test is used to evaluate if the upper tails of two distributions are comparable, or if one of the populations has a higher proportion of samples in the upper quantile than the other population. The Quantile Test compares the two populations (e.g., the constituent data from an individual well [or all site wells] and the constituent data from the background dataset) and tests the null hypothesis: that the site dataset is lower than or equal to the background dataset. To do this, the Quantile

Test combines the two datasets into a single population, ranks values from low to high, examines the values at the upper end (i.e., tail) of the combined distribution, and comes to a conclusion regarding the null hypothesis based on the presence of site values and/or background values in the upper tail of the distribution.

The three possible outcomes of the Quantile Test are: (1) reject the null hypothesis, (2) do not reject the null hypothesis and evaluate further using the Mann-Whitney Test or Gehan Test, or (3) inconclusive. If the null hypothesis is rejected, the constituent is assumed to be present above background levels, and the constituent is included as a COPC. If the Quantile Test is inconclusive, which can occur when the upper tail of the distribution contains non-detect values, the constituent is conservatively assumed to be present above background levels, and the constituent is included as a COPC. If the Quantile Test concludes to not reject the null hypothesis, the evaluation of the constituent proceeds to Step 4.

Step 4: Mann-Whitney Test or Gehan Test. If the Quantile Test concludes that the null hypothesis cannot be rejected, the results of either the Mann-Whitney Test or the Gehan Test are evaluated. These population tests are each described below. The criteria for selecting the appropriate test are the frequency of non-detect results and the presence of multiple detection limits in the two datasets. Consistent with USEPA statistical guidance (USEPA, 2007a), the Mann-Whitney Test is employed if the frequency of non-detect results is less than or equal to 40% in both the background and site datasets, and the combined dataset contains a single detection limit. Conversely, the Gehan Test is performed if the frequency of non-detect results is greater than 40% in either dataset, or if the combined dataset contains multiple detection limits.

- Mann-Whitney Test. The Mann-Whitney Test is a nonparametric test for assessing whether two samples of observations come from the same distribution. Specifically, the Mann-Whitney Test compares the two populations and tests the null hypothesis: that the site dataset is lower than or equal to the background dataset. The Mann-Whitney Test combines the two datasets into a single population, ranks values from low to high, examines the values at the center of the combined distribution, and comes to a conclusion regarding the null hypothesis based on the presence of site values and/or background values at the center of the distribution. The two possible outcomes of the Mann-Whitney Test are: (1) reject the null hypothesis, or (2) do not reject the null hypothesis. If the null hypothesis is rejected, the constituent is assumed to be present above background levels, and the constituent is included as a COPC. If the null hypothesis is not rejected, the constituent is assumed to not be present above background levels, and the constituent is excluded as a COPC.

- Gehan Test. Analogous to the Mann-Whitney Test, the Gehan Test combines and ranks the individual well constituent data with the background constituent data to compare values at the center of the distribution. The Gehan Test is preferred to the Mann-Whitney test for comparing populations with multiple detection limits or with large proportions of non-detects. The two possible outcomes of the Gehan Test are: (1) reject the null hypothesis, or (2) do not reject the null hypothesis. If the null

hypothesis is rejected, the constituent is assumed to be present above background levels, and the constituent is included as a COPC. If the null hypothesis is not rejected, the constituent is assumed to not be present above background levels, and the constituent is excluded as a COPC.

As set forth in the RAWP (ARCADIS, 2008), the statistical evaluation process described above is conservatively designed to exclude from this GWRA only those constituents that are clearly present at or below background levels. The process is intended to err on the conservative side of including constituents into this GWRA rather than excluding them. In summary, a constituent is only excluded if: the maximum detected concentration of the constituent is less than the background UTL; or both the Quantile Test and the Mann-Whitney or Gehan Test support the null hypothesis that the data are lower than or equal to the background data. Otherwise, the constituent is determined to be a COPC.

4.1.2 Determination of Well-Specific COPCs

COPCs in site groundwater are selected on an individual-well basis for each of the 168 site groundwater wells (see well list in Table 3-3). The purpose of defining COPCs for each individual well is to establish the list of constituents that will be carried through to the HHRA[9] for that well (see Section 7.1). The selection process for each well-specific COPC begins with an evaluation of the groundwater ICOPCs detected at that well. The process for defining well-specific COPCs is depicted in Figure 4-1. The list of groundwater ICOPCs detected in each site well is provided in Table 4-1a.

The results of Step 1 (maximum versus background UTL) of the background comparison for the well-specific ICOPCs are presented in Table 4-1a. The results of the Quantile test (Step 3), Mann-Whitney Test (Step 4), and Gehan Test (Step 4) for the individual wells are presented in Table 4-1b, and the ProUCL 4.0 output reports are included in Appendix F.

For each site groundwater well, those constituents that are determined to be well-specific COPCs are listed in Table 4-2 with their associated representative EPCs. As discussed further in Section 5.4, the EPC is a conservative estimate of the average constituent concentration in the exposure medium (in this case, well-specific groundwater) to which a receptor could theoretically be exposed. For the well-specific HHRA, each EPC is either the 95% UCL OTM concentration, as calculated by ProUCL 4.0, or the maximum detected concentration if the constituent dataset from the individual well is too limited for calculating a 95% UCL (i.e., cannot be reliably processed with ProUCL 4.0 due to having less than eight results or less than five detections).

[9] The individual well risk assessment is focused on human health. Potential ecological risks associated with groundwater concentrations are considered in Section 4.2, Groundwater-to-Surface Water Transport Evaluation, and Appendix I.

Use of maximum detected constituent concentrations as the EPC is the most conservative assumption that can be made with the available data and generally not considered a reliable estimate of the long-term representative concentration to which an individual could be exposed. Accordingly, a sensitivity analysis has been conducted in order to understand whether the use of the arithmetic average concentration at a given well would provide a materially different answer as to the significance of a constituent at a particular well in comparison to the use of the maximum concentration. The sensitivity analysis, presented in Appendix G and discussed more thoroughly in Section 7, will help bound the estimate of hypothetical potential future risk and hazard at a given well, and will provide the risk managers with an understanding of the sensitivity of relying upon maximum concentrations to the overall characterization of hypothetical future risks and hazards estimated for each well. As discussed with the agencies, the sensitivity analysis provides important information as it allows risk managers to better understand whether estimated risks/hazards are based on limited or robust quantities of data. Although informative to the risk managers, the sensitivity analysis is not used to eliminate COPCs from the GWRA or to reach conclusions as to whether a particular chemical is a COC that should be carried forward to the CMS/FS.

The well-specific COPCs and associated EPCs documented in Table 4-2 are ultimately carried forward into the well-specific HHRA, as presented in Section 7.2.

4.1.3 Determination of Floodplain COPCs

The purpose of identifying floodplain COPCs is to determine the list of constituents that will be considered in the evaluation of whether there could be significant transport of site-related constituents to the surface water of the Colorado River (see Section 4.2). The process followed for selection of floodplain COPCs is depicted in Figure 4-2 and is nearly identical to that followed for selection of well-specific COPCs, described above in Section 4.1.2 (i.e., the sequence of steps and the statistical analyses performed at each step are the same). The only two differences are the following: (1) in the well-specific evaluation, only constituent data from the individual wells are evaluated against the background dataset; whereas in the floodplain evaluation, constituent data from all site wells combined are evaluated against the background dataset; and (2) the use of the floodplain ICOPC list instead of the groundwater ICOPC list, as defined in Section 3.2.2. As noted, the groundwater ICOPC list is very similar to the floodplain ICOPC list; the floodplain ICOPC list contains three additional constituents—ammonia, chloride, and iron—whose inclusion is based on a comparison to ecological criteria.

Step 1 in the screening process, comparison of each site maximum concentration to the associated background UTL, is documented in Table 4-3. No floodplain ICOPCs are excluded at this step, as the maximum concentration of every floodplain ICOPC detected anywhere across the site is greater than the associated background UTL. Step 2 of the screening process considers whether there are enough site data (at least eight results including at least five detections) to conduct meaningful statistical evaluations; this criterion is met for all floodplain ICOPCs. Steps 3 and 4 of the screening process, comparison of the site and

background populations using the Quantile Test and the Mann-Whitney or Gehan Test, respectively, are also summarized in Table 4-3; the associated ProUCL 4.0 output reports are included in Appendix F.

Those floodplain ICOPCs that are determined to be floodplain COPCs for the groundwater-to-surface water transport evaluation are listed in Table 4-4 and analyzed further in Section 4.2. Those floodplain ICOPCs that are determined to not be present above background levels are excluded from the groundwater-to-surface water transport evaluation.

4.2 Groundwater-to-Surface Water Transport Evaluation

In accordance with the RAWP (ARCADIS, 2008), the evaluation of whether there could be significant transport of site-related constituents to surface water (i.e., the Colorado River) is based on a series of screening evaluations. The potential transport to surface water is evaluated here for those constituents determined to be floodplain COPCs, as described in Section 4.1.3. In summary, the determination of whether the groundwater-to-surface water transport pathway could be complete and significant is based on the following general sequential steps, consistent with the approach set forth in the RAWP:

- Step 1: Comparison of concentrations of constituents in floodplain wells to surface water criteria. If the EPC of a constituent in floodplain groundwater is lower than its surface water criterion, the constituent is excluded from further consideration with respect to transport to surface water. If the EPC of a constituent in floodplain groundwater exceeds its surface water criterion, the evaluation of the constituent proceeds to Step 2.

- Step 2: Comparison of concentrations of Step 1 constituents in downstream surface water to surface water criteria. If the EPC of a constituent in downstream surface water is lower than its surface water criterion, the constituent is excluded from further consideration with respect to transport to surface water. If the EPC of a constituent in downstream surface water exceeds its surface water criterion, the evaluation of the constituent proceeds to Step 3.

- Step 3: Comparison of concentrations of Step 2 constituents in downstream surface water to upstream (i.e., background) surface water. If the concentrations of a constituent measured in downstream surface water are lower than measured in upstream surface water, the constituent is excluded from further consideration with respect to transport to surface water. If the concentrations of a constituent measured in downstream surface water are greater than those measured in upstream surface water, the constituent is carried forward into a quantitative surface water human health and ecological risk assessment.

These are sequential "filters" by which floodplain COPCs may be excluded from further consideration with respect to transport to surface water. A constituent that passes through all three of these filters would be carried forward into a quantitative surface water human health and ecological risk assessment.

These screening evaluations are described below and are summarized in Figure 4-3. The constituents included in this groundwater-to-surface water transport evaluation are those constituents determined to be floodplain COPCs, as discussed in Section 4.1.3 and as listed in Table 4-4.

4.2.1 Step 1: Comparison of Floodplain Concentrations to Surface Water Criteria

To evaluate the completeness and significance of the groundwater-to-surface water transport pathway, the subset of the site groundwater wells within the floodplain was separated out from the other site wells. The reason for this separation is that the floodplain area is geographically in close proximity to the Colorado River, and concentrations of constituents in the floodplain area provide the best representation of the quality of groundwater that potentially could be released to the Colorado River. For purposes of the groundwater-to-surface water transport evaluation, "floodplain" is defined as all wells located east of National Trails Highway (also known as Route 66 and Park Moabi Road), as identified on Table 3-3. Considering only groundwater data from the floodplain wells, an EPC of each constituent in floodplain groundwater is established as either the 95% UCL OTM concentration, as calculated by ProUCL 4.0, or the maximum detected concentration if the floodplain/constituent dataset does not contain sufficient samples to conduct meaningful statistical analyses (i.e., cannot be reliably processed with ProUCL 4.0 due to having less than eight results or less than five detections).

A comparison of EPCs of constituents in floodplain groundwater to surface water criteria is presented in Table 4-4. The surface water criteria used in this evaluation are those presented in the RAWP (ARCADIS, 2008), and include both human health (Table 5-1 in the RAWP) and ecological criteria (Table 7-1 in the RAWP). Specifically, each EPC in floodplain groundwater is compared to the lower (more conservative) of the human health and ecological surface water criteria. For the reader's convenience, Tables 5-1 and 7-1 from the approved RAWP are provided in Appendix H. Those constituents that are determined to not be present in floodplain groundwater above surface water criteria are not considered to represent a potential threat to the adjacent surface water body and, thus, are not evaluated further. Those constituents that are determined to be present in floodplain groundwater above surface water criteria are evaluated further. The constituents detected in floodplain groundwater at concentrations greater than the surface water criteria, as indicated in Table 4-4, are: antimony, barium, beryllium, chloride, hexavalent chromium, cobalt, iron, mercury, selenium, silver, and vanadium.

4.2.2 Step 2: Comparison of Concentrations in Downstream Surface Water to Surface Water Criteria

Those constituents that are determined to be present in floodplain groundwater above surface water criteria in Step 1, above, are further evaluated through a comparison of downstream surface water data to surface water criteria. For this purpose, the surface water monitoring data collected for the RFI/RI Volume 2 (CH2M HILL, 2009a) and the surface water data collected by MWD (2007; 2008) are grouped into two sets: upstream and downstream. (Upstream and downstream sample location lists are provided in Table 3-5.) For those constituents without PG&E surface water data in the RFI/RI Volume 2 (CH2M HILL, 2009a), this evaluation is performed using MWD surface water data, if available.

Considering only surface water data from downstream locations, an EPC is established as either the 95% UCL OTM concentration, as calculated by ProUCL 4.0, or the maximum detected concentration if the downstream dataset does not contain sufficient samples to conduct meaningful statistical analyses (i.e., cannot be reliably processed with ProUCL 4.0 due to having less than eight results or less than five detections).

A comparison of EPCs in downstream surface water to surface water criteria is presented in Table 4-5. The surface water criteria used in this evaluation are the same as used in the preceding screening evaluation (i.e., are the lower [more conservative] of the human health and ecological surface water criteria developed and presented in the RAWP [ARCADIS, 2008]). As discussed in the RAWP, if constituents were detected in the downstream surface water at concentrations at or below surface water criteria, the groundwater-to-surface water transport pathway for those constituents was deemed to be incomplete and/or insignificant and was not evaluated further. As indicated in Table 4-5, the following constituents were determined not to be present downstream above surface water criteria and, therefore, are not further evaluated: antimony, beryllium, chloride, hexavalent chromium, cobalt, iron, mercury, selenium and silver.

Table 4-5 also shows there were two constituents that could be present in downstream surface water above surface water criteria: barium and vanadium. Accordingly, barium and vanadium are evaluated further, as discussed below in Section 4.2.3. It is important to note, however, that there are limited downstream surface water monitoring data for barium and vanadium. As indicated in Table 4-5, barium was only analyzed in nine downstream samples and was detected in six out of the nine samples (with a 95% UCL OTM of 0.14 milligrams per liter [mg/L]). Vanadium was only analyzed in six downstream samples and was detected in only three of the six samples; because vanadium was detected only three times, the maximum detected concentration of 0.253 mg/L is used as the EPC.

4.2.3 Step 3: Comparison of Downstream Data to Upstream Data

The constituents identified above in Step 2 that could be present in downstream surface water above surface water criteria (i.e., barium and vanadium) were further evaluated through a comparison of downstream

surface water data to upstream surface water data. This evaluation was performed using the Quantile Test and the Mann-Whitney or Gehan Test, similar to the population comparison tests performed in defining well-specific, and floodplain COPCs (see Section 4.1). Similar to those previous analyses, the population tests were used to test the null hypothesis that the downstream surface water data are lower than or equal to the upstream surface water data. This analysis was first performed using the upstream and downstream surface water monitoring data collected for the RFI/RI Volume 2 (CH2M HILL, 2009a). Upstream and downstream sample location lists are provided in Table 3-5.

For barium, the population comparison tests could not be performed because the upstream dataset is not sufficient for ProUCL 4.0 to produce reliable conclusions. Specifically, there are only six upstream samples (including five detections) and nine downstream samples (including six detections) of barium. However, the concentration of barium detected in the upstream and downstream samples is fairly consistent, ranging between 100 µg/L and 170 µg/L (see Table B-1a).

Similarly for vanadium, the population comparison tests could not be performed because the downstream and upstream datasets are not sufficient for ProUCL 4.0 to produce reliable conclusions. Specifically, there are only four upstream vanadium samples (including only two detections) and only six downstream vanadium samples (including only three detections). It is notable that the maximum detected vanadium concentration of 253 µg/L, from a downstream sampling location, was roughly two orders of magnitude greater than the other four detected concentrations and is the only concentration that exceeded the surface water criterion of 20 µg/L (see Table B-1a for data and Table 3-5 for upstream/downstream designations). Nonetheless, because the population comparison tests of the upstream and downstream data collected for the RFI/RI Volume 2 (CH2M HILL, 2009a) are inconclusive due to limited sample size, further evaluation was performed for both barium and vanadium using surface water data collected by the MWD.

Concentrations of barium and vanadium in surface water are further evaluated through a comparison of the downstream and upstream surface water data collected in the Colorado River by the MWD (2007; 2008). Surface water data provided by the MWD are included in Appendix C; upstream and downstream MWD surface water sampling locations are defined in Table 3-5. The MWD dataset for barium contains 30 downstream samples (including 30 detections) and 15 upstream samples (15 detections). For vanadium, the MWD dataset contains 28 downstream samples (28 detections) and 14 upstream samples (14 detections). The Quantile Test and the Mann-Whitney Test were each used to test the null hypothesis that the downstream surface water data are lower than or equal to the upstream surface water data. The results of the Quantile Test and the Mann-Whitney Test are summarized in Table 4-6; the associated ProUCL 4.0 output reports are included in Appendix F. For both barium and vanadium, the Quantile Test and the Mann-Whitney Test both support the null hypothesis that the downstream surface water data are lower than or equal to the upstream surface water data (Table 4-6).

Further, as indicated in Appendix C, the maximum detected upstream and downstream vanadium concentrations from the MWD data are 2.8 µg/L and 2.6 µg/L, respectively. Except for the one RFI/RI sample with a reported vanadium concentration of 253 µg/L, the concentrations of vanadium from the MWD data are entirely consistent with the concentrations of vanadium detected during the RFI/RI sampling, with a maximum upstream concentration of 3.1 µg/L and a maximum downstream concentration of 2.4 µg/L. The combination of the RFI/RI Volume 2 data (CH2M HILL, 2009a) and the MWD data (MWD, 2007; 2008) together provide strong support for the fact that the one elevated downstream vanadium sample reported during the RFI/RI is not representative of the rest of the sampling results, all of which are well below the surface water criteria.

In summary, it can be concluded that neither barium nor vanadium are present in downstream surface water at concentrations greater than in upstream surface water, and their presence is not likely attributable to discharges of site groundwater to the river.

4.2.4 Conclusion

The empirical data suggest that the potential transport of constituents in groundwater to the Colorado River represents an insignificant transport pathway: floodplain COPCs are not being transported to the Colorado River at concentrations that exceed screening-level surface water criteria. Accordingly, it may be concluded that quantitative surface water human health and ecological risk assessments are not warranted.

5. Exposure Assessment

To determine whether COPCs are present in groundwater at levels that may potentially pose an unacceptable risk to human health or the environment, it is necessary to identify the populations that potentially may be exposed to COPCs in groundwater and determine the pathways by which the exposures may occur. Identification of potentially exposed populations requires an evaluation of the current and potential future land uses of the site.

Once the potentially exposed human and ecological receptors are identified, the complete exposure pathways by which the individuals may contact constituents present in the groundwater must be determined. As presented in Figure 5-1, a CSM is used to show the relationship between the constituent sources, exposure pathways, and potential receptors at the site. At DTSC Human and Ecological Risk Division's (HERD's) request, the ecological risk assessment was expanded to include three additional exposure pathways in addition to the groundwater-to-surface water pathway planned in Section 7 of the RAWP (ARCADIS, 2008). These new potential pathways are evaluated in detail in Appendix I. The source-pathway-receptor relationships illustrated in the CSM (Figure 5-1) provide the basis for the quantitative exposure assessment. Only those complete source-pathway-receptor relationships are included in this GWRA.

This section presents a discussion of constituent sources and potential transport mechanisms, identifies potentially exposed populations and complete exposure pathways, discusses the human intake assumptions used in this GWRA, and summarizes the methodology for estimating representative exposure concentrations. As previously described, under current conditions, there are no users of the underlying groundwater affected by the plume. Accordingly, all discussions of direct human exposure to the groundwater are based on the hypothetical assumption that in the future a drinking water well is installed and the groundwater is used as a potable source of water.

5.1 Physical Setting

As described in Section 2, the PG&E site is located in the Mohave Valley in eastern San Bernardino County, California, near the Colorado River and the California-Arizona border. Floodplains lie on each side of the Colorado River at the site location, though they do not flood due to flow regulation provided by the Davis Dam, which is located approximately 40 miles upstream from the site. A major surface feature within the site is the BCW, an ephemeral drainage that runs south to north from the Chemehuevi Mountains to the Colorado River, approximately 3,500 feet north of the compressor station. The BCW may periodically flood during rainfall events but is typically dry due to the arid desert climate.

Groundwater occurs under unconfined to semi-confined conditions within the alluvial fan and fluvial sediments beneath most of the site. The direction of groundwater flow beneath the site is north to northeasterly. Due to the variable topography at the site, the depth to groundwater ranges from as shallow

as 5 feet bgs in floodplain wells next to the river to approximately 170 feet bgs at the upland alluvial terrace areas.

Please refer to Section 2 for a more comprehensive discussion of the physical setting.

5.2 Sources of Groundwater Contamination

The principal constituent in groundwater at the site is hexavalent chromium, which was contained in water-treatment products added to the cooling water from 1951 to 1985 to inhibit corrosion, minimize scale formation, and control biological growth. Nearly all of the hexavalent chromium present in groundwater at the site is believed to have been released during the 13-year period when untreated wastewater was discharged to the BCW. From the discharge locations in the BCW, the cooling tower blowdown water infiltrated into the coarse sand and gravel of the BCW bed and percolated approximately 75 feet downward through the unsaturated zone to reach groundwater. The depiction of the original release of the untreated wastewater and the resulting percolation and infiltration into the underlying groundwater is shown on the CSM (Figure 5-1). A detailed discussion of historical operations was presented in Section 2.4.

Although the historical releases from the BCW are known to have resulted in groundwater impacts, it is not yet clear whether any other releases, such as those identified on Figures 4-2 and 4-3 in the RAWP (ARCADIS, 2008), have impacted the groundwater (the CSMs presented in Figures 4-2 and 4-3 of the RAWP are included in Appendix J for the reader's convenience). As was described in the RAWP (ARCADIS, 2008), the characterization of soils from areas both within and outside of the compressor station is not yet complete. Additional soil characterization activities began during the fall of 2008. One of the objectives of the additional soil characterization activities, as specified in the *Draft RFI/RI Work Plan Part A* (CH2M HILL, 2006), is to verify whether there are additional sources, other than those related to the BCW, that are impacting the groundwater. The determination as to whether there are soil sources that either are or have the potential to impact groundwater via leaching will be presented in the RFI/RI Volume 3. Further, additional groundwater monitoring wells will be installed both inside the compressor station and have already been installed in the East Ravine Area, and groundwater monitoring data has been and will be collected from these wells. Accordingly, additional data collection efforts will assist in determining whether there are other sources (i.e., sources other than the historical releases to the BCW) that have impacted groundwater at the site and whether additional supplemental risk evaluations need to be conducted. A depiction of how upcoming data collection efforts may be incorporated into and complete the risk assessment process for the site is presented in Figure 1-4.

As one example, and as discussed with the agencies, additional groundwater monitoring data is being collected from the East Ravine Area. A separate screening-level risk analysis will be prepared after the East Ravine data collection is complete and will be submitted as a separate Technical Memorandum and/or addendum to this GWRA. The document will present a screening-level analysis, in which the compounds

detected in the East Ravine groundwater are identified, and the range of concentrations detected in East Ravine groundwater are discussed. A detailed quantitative risk assessment of the East Ravine groundwater data may be necessary depending on the results of the screening-level risk analysis.

For purposes of this GWRA, it is important to remember that groundwater monitoring data collected from the entire existing network of monitoring wells is being evaluated. Accordingly, to the extent that the existing extensive monitoring network is identifying constituents/sources not related to the historical releases at the BCW, this information will be quantitatively evaluated in this GWRA.

5.3 Potential Transport Mechanisms

Once constituents are in the groundwater, the potential pathways through which the constituents may move from the groundwater to other environmental media include transport and release to the surface water (Colorado River) and volatilization of VOCs from the groundwater and release into ambient/indoor air. Based on the data evaluations and identification of COPCs presented in Section 4, both of these transport mechanisms are believed to be insignificant, as summarized below.

- Groundwater-to-Surface Water Transport Pathway: Section 4.2 presents a detailed evaluation of this transport pathway, in accordance with the approach set forth in the RAWP (ARCADIS, 2008). As indicated above, the empirical data suggest that the potential transport of constituents in groundwater to the Colorado River represents an insignificant transport pathway: floodplain COPCs are not being transported to the Colorado River at concentrations that exceed screening-level surface water criteria. Accordingly, the groundwater-to-surface water transport pathway will not be evaluated any further in this GWRA.

- Volatilization of Constituents from Groundwater: As specified in the RAWP (ARCADIS, 2008), a detailed and comprehensive evaluation of the groundwater monitoring data presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b)[2] supports a conclusion that, with one or two exceptions, VOCs are not generally present in the groundwater. Based on the screening-level evaluation presented in Appendix D, the infrequent and low concentrations of VOCs that have been detected are determined to be insignificant; therefore, VOCs are not considered COPCs in this GWRA. In accordance with the RAWP (ARCADIS, 2008), as VOCs are not identified as COPCs, the volatilization pathway is not considered to be a complete/significant exposure pathway, and will not be discussed further in this GWRA.

At DTSC HERD's request, three additional potential ecological exposure pathways were evaluated:

- Shallow-rooted wetland plant exposure to chemicals in groundwater via root uptake

- Deep-rooted phreatophyte exposure to chemicals in first encountered groundwater via root uptake

- Transfer of nitrate in groundwater to plant foliage via root uptake and translocation, then potential ingestion of nitrate in plant tissue by ruminants, specifically the desert bighorn sheep (*Ovis canadensis nelsoni*).

These potential ecological exposure pathways and receptors were evaluated, and the pathways were found to be potentially complete but insignificant (Appendix I).

5.4 Potentially Exposed Populations

Under current conditions, there are no users of the underlying groundwater affected by the plume. Water for the compressor station is supplied from wells on the Arizona side of the Colorado River (i.e., Topock Wells No. 2a and No. 3). Further, Park Moabi receives water from wells that are located upgradient and outside of the hexavalent chromium plume and not at risk of being impacted by facility-related activities. In summary, the groundwater affected by the plume is not currently being used. Site groundwater is designated as having beneficial uses in the Colorado River Basin Plan (CRWQCB, 2006), however, and it is theoretically possible that site groundwater may be extracted and used as a potable water source in the future. Thus, in accordance with the RAWP (ARCADIS, 2008), the potentially exposed populations for this GWRA are "future hypothetical residential groundwater users" who may be exposed to COPCs in groundwater in a residential setting. Both child and adult future hypothetical residential groundwater users are considered in the HHRA.

To place the projected hypothetical future groundwater risks into context, it is important to remember that the only portion of the site and surrounding Study Area that have even a marginal likelihood of being developed and used for residential purposes is the USBLM land located north of the railroad (USDOI, 2007). Per USDOI direction, future land use on USFW property (overlying much of the impacted groundwater) should be considered recreational, precluding domestic use of groundwater (USDOI, 2007). Thus, calculated human health risks presented in this GWRA are truly hypothetical and are used strictly for remedial planning purposes. Future domestic use of the underlying groundwater, were it ever to occur, would most likely be limited to USBLM land located north of the railroad.

The default exposure assumptions made for the adult and child receptors are presented below in Section 5.5. As described above, because the groundwater-to-surface water transport pathways are insignificant, ecological receptors as well as human receptors potentially exposed to surface water are not further evaluated in this GWRA.

Potentially exposed ecological receptors are:

- Shallow-rooted wetland plants potentially exposed via root uptake of COPCs from groundwater

- Deeply-rooted desert plants (phreatophytes) potentially exposed via root uptake of COPCs from groundwater

- Herbivorous mammals, including ruminants, represented by the desert bighorn sheep (*Ovis canadensis nelsoni*), which may be exposed to COPCs accumulated in forage.

These pathways and receptors were evaluated at DTSC HERD's request and the pathways were found to be potentially complete but insignificant (Appendix I).

5.5 Exposure Pathways

The future hypothetical groundwater users may be exposed to COPCs in groundwater once the groundwater is extracted (via one or more water-supply wells) and used as tap water in a residential scenario. The future hypothetical groundwater users may be exposed to COPCs in tap water through direct ingestion and through dermal contact while bathing or showering. Consistent with the approach set forth in the RAWP (ARCADIS, 2008), these are the exposure pathways that will be included in the quantitative evaluation of future hypothetical risk.

As requested by USDOI, potential secondary groundwater exposure pathways to humans, such as ingestion of plants and animals exposed to contaminated groundwater, are evaluated in Appendix K. As presented in Appendix K, human exposure to contaminated groundwater is dominated by the direct exposure routes that are commonly included in groundwater risk assessments such as this GWRA: ingestion of and direct dermal exposure to contaminated groundwater. Potential secondary human exposure pathways are, therefore, not included in the quantitative evaluation of future hypothetical groundwater risk.

5.6 Exposure Point Concentrations

An exposure point is defined as a location of potential contact between an organism (e.g., human receptor) and a physical or constituent agent. The EPC is defined as the average concentration of the physical or constituent agent in the exposure medium over the period of exposure. The EPC does not represent the maximum concentration that could be contacted at any one time, but rather represents a reasonable estimate of the concentration likely to be contacted over time. Due to the uncertainty associated with estimating average exposure concentration, the EPC is typically calculated as the 95% UCL OTM concentration of the constituent in the exposure medium.

It is assumed that the quality of domestic tap water would be unchanged from that of groundwater. Thus, the EPCs to which future hypothetical groundwater users may be exposed (i.e., the average constituent concentrations in tap water over a 6-year [child resident] or 30-year [adult resident] exposure duration [ED]) are based on the concentrations of constituents measured in site groundwater.

5.7 Quantification of Potential Constituent Intakes

Exposure is defined as contact between an organism (e.g., human body) and a constituent or physical agent. In accordance with USEPA risk assessment methodology (USEPA, 1989), exposures are normalized over time and to the body weight of the receptor and are referred to as intakes. In this formulation, constituent intake is a function of: the concentration of the constituent in the exposure medium (e.g., groundwater), the contact rate between the receptor and the exposure medium, the frequency and duration of the exposure, the body weight of the receptor, and the time period over which the exposure is normalized. In this assessment, intakes are averaged over long periods of time and are referred to as chronic daily intakes (CDIs).

The generic equation for estimating the CDI of a constituent in groundwater, through ingestion or dermal contact, is as follows (USEPA, 1989):

$$CDI = \frac{C_w \times CR \times EF \times ED}{BW} \times \frac{1}{AT} \qquad (1)$$

where:

CDI = chronic daily intake (milligrams per kilogram of body weight per day [mg/kg-bw/d])

C_w = concentration of constituent in groundwater (i.e., EPC [mg/L])

CR = groundwater contact rate (liters per day [L/d])

EF = exposure frequency (days per year [d/yr])

ED = exposure duration (years [yr])

BW = body weight (kilograms [kg])

AT = averaging time (days [d]).

These intake parameters are described below. In accordance with USEPA risk assessment methodology (USEPA, 1989), values are assigned to the intake parameters such that the combination of all intake assumptions results in an estimate of the reasonable maximum exposure (RME) for that pathway. The values assigned to these intake parameters are documented in Table 5-1, with the exception of dermal permeability coefficients (PCs), which are presented in Table 5-2. In accordance with the RAWP (ARCADIS,

2008), all assumed intake parameters used in this GWRA correspond to standard default values recommended by CalEPA (CalEPA, 2005).

5.7.1 Exposure Point Concentration

As described above in Section 5.6, the EPC is a conservative estimate of the average constituent concentration in an environmental medium (USEPA, 2002b) to which a receptor may be exposed. For a given chemical, EPCs are calculated on a well-specific basis for use in the well-specific groundwater HHRA. The statistical calculation of EPCs is described above in Sections 4.1.2 (well-specific EPCs). EPCs are documented in Table 4-2.

5.7.2 Contact Rate

Contact rate describes the amount of medium contacted by the receptor per unit time or event. In accordance with the RAWP (ARCADIS, 2008), default contact rates, recommended by CalEPA, are used in this GWRA (CalEPA, 2005). For the groundwater ingestion pathway, the contact-rate parameter is ingestion rate, expressed in liters of tap water ingested per day (L/d). The child and adult future hypothetical groundwater users are assumed to ingest 1 and 2 liters of tap water per day, respectively. These ingestion rates are default values recommended by DTSC for estimation of reasonable maximum ingestion exposures for residential receptors (CalEPA, 2005). For the groundwater dermal contact pathway, the contact-rate parameters are: skin surface area (SA), expressed in square centimeters of body SA (cm^2); dermal PC, expressed in centimeters per hour; and exposure time (ET) (i.e., time spent bathing or showering per day), expressed in hours per day (hr/d). PCs are chemical-specific and receptor-independent; the PC data used in this assessment, presented in Table 5-2, are default values published by USEPA and represent the highest (i.e., most conservative) reported values from the literature surveyed (USEPA, 2004). SA and ET are receptor-specific parameters; the values assigned to these exposure parameters are default values recommended by USEPA and DTSC for estimation of reasonable maximum dermal exposures for residential receptors (USEPA, 2004; CalEPA, 2005). SA is assumed to be 6,600 cm^2 and 18,000 cm^2 for child and adult future hypothetical groundwater users, respectively. ET is assumed to be 1 hr/d and 0.58 hr/d for child and adult future hypothetical groundwater users, respectively, as recommended by CalEPA (CalEPA, 2005).

5.7.3 Exposure Frequency and Duration

Exposure frequency (EF) and ED describe the total amount of time that the receptor is assumed to be exposed to the medium or media. Consistent with USEPA and DTSC methodology, RMEs for future hypothetical groundwater users are calculated under the default assumption of a 30-year ED (USEPA, 2004; CalEPA, 2005). Specifically, the assumed ED for the adult future hypothetical groundwater user is 30 years, and the assumed ED for the child future hypothetical groundwater user is 6 years. Per CalEPA (2005)

guidance, cancer risks for future hypothetical groundwater users are calculated using an age-adjusted approach, to account for the higher per body weight exposures that occur during the childhood years. Accordingly, for carcinogenic effects, the evaluation assumes that the future hypothetical groundwater user is a child for the first 6 years of exposure and an adult for the remaining 24 years (referred to as the "age-adjusted" resident). Consistent with USEPA and CalEPA methodology, residential receptors are assumed to be at home for 350 days per year, thus the EF is assumed to be 350 d/yr for both the child and adult future hypothetical groundwater users (CalEPA, 1992).

5.7.4 Body Weight

Child and adult future hypothetical groundwater users are assumed to have a body weight of 15 and 70 kilograms, respectively. These body weights are default values recommended by USEPA and DTSC for estimation of RMEs for residential receptors (USEPA, 2004; CalEPA, 2005).

5.7.5 Averaging Times

For carcinogens, CDIs are calculated by prorating the total cumulative dose over a lifetime, in accordance with USEPA risk assessment methodology (USEPA, 1989). Thus, the averaging time for carcinogenic effects is assumed to be 25,550 days (i.e., 70 years) for the child and adult future hypothetical groundwater users. For evaluation of long-term exposure to noncarcinogens, CDIs are calculated by averaging the intakes over the period of exposure, in accordance with USEPA risk assessment methodology (USEPA, 1989); i.e., the averaging time for noncarcinogenic effects is assumed equal to the ED. Thus, the averaging time for noncarcinogenic effects is assumed to be 2,190 days (i.e., 6 years) and 10,950 days (i.e., 30 years) for the child resident and adult future hypothetical groundwater users, respectively. This parameter is not applicable to the age-adjusted future hypothetical groundwater user, as this receptor is used for evaluation of cancer health effects only.

The equations used to calculate CDIs for the groundwater ingestion and groundwater dermal contact pathways are presented in Table 5-3. As noted above, the values assigned to the intake parameters are documented in Table 5-1 with the exception of PCs, which are presented in Table 5-2 and EPCs, which are documented in Table 4-2 (well-specific EPCs).

CDIs calculated for the groundwater ingestion and groundwater dermal contact pathways for the child and adult future hypothetical groundwater users are presented in Appendix L. Well-specific carcinogenic and noncarcinogenic CDIs are presented in Tables L-1 and L-2, respectively. In conjunction with toxicity data (see Section 6), these CDIs are used to characterize the potential cancer risks and noncancer hazards associated with future hypothetical groundwater exposures, as discussed in Section 7.

6. Toxicity Assessment

Toxicity assessment characterizes the relationship between the magnitude of exposure to a constituent and the potential for adverse effects. More specifically, toxicity assessment identifies or derives toxicity values that can be used to estimate the likelihood of adverse effects occurring in humans at different exposure levels. Consistent with regulatory risk assessment policy, adverse health effects resulting from constituent exposures are evaluated in two categories: carcinogenic effects and noncarcinogenic effects. The hierarchy of sources for the toxicity criteria used for this GWRA generally corresponds to DTSC guidelines (CalEPA, 1994); all carcinogenic and noncarcinogenic toxicity values used to evaluate the potential health effects associated with exposure to COPCs in groundwater are presented in Table 6-1. In addition to these carcinogenic and noncarcinogenic toxicity assessments, the adverse health effects associated with exposure to lead are evaluated separately by comparison of lead EPCs to the California Action Level (CAL)[4] for lead in drinking water.

6.1 Toxicity Assessment for Carcinogenic Effects

Current HHRA practice for carcinogens is based on the assumption that, for most substances, there is no threshold dose below which carcinogenic effects do not occur. This no-threshold assumption for carcinogenic effects is based on an assumption that the carcinogenic processes are the same at high and low doses. This approach has generally been adopted by regulatory agencies as a conservative practice to protect public health. The no-threshold assumption is used in this GWRA for evaluating carcinogenic effects. Although the magnitude of the risk declines with decreasing exposure, the risk is estimated to be zero only at zero exposure.

The potency of a potential carcinogen is quantified by the cancer slope factor (CSF). The CSF represents the excess lifetime cancer risk due to a continuous, constant lifetime exposure to a specified level (i.e., unit dose) of a carcinogen. CSFs are generally reported as excess incremental cancer risk per milligram of constituent per kilogram body weight per day (per mg/kg-bw/day). Separate CSFs are generally reported for inhalation and oral exposures; these CSFs are referred to as the inhalation slope factor (SF_i) and the oral slope factor (SF_o), respectively. Both dermal and oral exposures are generally evaluated using the SF_o.

As specified in the RAWP (ARCADIS, 2008), the SF_o values used in this GWRA are taken directly from the following hierarchy of sources:

- CalEPA Office of Environmental Health Hazard Assessment (OEHHA) on-line *Toxicity Criteria Database* (CalEPA, 2008)

- USEPA on-line *Integrated Risk Information System* (IRIS) (USEPA, 2008a).

The CSFs used to evaluate the potential carcinogenic toxicity of COPCs in groundwater are documented in Table 6-1. Only one COPC in groundwater at the site is classified as an oral carcinogen: arsenic.

6.2 Toxicity Assessment for Noncarcinogenic Effects

The toxicity assessment for noncarcinogenic effects is based on the assumption that there exists a threshold level of exposure below which no adverse health effects occur. This threshold level varies from individual to individual. In developing a toxicity parameter for noncarcinogenic effects, the approach is to identify a threshold value that is protective of sensitive individuals in the population. For most constituents, this level can only be estimated, and the developed toxicity value incorporates uncertainty factors (UFs) indicating the degree of extrapolation used to derive the estimated value. The developed toxicity level is generally considered to have uncertainty spanning an order of magnitude or more and should not be viewed as a strict scientific demarcation between what level is toxic and nontoxic (USEPA, 1989).

The toxicity parameter that is typically used to evaluate noncarcinogenic effects is the reference dose (RfD). The RfD represents an intake level, expressed in mg/kg-bw/day, that would not be expected to cause adverse noncancer health effects in potentially exposed populations, including sensitive subpopulations (USEPA, 1989). Thus, the RfD is often referred to as the "acceptable dose." The chronic RfD specifically represents the daily exposure level that is unlikely to produce adverse noncancer health effects in potentially exposed populations, including sensitive subpopulations, over a lifetime of exposure. Analogous to CSFs, chronic RfDs are generally reported for inhalation and oral exposures (RfD_i and RfD_o, respectively). Both dermal and oral exposures are generally evaluated using the RfD_o.

The RfD_o values used in this GWRA were taken directly from the following hierarchy of sources:

- IRIS (USEPA, 2008a)
- USEPA Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites (USEPA, 2008b).

This hierarchy is consistent with the hierarchy identified in the RAWP (ARCADIS, 2008), although it should be noted that the RSLs had not been posted by USEPA Region IX at the time the RAWP was finalized. However, the hierarchy of sources relied upon by USEPA in developing the RSLs is consistent with the hierarchy of specific sources cited in the RAWP (i.e., IRIS [USEPA, 2008a], provisional peer-reviewed toxicity values derived by the USEPA Superfund Health Risk Technical Support Center, and the USEPA Superfund program's Health Effects Assessment Summary Tables [HEAST; USEPA, 1997b]).

The RfD_o values used to evaluate the potential noncarcinogenic toxicity of COPCs in groundwater are documented in Table 6-1.These are the values used in the HI estimates for all COPCs the site. For

molybdenum, supplemental evaluation of molybdenum is presented in Appendix M that describes additional information on the oral RfD for molybdenum and its relationship to dietary criteria for this essential nutrient.

6.3 Toxicity Assessment for Lead

Lead is classified as a noncarcinogen by USEPA and CalEPA. The noncarcinogenic toxicity of lead is not evaluated using the traditional RfD approach, however, because most human health effects data are based on blood-lead concentration, rather than external dose (CalEPA, 1993). Blood-lead concentration is an integrated measure of internal dose, reflecting total exposure from site-related and background sources. Instead, the level of concern with respect to lead concentrations in site groundwater is established at the CAL for lead of 0.015 mg/L)[4], as the CAL is a legally enforceable standard designed to protect public health.

7. Risk Characterization

7.1 Human Health Risk Assessment Methodology

Estimation of the potential cancer risk and noncancer hazard associated with hypothetical future exposure to COPCs in groundwater requires information regarding the constituent concentration in the exposure medium (i.e., the EPC), the assumed level of intake of the constituent (i.e., the CDI), and the carcinogenic and noncarcinogenic toxicity of the constituent (i.e., the CSF and the chronic RfD). The methodologies used to estimate the potential cancer risk and noncancer hazard associated with exposure to COPCs in groundwater are based principally on guidance provided in the regulatory documents listed below:

- USEPA. 1989. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part A). Interim Final.
- USEPA. 1991. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors." Interim Final.
- CalEPA. 1992. Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities.
- CalEPA. 1994. Preliminary Endangerment Assessment Manual. Department of Toxic Substances Control.

The equations used to estimate the potential cancer risk and noncancer hazard associated with exposure to COPCs in groundwater are presented below.

As described in the sections below, cumulative cancer risks and noncancer HIs are estimated for all COPCs identified in Section 4 of this GWRA. Cumulative cancer risks and noncancer HIs are estimated and discussed for all COPCs identified as such in this GWRA, even those constituents that the RFI/RI Volume 2 (CH2M HILL, 2009a) concluded were not related to SWMU 1/AOC 1 or SWMU 2. The final list of constituents to be carried forward to the CMS/FS, referred to as the COCs, will consist of those constituents that could potentially pose an unacceptable risk/hazard to future hypothetical groundwater users, and that may be associated with SWMU 1/AOC 1 or SWMU 2, as defined in the RFI/RI Volume 2 (CH2M HILL, 2009a).

7.1.1 Cancer Risk Methodology

For carcinogens, potential risk is estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the potential carcinogen. The CSF (see Section 6.1) converts the

estimated daily intake averaged over a lifetime of exposure directly to incremental risk of an individual developing cancer. Because relatively low intakes are likely to result from exposure to constituents at contaminated sites (compared to those experienced by laboratory test animals), it is assumed the dose-response relationship is linear. Under this assumption, the CSF is constant and risk is directly related to intake (USEPA, 1989):

$$RISK = CSF \times CDI \quad (1)$$

where:

RISK = cancer risk (i.e., the estimated probability of an individual developing cancer as a result of lifetime exposure to a particular carcinogen [unitless])

CSF = cancer slope factor (i.e., the estimated lifetime incremental cancer risk per unit dose of the carcinogen [mg/kg-bw/d])

CDI = chronic daily intake of the carcinogen (mg/kg-bw/d).

Because the CSF is often a 95% UCL of the probability of response based on experimental animal data, the resulting carcinogenic risk estimate may be considered to be an upper-bound estimate (USEPA, 1989).

The formulas used in estimating the CDIs used in the cancer risk characterization are discussed in Section 5.7 and are presented in Table 5-3. Calculated CDIs of carcinogenic COPCs in groundwater for the future hypothetical groundwater users (both child and adult) are presented in Table L-1 (well-specific CDIs) of Appendix L. The CSFs used to evaluate the potential carcinogenicity of COPCs in groundwater are documented in Table 6-1.

Consistent with USEPA risk assessment guidance, cancer risks posed by exposure to multiple carcinogens are considered to be additive or “cumulative.” Thus, the total excess lifetime risk of cancer posed by the presence of multiple carcinogenic constituents in groundwater is assumed to be the sum of the risk posed by each individual carcinogenic chemical:

$$\text{TOTAL RISK} = \sum \text{RISK} \qquad (2)$$

where:

TOTAL RISK = total cancer risk (i.e., the estimated probability of an individual developing cancer as a result of lifetime exposure to multiple carcinogens [unitless])

RISK = cancer risk (i.e., the probability of an individual developing cancer as a result of lifetime exposure to a particular carcinogen [unitless]).

For risk management purposes, a total cancer risk of one in a million probability of occurrence (1×10^{-6}) is a point of departure below which cancer risks are considered to be insignificant (40 CFR Part 300). Cancer risks between one in a million and one hundred in a million probability of occurrence (1×10^{-6} and 1×10^{-4}) fall within a risk management range. This is generally referred to as the acceptable risk range. Within this estimated cancer risk range, there is flexibility for risk managers in deciding what action, if any, is necessary and appropriate for the protection of human health. Cancer risks above 1×10^{-4} are generally considered to be unacceptable.

7.1.2 Noncancer Hazard Methodology

The RfD approach (see Section 6.2) is based on the theory that there exists a threshold level of exposure below which it is unlikely for even sensitive subpopulations to experience adverse noncancer health effects. If the estimated exposure level (i.e., the CDI) exceeds this threshold value (i.e., the chronic RfD), there may be concern for potential noncancer health effects. Generally, the larger ratio of CDI to chronic RfD, the greater the potential level of concern. This ratio is not to be interpreted as a probability of developing noncancer health effects, however, and the level of concern does not increase linearly with this ratio USEPA (1989).

The ratio of the CDI of a constituent to the chronic RfD for that constituent is referred to as the noncancer hazard quotient (HQ):

$$\text{HQ} = \frac{\text{CDI}}{\text{RfD}} \qquad (3)$$

where:

HQ = noncancer hazard quotient (i.e., a measure of the potential [not probability] for an individual to develop adverse noncancer health effects as a result of exposure to a particular constituent [unitless])

CDI = chronic daily intake of the constituent (mg/kg-bw/d)

RfD = chronic reference dose (i.e., the threshold level of exposure that would not be expected to cause adverse noncancer health effects in potentially exposed populations, including sensitive subpopulations [unitless]).

The formulas used in estimating the CDIs for noncancer hazard characterization are discussed in Section 5.7 and are presented in Table 5-3. Calculated CDIs of COPCs in groundwater for the future hypothetical groundwater users (child and adult residents) are presented in Table L-2 (well-specific CDIs). The chronic RfDs used to evaluate the potential noncarcinogenic toxicity of COPCs in groundwater are documented in Table 6-1.

Noncancer hazards posed by exposure to multiple noncarcinogenic constituents with similar health effects are considered to be cumulative. Thus, the total excess noncancer hazard posed by the presence of several noncarcinogenic constituents in groundwater is the sum of the hazards posed by each individual noncarcinogenic chemical. The cumulative noncancer hazard is referred to as the hazard index (HI):

$$HI = \sum HQ \qquad (4)$$

where:

HI = noncancer hazard index (i.e., an index of the cumulative potential [not probability] for an individual to develop adverse noncancer health effects as a result of exposure to multiple constituents [unitless])

HQ = noncancer hazard quotient (i.e., a measure of the potential [not probability] for an individual to develop adverse noncancer health effects as a result of exposure to a particular constituent [unitless]).

It should be noted that in this GWRA the HQ terms are conservatively summed for all constituents independent of the target organ that is affected by the chemical. This is conservative, as constituents that impact different target organs (e.g., liver and kidney) are not truly additive in their potential to cause the adverse impact. Appendix N presents a table that identifies the target organs for hexavalent chromium, molybdenum, selenium, and nitrate as nitrogen. As indicated in Appendix N, the target organs impacted by hexavalent chromium, molybdenum, and selenium are different; therefore, consistent with USEPA Risk Assessment Guidance (USEPA, 1989), the noncancer HQs estimated for hexavalent chromium, molybdenum, and selenium would not need to be summed. We note that nitrate as nitrogen and hexavalent chromium, at specified doses, could both impact the blood system and thus should conservatively be evaluated by summing the HQs for each individual compound (i.e., summing of the HQ for nitrate and

hexavalent chromium). For noncancer health hazards, an HI of unity (1.0) is identified as the target level of concern; constituent exposures that yield HIs of less than or equal to 1.0 are not expected to result in adverse noncancer health effects, even in susceptible populations (USEPA, 1989).

7.2 Overview of Human Health Risk Assessment Results

In accordance with the RAWP (ARCADIS, 2008), hypothetical cancer risks and noncancer hazards are estimated at each individual site groundwater well. COPCs and estimated EPCs of COPCs vary from well-to-well; all other input assumptions to this GWRA are non-site-specific default values, and are consistent across all wells, including receptors, exposure pathways, groundwater contact rates, EF and ED, body weight, averaging times, and carcinogenic and noncarcinogenic toxicity values. These inputs have been described above and are briefly discussed below in the context of the well-specific HHRA.

7.2.1 Calculation Input

The selection of well-specific groundwater COPCs and the calculation of EPCs are discussed in detail in Section 4.1.2. For each site groundwater well, those constituents that are determined to be groundwater COPCs for the well-specific HHRA are listed in Table 4-2 with their associated estimated EPCs.

The exposure assumptions for the well-specific HHRA are discussed in detail in Section 5. The potentially exposed population consists of “future hypothetical groundwater users” (Figure 5-1). The specific receptors evaluated in this GWRA are an onsite child resident and an onsite adult resident contacting groundwater through direct ingestion and dermal contact while bathing or showering. Exposure assumptions regarding groundwater contact rate, EF and ED, body weight, and averaging times are provided in Table 5-1 for each of the receptors and correspond to standard default assumptions recommended by CalEPA (2005). PCs used to estimate CDIs for the dermal contact pathway are provided in Table 5-3. CDIs for the ingestion and dermal contact exposure pathways are calculated using the equations presented in Table 5-3. Well-specific CDIs of carcinogenic and noncarcinogenic groundwater COPCs are presented in Tables L-1 and L-2, respectively, of Appendix L.

The carcinogenic and noncarcinogenic toxicity data used to evaluate the potential health effects associated with exposures to groundwater COPCs are discussed in detail in Section 6. The CSFs and noncancer chronic RfDs used in the well-specific HHRA are documented in Table 6-1.

7.2.2 Well-Specific Results

7.2.2.1 Cancer Risk Estimates

The estimated potential cancer risks to hypothetical future groundwater users, associated with exposures to well-specific groundwater, are summarized in Table 7-1 and presented in detail in Table O-1 of Appendix O. Only one carcinogenic constituent is present in site groundwater wells, arsenic, and all estimated potential cancer risks are attributable to this constituent. Arsenic has been detected above background in only three of the 110 groundwater wells for which arsenic was sampled: MW-12, MW-24A, and MW-43-25, with representative EPCs of 0.11 mg/L, 0.034 mg/L, and 0.024 mg/L, respectively. For the hypothetical future groundwater user, the estimated well-specific potential cancer risks range from 3.4×10^{-3} to 1.5×10^{-2} across these three wells; the maximum estimated potential cancer risk of 1.5×10^{-2} occurs at well MW-12, located south of Interstate 40 on Federal property leased by CalTrans. Estimated well-specific potential cancer risks are depicted in Figure 7-1. A more detailed discussion of the arsenic risks is presented below in Section 7.3. It should be noted, however, that the background risk level for arsenic is also greater than the upper end of the risk management range at 3.4×10^{-3}. The estimated potential cancer risks are dominated by the ingestion pathway, which accounts for approximately 99.6% of the total risk while the dermal contact pathway accounts for only approximately 0.4% of the total risk (see Table O-1 for risk breakdown by pathway). Estimated potential cancer risks associated with the dermal contact pathway for arsenic are on the order of 1×10^{-5} to 1×10^{-4}. It should also be noted that these estimated risks are purely hypothetical, estimated under the assumption that in the future someone drills a well onsite and relies on the groundwater as their sole source of water for an entire 30-year period. As there are no current uses of the impacted groundwater, the constituents present in the groundwater pose no current risk to any current populations. Further, as previously discussed, it is highly unlikely that residential use would occur in the future on any portion of the site. The only portion of the site that has even a marginal likelihood of being developed and used for residential purposes in the future is the USBLM land, located north of the railroad (USDOI, 2007). Future domestic use of the underlying groundwater, were it to ever occur, would most likely be limited to USBLM land located north of the railroad and, therefore, estimated risks for wells that are located anywhere outside the USBLM land represent estimated risks that do not correlate with potential future health risks.

7.2.2.2 Noncancer Hazards

The estimated potential noncancer hazards to hypothetical future groundwater users, associated with exposures to well-specific groundwater, are summarized in Tables 7-2 and 7-3 for the child and adult future hypothetical groundwater users, respectively, and presented in detail in Table O-2. Discussion and analysis of estimated HIs focuses on the most sensitive receptor, the child future hypothetical groundwater user. Estimated well-specific HIs for the child future hypothetical groundwater user range from 0.0076 to 340 across the 110 groundwater wells with at least one constituent detected above background levels; the threshold HI of 1.0 is exceeded in 87 of these 110 wells. Estimated well-specific HIs for the child hypothetical

future groundwater water user are depicted in Figure 7-2. As indicated in Table 7-2, estimated noncancer hazard is driven largely by hexavalent chromium, although other constituents also contribute to the estimated noncancer hazard at a very few wells. The estimated noncancer hazard associated with exposures to hexavalent chromium exceeds the threshold HI of 1.0 for this constituent alone at 62 wells. Other constituents that exceed the threshold HI of 1.0 on an individual-constituent basis in one or more wells are the following:

- Molybdenum (six wells)
- Vanadium (seven wells)
- Antimony (seven wells)
- Fluoride (five wells)
- Nitrate as nitrogen (one well)
- Arsenic (three wells)
- Barium (two wells)
- Cobalt (two wells)
- Thallium (two wells)
- Cadmium (one well)
- Selenium (one well)
- Silver (one well).

The estimated potential noncancer hazards associated with these constituents are discussed in detail in Section 7.3. It should be noted that these estimated noncancer hazards are purely hypothetical, estimated under the assumption that in the future someone drills a well onsite and relies on the groundwater as their sole source of water for an entire 30-year period. As there are no current uses of the groundwater, the constituents present in the groundwater pose no current noncancer hazard to any current populations. Further, as previously discussed, it is highly unlikely that residential use would occur in the future on any portion of the site. The only portion of the site that has even a marginal likelihood of being developed and

used for residential purposes in the future is the USBLM land, located north of the railroad (USDOI, 2007). Future domestic use of the underlying groundwater, were it to ever occur, would most likely be limited to USBLM land located north of the railroad and, therefore, estimated noncancer hazards for wells that are located anywhere outside the USBLM land represent estimated hazards that do not correlate with potential future health threats.

Presented in Table 7-4 is a breakdown, by chemical, of the percent contribution to cumulative noncancer hazard at each well. Figure 7-3 presents the percent contribution, by chemical, to cumulative noncancer hazard at each well where the total cumulative HI is greater than 1.0. The constituent that is most frequently the largest contributor to cumulative noncancer hazard is hexavalent chromium. As indicated in Figure 7-3, hexavalent chromium is the largest contributor to cumulative hazard at nearly all of the wells within the defined hexavalent chromium plume.

7.2.2.3 Lead

As described in Section 6.3, the noncarcinogenic toxicity of lead is not evaluated using the traditional RfD approach, because most human health effects data are based on blood-lead concentration, rather than external dose (CalEPA, 1993). Rather, EPCs of lead in groundwater are compared directly to the CAL for lead of 0.015 mg/L. As shown in Table 7-5, the well-specific lead EPC is estimated to exceed the CAL in seven of the 36 groundwater wells where lead was detected above the background UTL (frequency of 19%). The highest estimated lead EPC of 0.076 mg/L occurs at MW-22, in the floodplain south of Interstate 40, and is 5.1 times greater than the CAL. The other six wells where the estimated lead EPC exceeds the lead CAL are: MW-30-30 (4.9 times greater), MW-20-130 (2.8 times greater), MW-23 (1.8 times greater), MW-27-20 (1.6 times greater), MW-31-60 (1.4 times greater), and MW-20-100 (1.1 times greater). As shown in Figure 7-4, the well-specific lead EPC is estimated to exceed the CAL at locations within and outside of the hexavalent chromium plume, but all wells with estimated lead EPCs exceeding the CAL are located far from the discharge area in the floodplain east of National Trails Highway (also known as Route 66 and Park Moabi Road) (CH2M HILL, 2009a). Lead was not identified as potentially related to releases from SWMU 1/AOC 1 or SWMU 2 (CH2M HILL, 2009a; CH2M HILL, 2009b). A more detailed discussion of the significance of lead detected in groundwater is presented in Section 7.3.

7.3 Discussion of Results

This section expands upon the results of the estimated well-specific groundwater cancer risks and noncancer hazards presented above, to provide perspective on the significance of constituents detected in groundwater and whether specific constituents may need to be incorporated into the CMS/FS. The basic criteria or questions that guide this discussion are summarized below.

- How often was the individual constituent detected in site groundwater above target risk/noncancer hazard thresholds, or at a level where the contribution of the constituent to a cumulative exceedance of the target risk or noncancer hazard is material? In other words, how often (in what percentage of wells) is the constituent considered to be a risk driver, either individually or cumulatively with other constituents? Within each well, how many samples are above target HI thresholds? Are the wells geographically distinct? Are the wells located in the limited portion of the Study Area that could potentially, someday, be used for residential purposes (i.e., the USBLM land located north of the railroad)? Note that the specific methodology used in making the determination of material contribution to elevated cumulative hazard is described in Appendix P.

- What is the magnitude of the detections of this chemical? In other words, independent of the frequency with which the constituent is a material contributor to elevated estimated cumulative risk or hazard, either individually or cumulatively with other constituents, how large is the contribution from the chemical, typically, to estimated cumulative risk or hazard?

- The frequency and magnitude at which the constituent is a risk driver (two preceding items) are further evaluated in the context of a parallel "sensitivity analysis" risk assessment that bases EPCs on average, rather than maximum, concentrations at those wells with too few results (fewer than eight results or fewer than five detections) to calculate a meaningful 95% UCL OTM. The results of the sensitivity analysis risk assessment are presented in full in Appendix G and are discussed below in the context of specific constituents.

- How often was the constituent detected in site groundwater? How often was the constituent detected in site groundwater above background levels?

To guide and focus this discussion, the constituents included in the well-specific groundwater HHRA are separated into five categories, based on (1) the frequency with which a constituent is calculated to be a material contributor (either individually or cumulatively with other constituents) to elevated estimated cumulative risk or hazard, and (2) the magnitude of contribution to elevated estimated cumulative risk or hazard. To categorize the constituents in this manner, the risks and noncancer hazards estimated at each well are examined individually to identify the risk drivers for that well. The quantitative process used to rank the frequency and magnitude of contribution to estimated cumulative risk or hazard from each constituent at each individual well is described in Appendix P and is summarized in Table 7-6. The resulting categorization of constituents based on the well-specific risk evaluation is presented in the following table. Please refer to Tables 7-1 through 7-3 for the detailed presentation of risk and hazard for each constituent at each well. A detailed discussion of estimated risks and hazards for each constituent is described below in Sections 7.3.1 through 7.3.5.

Categorization of Constituents According to Frequency and Magnitude of Contribution to Elevated Estimated Cumulative Noncancer Hazard Index At Individual Wells[1,2]

Cat.	Frequency of Contribution[3]	Magnitude of Contribution[4]	Chemicals in Category	Level of Potential Hazard/Risk
1	Zero	Not applicable	Aluminum, beryllium, copper, mercury, and zinc	None
2	Low	Low	Barium, cadmium, cobalt, nickel, nitrate as nitrogen, selenium, silver, and thallium	Low
3a	Low	Moderate	Fluoride	Low to moderate
3b	Moderate	Low	Lead, molybdenum, and vanadium	
4a	Moderate	Moderate	Antimony	Moderate
4b	Low	High	Arsenic	
5	Moderate	High	Hexavalent chromium	Moderate to high

Notes:

(1) Lead frequency and magnitude of contribution are based on a comparison to the CAL for lead.

(2) Arsenic magnitude of contribution is based on estimated cancer risk. Arsenic is the only oral carcinogenic chemical.

(3) The frequency of contribution is based on the percent of wells in which a constituent is determined to be a material contributor to elevated noncancer hazard. In this section, constituents are grouped into zero (0 percent), low (0 to 5 percent), moderate (5 to 50 percent), and high (greater than 50 percent) frequency of contribution.

(4) The magnitude of contribution is based on the average estimated noncancer hazard index (HI) at the wells in which a constituent is determined to be a material contributor to elevated noncancer hazard. In this section, constituents are grouped into low (average HI between 0.5 and 5), moderate (average HI between 5 and 50), and high (average HI greater than 50) magnitude of contribution.

As discussed in Sections 3 and 4, the EPC of a constituent in groundwater is assumed equal to the maximum detected concentration in those situations where the constituent dataset contains fewer than eight values or fewer than five detects. This is a conservative assumption in many cases (e.g., many samples but few detects), as the estimated EPC is not intended to represent the maximum concentration that could be contacted at any one time, but rather provide a reasonable estimate of the concentration likely to be contacted over time.

The following table summarizes the number of constituents and wells for which the projected estimates of cancer and noncancer hazard are based on a maximum detected concentration. As indicated below, estimated risk and noncancer hazards at individual wells are based on the use of maximum concentrations

at more than 50% of the wells for the following 14 constituents: aluminum, antimony, arsenic, barium, beryllium, cadmium, cobalt, fluoride, lead, mercury, selenium, silver, thallium, and vanadium.

Reliance on Maximum Concentrations

COPC	Total Number of Wells	Wells with EPC Based on Maximum	Percentage
Aluminum	16	16	100%
Antimony	8	7	88%
Arsenic	3	2	67%
Barium	10	8	80%
Beryllium	14	14	100%
Cadmium	1	1	100%
Chromium, hexavalent	69	10	14%
Cobalt	8	6	75%
Copper	40	14	35%
Fluoride	5	4	80%
Lead	36	35	97%
Mercury	1	1	100%
Molybdenum	38	15	39%
Nickel	38	9	24%
Nitrate as nitrogen	52	25	48%
Selenium	17	11	65%
Silver	7	6	86%
Thallium	2	2	100%
Vanadium	19	11	58%
Zinc	37	9	24%

In order to understand the implications of using maximum detected concentrations as EPCs, a sensitivity analysis is presented in Appendix G that uses the arithmetic average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. For the purpose of calculating these average concentrations, non-detect results are assumed equal to one-half the laboratory detection limit. The results of the sensitivity analysis are presented in Appendix G and are discussed below in the context of specific constituents. The sensitivity analysis will provide the risk managers with an understanding of the sensitivity of relying upon maximum concentrations to the overall characterization of

hypothetical future risks and hazards estimated for each well. As discussed with the agencies, the sensitivity analysis provides important information as it allows risk managers to better understand whether estimated risks/hazards are based on limited or robust quantities of data. Although informative to the risk managers, the sensitivity analysis is not used to eliminate COPCs from the GWRA or to reach conclusions as to whether a particular chemical is a COC that should be carried forward to the CMS/FS.

A detailed discussion of risks and hazards estimated for each constituent is described below in Sections 7.3.1 through 7.3.5.

7.3.1 No Potential Risk/Hazard

The constituents in this category were consistently detected below target risk thresholds and below levels where the cumulative impact associated with the presence of the constituent with others could potentially alter the overall conclusion of projected risk/hazard at that location. In other words, these constituents are below risk thresholds individually, do not contribute materially to cumulative noncancer hazards above the target threshold[10,11] at any location, and accordingly are not a risk/hazard to hypothetical future groundwater users at the site. The constituents in this category are aluminum, beryllium, copper, mercury, and zinc.

7.3.2 Low Potential Risk/Hazard

The constituents in this category contribute materially to exceedances of the cumulative noncancer hazard threshold with low frequency – at less than 5% of the individual groundwater wells. At those few wells where these constituents do contribute materially to an exceedance of the cumulative estimated noncancer hazard threshold, the average (individual-chemical) estimated HI for that list of wells (see Table 7-6) is low – on the order of 0.5 to 5. Thus, these constituents may be considered to be a low risk/hazard to hypothetical future groundwater users at the site. The constituents in this category are barium, cadmium, cobalt, nickel, nitrate as nitrogen, selenium, silver, and thallium. Each of these constituents is discussed further below.

[10] As arsenic is the only chemical evaluated as a carcinogen in this risk assessment, discussions relating to cumulative risks and contribution to cumulative risk are focused on noncancer hazards only. That is, the conclusions related to cancer risks result only from arsenic and, therefore, are not impacted by the presence of any other chemicals.

[11] Target noncancer hazard threshold is defined as an HI of 1.0.

7.3.2.1 Barium

As indicated in Table 7-6, barium is a material contributor to elevated estimated noncancer hazard[12] at two (1.9%) of 107 groundwater wells where it was sampled and analyzed for. At these two particular wells, the average estimated HI attributable to barium is 1.7. As described in Appendix P, these two wells are geographically distant from each other. Furthermore, barium was detected at concentrations in excess of the target noncancer hazard threshold in only one sample in each of these wells, and in no other samples over the site. Therefore, it may be concluded that both the frequency and magnitude of the contribution of barium to elevated estimated cumulative noncancer hazard are low.

A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. As summarized in Table 7-6, the results of this sensitivity analysis indicate that barium would be a material contributor to an elevated estimated noncancer hazard at only one (0.9%) of 107 groundwater wells, with an estimated HI of 1.7, if barium EPCs were based on average rather than maximum concentrations. This further supports the conclusion that barium has been infrequently detected at the site at levels in excess of the target noncancer threshold.

As indicated in Table 7-6, barium was detected on a site-wide basis in 361 (65%) of 559 samples analyzed for barium and was detected above background levels in 10 (9.3%) of the 107 wells sampled for barium, which supports that barium was detected with low frequency at levels in excess of background concentrations.

Based on these analyses, it may be concluded that barium is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water.

7.3.2.2 Cadmium

As indicated in Table 7-6, cadmium is a material contributor to elevated estimated noncancer hazard at one (1.5%) of 68 groundwater wells where it was sampled and analyzed for. At this particular well, the estimated HI attributable to cadmium is 1.4. Moreover, as detailed in Appendix P, cadmium was detected in only one of 14 samples at this one well, and nowhere else over the entire site. Therefore, it may be concluded that both the frequency and magnitude of the contribution of cadmium to elevated estimated cumulative noncancer hazard are low.

[12] In this section, elevated noncancer hazard refers to HIs that exceed the threshold of 1.0.

The well-specific analysis takes the conservative approach of using the single detected concentration as the estimated EPC. A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those cadmium datasets with fewer than eight values or fewer than five detects. As summarized in Table 7-6, the results of this sensitivity analysis indicate that cadmium would not be a material contributor to elevated estimated noncancer hazard at any groundwater well if cadmium EPCs were based on average rather than maximum concentrations. The results of this sensitivity analysis support the conclusion that this constituent has been detected at low frequency at the site at levels in excess of the target noncancer threshold.

As indicated in Table 7-6, cadmium was detected on a site-wide basis in one (0.27%) of 374 samples analyzed for cadmium and was detected above background levels in one (1.5%) of the 68 wells sampled for cadmium, which supports that cadmium was detected with low frequency at levels in excess of both background concentrations and analytical detection limits.

Based on these analyses, it may be concluded that cadmium is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water.

7.3.2.3 Cobalt

As indicated in Table 7-6, cobalt is a material contributor to elevated estimated noncancer hazard at two (2.9%) of 68 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to cobalt is 1.6. As described in Appendix P, these two wells are geographically distinct from each other. Furthermore, cobalt was detected in only one sample in each of these two wells. One well was sampled three times and the other was sampled 14 times. Therefore, it may be concluded that both the frequency and magnitude of the contribution of cobalt to elevated estimated cumulative noncancer hazard are low.

Given the low frequency of detection, EPCs for cobalt are conservatively based on maximum concentrations. A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations. As summarized in Table 7-6, the results of this sensitivity analysis indicate that cobalt would be a material contributor to elevated estimated noncancer hazard at two (2.9%) of 68 groundwater wells, with an average estimated HI of 0.62 if cobalt EPCs were based on average rather than maximum concentrations. The magnitude of contribution of cobalt to elevated estimated cumulative noncancer hazard is 62% lower when using average values and further supports the conclusion that this constituent has been infrequently detected at the site at levels in excess of the target noncancer threshold.

As indicated in Table 7-6, cobalt was detected on a site-wide basis in 13 (3.5%) of 374 samples analyzed for cobalt and was detected above background levels in eight (12%) of the 68 wells sampled for cobalt, which

supports that cobalt was detected with low frequency at levels in excess of both background concentrations and analytical detection limits.

Based on these analyses, it may be concluded that cobalt is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water.

7.3.2.4 Nickel

As indicated in Table 7-6, nickel is a material contributor to elevated estimated noncancer hazards at two (2.3%) of 86 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to nickel is 0.66. As described in Appendix P, the estimated HIs attributable to nickel at these wells are 0.48 and 0.84. Therefore, it may be concluded that both the frequency and magnitude of the contribution of nickel to elevated estimated cumulative noncancer hazard are low.

A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. Nickel EPCs all are based on 95% UCLs. Therefore, nickel results do not change with respect to the sensitivity analysis as summarized in Table 7-6.

As indicated in Table 7-6, nickel was detected on a site-wide basis in 479 (46%) of 1,049 samples analyzed for nickel and was detected above background levels in 38 (44%) of the 86 wells sampled for nickel, which supports that nickel was detected with moderate frequency at levels in excess of background concentrations.

Based on these analyses, it may be concluded that nickel is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water.

7.3.2.5 Nitrate as Nitrogen

As indicated in Table 7-6, nitrate as nitrogen is a material contributor to elevated estimated noncancer hazard at eight (4.8%) of 165 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to nitrate as nitrogen is 0.84 (slightly below the target HI of 1.0). Further, as discussed in Appendix R, when looking only at the four constituents that are potentially associated with releases from SWMU 1/AOC 1 (i.e., hexavalent chromium, nitrate as nitrogen, selenium, and molybdenum), nitrate as nitrogen is a material contributor to elevated estimated noncancer hazard at five wells: specifically MW-9 (with a nitrate HI of 0.91), MW-24A (with a nitrate HI of 0.74); MW-40D (with a nitrate HI of 0.79), MW-51 (with a nitrate HI of 0.57) and PT-8M (with a nitrate HI of 1.3). Each of these five wells is located south of I-40, on land where residential use is not considered a reasonable future land use. As indicated, the estimated HIs for nitrate as nitrogen exceed the threshold of 1.0 in only one well, with an HI

of 1.3. Therefore, it may be concluded that the frequency of contribution of nitrate as nitrogen to elevated estimated cumulative noncancer hazard is low, and the magnitude of the contribution is low. The magnitude of the estimated noncancer HIs attributable to nitrate as nitrogen at individual wells are depicted in Figure 7-5. As indicated, the one well where nitrate as nitrogen exceeds an HI of 1.0, PT-8M, is located just north of the compressor station, on land where residential land use is not considered a reasonable future land use.

A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. As summarized in Table 7-6, the results of this sensitivity analysis indicate that nitrate as nitrogen would be a material contributor to elevated estimated noncancer hazard at only three (1.8%) of 165 groundwater wells, with an average estimated HI of 0.77. As with the baseline analysis, if nitrate as nitrogen EPCs were based on average rather than maximum concentrations, only one well slightly exceeds the threshold noncancer HI of 1.0.

As indicated in Table 7-6, nitrate as nitrogen was detected on a site-wide basis in 573 (68%) of 844 samples analyzed for nitrate as nitrogen and was detected above background levels in 52 (32%) of the 165 wells sampled for nitrate as nitrogen, which supports that nitrate as nitrogen was detected with moderate frequency at levels in excess of background concentrations.

Based on the baseline analyses, it may be concluded that nitrate as nitrogen is present in site groundwater at only one location at a slightly elevated level relative to the threshold HI of 1.0. Further, nitrate as nitrogen is present at only four wells where, although less than an HI of 1.0[13], and insignificant relative to the noncancer hazards associated with hexavalent chromium, it contributes materially to an elevated noncancer hazard when evaluated in combination with the four COPCs associated with releases from SWMU 1/AOC 1 (see Appendix R). Thus, based on the low number of wells where nitrate as nitrogen contributes to elevated noncancer hazard, and the low magnitude of the HI, it may be concluded that nitrate as nitrogen is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water.

[13] As indicated in Appendix R, there are only five out of 165 groundwater wells where nitrate contributes materially to an elevated HI: MW-9 (with a nitrate HI of 0.9 and a hexavalent chromium HI of 7.5), MW-24A (with a nitrate HI of 0.74 and a hexavalent chromium HI of 73); MW-40D (with a nitrate HI of 0.79 and a hexavalent chromium HI of 1.8); MW-51 (with a nitrate HI of 0.57 and a hexavalent chromium HI of 100), and PT-8M (with a nitrate HI of 1.3 and a hexavalent chromium HI of 85). Each of these five wells is located south of I-40, on land where residential use is not considered a reasonable future land use. The total noncancer HI at each of these five wells is dominated by hexavalent chromium.

7.3.2.6 Selenium

As indicated in Table 7-6, selenium is a material contributor to elevated estimated noncancer hazard at two (2.6%) of 76 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to selenium is 1.3. As described in Appendix P, the selenium-specific HI exceeds the threshold of 1.0 in only one well across the entire site[14]. The magnitude of the estimated potential noncancer HIs attributable to selenium at individual wells are depicted in Figure 7-6. The one well where the selenium HI exceeds the threshold of 1.0 is TW-1, with an HI of 2.0 estimated for selenium at this location. TW-1 is located within the compressor station, where residential land use is not considered a reasonable future land use. In sum, it may be concluded that both the frequency and magnitude of the contribution of selenium to elevated estimated cumulative noncancer hazard are low.

A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. As summarized in Table 7-6, the results of this sensitivity analysis indicate that selenium would be a material contributor to elevated estimated noncancer hazard at one (1.3%) of 76 groundwater wells, with an estimated HI of 1.4, if selenium EPCs were based on average rather than maximum concentrations. This further supports the conclusion that this constituent has been detected at low frequency at the site at levels in excess of the target noncancer threshold.

As indicated in Table 7-6, selenium was detected on a site-wide basis in 168 (42%) of 396 samples analyzed for selenium and was detected above background levels in 17 (22%) of the 76 wells sampled for selenium, which supports that selenium has been detected at low frequency at levels in excess of background concentrations.

Because selenium is an essential nutrient and potentially associated with releases from SWMU 1/AOC 1 (CH2M HILL, 2009a), an additional evaluation of potential exposure is presented in Appendix M and summarized in Section 7.4. This evaluation complies with USEPA metals risk assessment guidance (USEPA, 2007b). The purpose of this additional evaluation is to more fully explore the uncertainties associated with the estimated noncancer hazards calculated for selenium and provide the risk managers with a more in-depth evaluation of the weight of the evidence with respect to the presence and potential

[14] As the target organ impacted by selenium is different than the target organ(s) impacted by molybdenum, nitrate as nitrogen, and hexavalent chromium (i.e., the four compounds that are potentially associated with releases from SWMU 1/AOC 1 [as discussed in upcoming sections]), it is arguably overly conservative to assess the significance of selenium by using an HI that is based on the sum of these four chemical-specific HIs. Rather, a more reasonable estimate of the potential for noncancer hazards associated with the presence of selenium can be obtained by examining the selenium-specific HIs. Please refer to Appendix N.

future health hazards associated with the selenium. As described in further detail in Section 7.4 and Appendix M, the essential nutrient evaluation for selenium results in conclusions that are consistent with the findings of the traditional risk evaluation.

Based on these analyses (including essential nutrient considerations), it may be concluded that selenium is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water.

7.3.2.7 Silver

As indicated in Table 7-6, silver is a material contributor to elevated estimated noncancer hazard at three (4.4%) of 68 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to silver is 0.92. Moreover, within each of these wells, silver was infrequently detected above the detection limit. As described in Appendix P, silver was detected at the three wells where silver contributes materially to elevated estimated noncancer hazard in only: (a) one of 14, (b) one of 14, and (c) two of four samples. Further, the silver-specific HI exceeds a threshold of 1.0 in only one well across the site (well TW-1, with an HI of 1.1). Therefore, it may be concluded that both the frequency and magnitude of the contribution of silver to elevated estimated cumulative noncancer hazards are low.

A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. As summarized in Table 7-6, the results of this sensitivity analysis indicate that silver would not be a material contributor to elevated estimated noncancer hazards at any groundwater well if silver EPCs were based on average rather than maximum concentrations. The result of this sensitivity analysis supports the conclusion that this constituent has been detected at low frequency at the site at levels in excess of the target noncancer threshold.

As indicated in Table 7-6, silver was detected on a site-wide basis in eight (2.1%) of 374 samples analyzed for silver and was detected above background levels in seven (10%) of the 68 wells sampled for silver, which supports that silver has been detected at low frequency at levels in excess of both background concentrations and analytical detection limits.

Based on these analyses, it may be concluded that silver is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water.

7.3.2.8 Thallium

As indicated in Table 7-6, thallium is a material contributor to elevated estimated noncancer hazard at two (2.9%) of 68 groundwater wells where it was sampled and analyzed for. At these particular wells, the

average estimated HI attributable to thallium is 1.1. As described in Appendix P, the two wells are geographically distant from one another, with one well located on the far west side of the site in the IM groundwater injection area. Moreover, at each of these wells, thallium was infrequently detected (as described in Appendix P, thallium was detected in only one of 17 samples and one of seven samples, at the two wells where thallium contributes materially to elevated noncancer hazard. Therefore, it may be concluded that both the frequency and magnitude of the contribution of thallium to elevated estimated cumulative noncancer hazards are low.

A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. The results of this sensitivity analysis provide no additional information for this constituent because a number of the samples contain elevated detection limits (up to an order of magnitude greater than the actual detected value), which results in mean concentrations that are likely biased high.

As indicated in Table 7-6, thallium was detected on a site-wide basis in two (0.53%) of 374 samples analyzed for thallium and was detected above background levels in two (2.9%) of the 68 wells sampled for thallium, which supports that thallium has been detected at low frequency at levels in excess of both background concentrations and analytical detection limits. The fact that thallium was detected above the laboratory reporting limit in only two samples from the entire site suggests that the presence of thallium, both across the site and at individual wells, is sporadic and inconsistent. One detection was in a well inside the hexavalent chromium plume (MW-12) and the other was outside the hexavalent chromium plume (CW-3D). Further, as thallium was only detected in one sample from each of the two wells where it was detected (i.e., detected in 1 out of 17 samples from MW-12; detected in 1 out of 7 samples from CW-3D), the EPCs used in the well-specific HHRA are maximum detected concentrations; this is highly conservative for a compound that has been detected in only 0.53% of all groundwater samples.

Based on these factors and analyses, it may be concluded that thallium is unlikely to pose adverse health effects to hypothetical future groundwater users at the site.

7.3.2.9 Conclusions

Based on the frequency and magnitude with which a constituent exceeds the target noncancer threshold, it may be concluded that the following constituents are unlikely to pose adverse health effects to hypothetical future groundwater users at the site: barium, cadmium, cobalt, copper, nickel, nitrate as nitrogen, selenium, silver, and thallium. Accordingly, the results of the risk assessment would support that these constituents are not COCs and, thus, is it recommended that they not be carried forward to the CMS/FS.

Although the risk assessment supports that neither selenium nor nitrate as nitrogen represent a significant source of noncancer hazard to future hypothetical groundwater users at the site (selenium exceeds a HI of

1.0 at only one well, [TW-1, with a selenium HI of 2.0], and nitrate as nitrogen exceeds an HI of 1.0 at one well [PT-8M, with a nitrate as nitrogen HI of 1.3]) and, therefore are not COCs, the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) concluded that both selenium and nitrate as nitrogen could potentially be related to releases from SWMU 1/AOC 1. Although the risk assessment concludes that these two compounds are not believed to be a source of significant risk/noncancer hazard and, thus, would not be considered COCs, because each exceeds an HI of 1.0 at one well, DTSC has directed PG&E to carry selenium and nitrate as nitrogen forward into the CMS/FS.

7.3.3 Low to Moderate Level of Potential Risk/Hazard

The constituents in this category fall into one of two subcategories:

- Constituents that contribute materially to an elevated estimated cumulative noncancer hazard with low frequency – at less than 5% of the individual groundwater wells; at those few wells where these constituents do contribute materially, the average (individual-chemical) estimated HI is moderate – on the order of 5 to 50. The one constituent in this category, fluoride, is discussed further below.

- Constituents that contribute materially to an elevated estimated cumulative noncancer hazard at moderate frequency – between 5% and 50% of the individual groundwater wells; at those wells where these constituents do contribute materially, the average (individual-chemical) estimated HI is low – on the order of 0.5 to 5. Therefore, constituents in this subcategory may be considered to be a low to moderate potential risk/hazard to hypothetical future groundwater users at the site. The three constituents in this category—lead, molybdenum, and vanadium—are discussed further below.

7.3.3.1 Fluoride

As indicated in Table 7-6, fluoride is a material contributor to elevated estimated noncancer hazard at five (4.8%) of 104 groundwater wells where it was sampled and analyzed for. At these particular wells, the average HI attributable to fluoride is estimated to be 12. Therefore, it may be concluded that the frequency of contribution of fluoride to elevated estimated cumulative noncancer hazard is low, and the magnitude of the contribution is moderate. The magnitude of the estimated potential noncancer HIs attributable to fluoride at individual wells are depicted in Figure 7-7. Four of the five wells where fluoride exceeds an HI of 1.0 are located on PG&E land or USBLM land that is located west of the compressor station, where residential land use is not considered a reasonable future land use.

A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. As summarized in Table 7-6, the results of this sensitivity analysis indicate that fluoride would be a material contributor to elevated estimated noncancer hazard at five (4.8%) of 104 groundwater wells, with an average

estimated HI of 8.4 if fluoride EPCs were based on average rather than maximum concentrations. These results indicate that the estimated noncancer hazards associated with fluoride are not sensitive to the use of maximum concentrations.

As indicated in Table 7-6, fluoride was detected on a site-wide basis in 426 (87%) of 491 samples analyzed for fluoride and was detected above background levels in five (4.8%) of the 104 wells sampled for fluoride. The site-wide statistics further support the conclusion that, although fluoride has been detected with low frequency across the site at concentrations above background levels, it has been detected both within and outside of the hexavalent chromium plume at levels that are slightly elevated relative to the threshold HI of 1.0. It is worth noting, however, that similar to arsenic, the RBC for fluoride of 0.93 mg/L (presented in Appendix Q) is actually lower than the background concentrations at the site. Specifically, the mean and UTL fluoride concentrations in the background dataset are 1.4 mg/L and 7.4 mg/L, which would correspond to estimated noncancer HIs of 1.5 and 7.6, respectively.

Based on these analyses, it may be concluded that fluoride has been detected in site groundwater with low frequency at moderately elevated levels relative to the target noncancer hazard threshold of 1.0 and, therefore, could be considered to be a low to moderate potential hazard to hypothetical future groundwater users at the site.

The RFI/RI Volume 2 (CH2M HILL, 2009a) presents a detailed discussion of the distribution of fluoride detected across the site and provides some explanation as to why elevated fluoride may be present. As stated in the RFI/RI Volume 2, the concentration of fluoride in well MW-10 (located near the site of the historical wastewater discharge) has been consistently above the UTL, in the range between 10 and 24.6 mg/L. However, the distribution of fluoride downgradient of this well is not consistent with what would be expected from historical discharge. Concentrations of fluoride in all other wells within the hexavalent chromium plume are below the UTL. Accordingly, as stated in the RFI/RI Volume 2 (CH2M HILL, 2009a), the occasional fluoride concentrations elevated above the UTL appear to be reflective of natural variation rather than an association with the BCW discharge. The elevated concentrations at the New Ponds (MW-6) and MW-33-40 outside the plume support natural variation at the MW-10 area. Due to the inconsistent, non-plume-like nature of the concentration distribution, fluoride is not considered a COPC in the RFI/RI Volume 2 (CH2M HILL, 2009a).

In sum, although fluoride is detected in a few wells (less than 5%) at levels that are categorized as a moderate potential hazard to future hypothetical groundwater users (i.e., average HI in these wells of 12), the weight of the evidence presented in the RFI/RI Volume 2 supports that the distribution of fluoride is reflective of natural variation rather than an association with the BCW discharge (CH2M HILL, 2009a). Accordingly, fluoride is not considered a COC and, thus, it is recommended fluoride not be carried forward to the CMS/FS.

7.3.3.2 Lead

As described in Section 6.3, the noncarcinogenic hazard from lead is not evaluated using the traditional RfD approach and, as such, cannot be cumulatively assessed with the other COPCs (see Appendix P for details). As indicated in Table 7-6, lead is estimated to be present in concentrations that exceed the CAL at seven (8.4%) of 83 groundwater wells where it was sampled and analyzed for. At these particular wells, the average ratio of the estimated lead EPC to the lead CAL is 2.7. Therefore, it may be concluded that the frequency of occurrence of lead concentrations estimated to be in excess of the CAL is moderate, and the magnitude of the exceedances are low. Estimated lead EPCs at individual wells are depicted in Figure 7-4. As indicated in Figure 7-4, the locations where lead is estimated to exceed the CAL are limited to the floodplain, both within and outside of the hexavalent chromium plume, far from the discharge area. Two of these wells where lead is estimated to exceed the CAL are located on USFWS land, where residential land use is not considered a reasonable future land use.

A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. As summarized in Table 7-6, the results of this sensitivity analysis indicate lead is present in concentrations in excess of the CAL at two (2.4%) of 83 groundwater wells, with an average ratio of lead EPC to lead CAL of 1.8 if lead EPCs were based on average rather than maximum concentrations. As indicated in Appendix P, both of these wells are located outside of the hexavalent chromium groundwater plume (i.e., MW-30-30, and MW-22). These results indicate that identification of wells that are estimated to exceed the CAL for lead is very sensitive to the use of maximum concentrations. Indeed, using the results of the sensitivity analysis would result in a change of category for lead from a low-to-moderate level of potential hazard, to a low potential hazard.

As indicated in Table 7-6, lead was detected on a site-wide basis in 62 (13%) of 474 samples analyzed for lead and was detected above background levels in 36 (43%) of the 83 wells sampled lead, which supports that lead has been detected at moderate frequency at levels in excess of background concentrations and at low frequency at levels in excess of analytical detection limits.

Based on the analyses, it may be concluded that lead is present in site groundwater at a moderate number of locations at levels that slightly exceed the CAL and should be considered to be low to moderate potential hazard to hypothetical future groundwater users at the site. However, this conclusion is based on the use of maximum detected concentrations at each of the seven wells where lead has been detected above the CAL. Use of the average concentration at each well, instead of maximum detected concentration, reduces the number of potentially significant wells to two; and at these two wells, the average lead concentration exceeds the CAL by between factors of 1.1 (MW-22) and 2.5 (MW-30-3). Therefore, the sensitivity analysis would suggest that lead is a low potential hazard and is unlikely to pose adverse health effects to hypothetical future groundwater users at the site.

The RF/RI Volume 2 (CH2M HILL, 2009a) presents a detailed discussion of the lead detected across the site. As stated in the RFI/RI Volume 2, well locations where lead exceeds the background UTL occur primarily in the shallow depth zone, are located both inside and outside the plume, and show an overall discontinuous distribution (CH2M HILL, 2009a). Concentrations are variable and most locations have less than 50% detections, suggesting colloidal influence in the reported concentrations (CH2M HILL, 2009a). Lead is known to have a high affinity for adsorption to mineral surfaces compared to other trace metals, with essentially 100% adsorbed at pH 7 in laboratory studies (CH2M HILL, 2009a). Given these properties, any lead that may have been disposed at SWMU 1 that was not adsorbed by vadose zone minerals would not be expected to travel far in groundwater beneath BCW (CH2M HILL, 2009a). The fact that the highest concentrations of lead were found in wells far downgradient of SWMU 1 (i.e., MW-30-30 and MW-22) is in conflict with lead's low mobility. In sum, the RFI/RI Volume 2 (CH2M HILL, 2009a) concludes the pattern of concentrations of lead does not match that of the chromium plume, nor does it suggest another clearly definable facility source. The distribution is discontinuous in space, suggesting a combination of natural variation and of sampling artifacts from colloid influences, and on the basis of these observations, the RFI/RI Volume 2 states that lead was not recommended for further consideration as a COPC in groundwater related to SWMU 1/AOC 1 or SWMU 2 (CH2M HILL, 200a9).

In sum, although lead is detected in a moderate number of wells (approximately 8.4%) at levels that are categorized as a low potential hazard to future groundwater users (i.e., estimated EPC exceeds the CAL at between 2 [sensitivity analysis] and 8 [main analysis] wells), the weight of the evidence presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) supports that the presence of lead is reflective of a combination of natural variation and or sampling artifacts from colloid influences (CH2M HILL, 2009a). Accordingly, lead is not considered a COC and, thus, it is recommended that lead not be carried forward to the CMS/FS.

7.3.3.3 Molybdenum

As indicated in Table 7-6, molybdenum is a material contributor to elevated estimated noncancer hazard at 17 (20%) of 83 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to molybdenum is 1.1. As described in Appendix P, the molybdenum-specific estimated HIs exceed the threshold of 1.0 in six wells, ranging from 1.1 to 2.5. As shown on Figure 7-8, of the six locations where the estimated HIs for molybdenum exceed 1.0, four are located within the hexavalent chromium plume, and two are located outside of the hexavalent chromium plume, in the areas of the new evaporation ponds or the floodplain. Two of the six wells where the estimated HIs exceed 1.0 are located on PG&E land or USBLM land that is located west of the compressor station, where residential land use is not considered a reasonable future land use. Based on the above, it may be concluded that the frequency of contribution of molybdenum to elevated estimated cumulative noncancer hazard is moderate, and the magnitude of the contribution is low.

A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. As

summarized in Table 7-6, the results of this sensitivity analysis indicate that molybdenum would be a material contributor to elevated noncancer hazard at 14 (17%) of 83 groundwater wells, with an average estimated HI of 1.0 if molybdenum EPCs were based on average rather than maximum concentrations. These results indicate that the estimated noncancer hazards associated with molybdenum are slightly sensitive to the use of maximum concentrations.

As indicated in Table 7-6, molybdenum was detected on a site-wide basis in 528 (94%) of 563 samples analyzed for molybdenum and was detected above background levels in 38 (46%) of the 83 wells sampled for molybdenum, which supports that molybdenum has been detected at moderate frequency at levels in excess of background concentrations.

Based on these analyses, it may be concluded that molybdenum has been detected in site groundwater at a moderate number of locations across the site at slightly elevated levels relative to the threshold HI of 1.0 and, therefore, should be considered a low to moderate potential hazard to hypothetical future groundwater users at the site.

The RFI/RI Volume 2 (CH2M HILL, 2009a) presents a detailed discussion regarding the presence of molybdenum across the site. As stated in the RFI/RI Volume 2, molybdenum has been used at the compressor station and was identified in a facility wastewater sample from 2005. As discussed in the RFI/RI Volume 2 (CH2M HILL, 2009a), there are elevated concentrations in the BCW area where the original chromium discharge occurred, and there are more wells with molybdenum above background within the plume (12) than outside the plume (7). Because of this apparent grouping, PG&E further evaluated whether the molybdenum distribution in groundwater may be related to site activity.

The use of molybdenum at the facility, its detection in more recent wastewater samples, and its presence above the background UTL in a number of site wells suggest that it may merit further assessment (CH2M HILL, 2009a). While the elevated molybdenum distribution within the plume area is inconsistent, with very low levels in wells down the BCW from SWMU 1, there are enough plume wells with elevated molybdenum to suggest that it cannot be ruled out as potentially related to SWMU 1/AOC 1 at this time. Accordingly, the RFI/RI Volume 2 (CH2M HILL, 2009a) recommends that molybdenum remain a COPC in groundwater related to SWMU 1/AOC 1. Additional Title 22 metals data have been collected and will be reported to further evaluate this conclusion.

Because molybdenum was not be ruled out as a COPC in the RFI/RI, and because molybdenum is an essential nutrient present in a moderate number of wells (i.e., greater than 5% but not more than 20%) at concentrations that are estimated to slightly exceed the target HI of 1.0 (with the estimated HIs at these wells ranging from 1.1 to 2.5 for molybdenum), further evaluations were conducted and are discussed in Section 7.4 and Appendix M. As molybdenum is estimated to be categorized as only a low to moderate potential hazard to future hypothetical groundwater users, the purpose of these additional evaluations is to more fully

explore the uncertainties associated with the estimated noncancer hazards calculated for molybdenum, and provide the risk managers with a more in-depth evaluation of the weight of the evidence with respect to the presence and potential future health hazards associated with molybdenum.

7.3.3.4 Vanadium

As indicated in Table 7-6, vanadium is a material contributor to elevated estimated noncancer hazard at 17 (20%) of 83 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to vanadium is 1.1. As indicated in Appendix P, the vanadium-specific HIs are estimated to exceed the threshold of 1.0 in seven of these 17 wells, ranging from 1.1 to 2.7. Therefore, it may be concluded that the frequency of contribution of vanadium to elevated estimated cumulative noncancer hazard is moderate, and the magnitude of the contribution is low. The magnitude of the noncancer HIs attributable to vanadium at individual wells are depicted in Figure 7-9. The locations where vanadium is a material contributor to elevated estimated noncancer hazard include the area of the IM injection, the floodplain area outside of the hexavalent chromium plume, and within the hexavalent chromium plume area. Four of the seven wells where the HIs are estimated to exceed 1.0 are located on PG&E or USFWS land, where residential land use is not considered a reasonable future land use.

A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. As summarized in Table 7-6, the results of this sensitivity analysis indicate that vanadium would be a material contributor to elevated estimated noncancer hazard at nine (11%) of 83 groundwater wells, with an average estimated HI of 0.87 if vanadium EPCs were based on average rather than maximum concentrations. These results indicate that estimated noncancer hazards associated with vanadium are sensitive to the use of maximum concentrations, but that the overall categorization of this constituent would not change.

As indicated in Table 7-6, vanadium was detected on a site-wide basis in 372 (81%) of 462 samples analyzed for vanadium and was detected above background levels in 19 (23%) of the 83 wells sampled for vanadium, which supports that vanadium has been detected at low frequency at levels in excess of background concentrations.

Based on these analyses, it may be concluded that vanadium is present in site groundwater at a moderate number of locations at slightly elevated levels relative to the noncancer threshold of 1.0 and should be considered a low to moderate potential hazard to hypothetical future groundwater users at the site.

The RFI/RI Volume 2 (CH2M HILL, 2009a) presents a detailed discussion regarding the presence of vanadium across the site. As discussed in the RFI/RI Volume 2, average vanadium concentrations are below the background UTL in all monitoring wells except well MW-22 in the southern floodplain. The elevated average in this well was driven by one anomalous sample result.

Of the 27 wells that have had at least one sample exceeding the vanadium UTL, 15 are outside the hexavalent chromium plume and 12 are either inside the hexavalent chromium plume or floodplain wells in the downgradient path of the plume (CH2M HILL, 2009a). Only five of the 27 wells have had two samples exceeding UTL; the remainder of wells have had only one. Of the 14 samples in plume or plume flowpath wells that have exceeded UTL, 10 were from a single sampling event in March 2005. Nine of these ten were reported as anomalous at the time and re-sampling in June 2005 showed vanadium values back in normal range (below UTL), suggesting that laboratory analytical issues were the source of the elevated concentrations. Overall, of the 32 groundwater samples that have exceeded vanadium UTL, 27 of them have occurred in just four sampling events, all in 2005. On the basis of the suspected laboratory issues, the inconsistent nature of elevated vanadium occurrence, and the distribution of wells with elevated samples (i.e., more exceedances occur outside the area influenced by SWMU 1 and SWMU 2), the distribution of elevated vanadium is concluded to be due to natural variation and in some cases from analytical issues. Therefore, the RFI/RI Volume 2 concludes that vanadium is not considered a COPC in groundwater related to SWMU 1/AOC 1 or SWMU 2 (CH2M HILL, 2009a).

In sum, although vanadium is detected in a moderate number of wells (approximately 20%) at levels that are categorized as a low potential hazard to future groundwater users (i.e., average estimated HI in these wells of 1.1), the weight of the evidence presented in the RFI/RI Volume 2 supports that the distribution of elevated vanadium is due to natural variation and in some cases from analytical issues and not related to discharges to SWMU 1/AOC 1 or SWMU 2 (CH2M HILL, 2009a). Accordingly, vanadium is not considered a COC and, thus, it is recommended that vanadium not be carried forward to the CMS/FS.

7.3.3.5 Conclusions

Based on the frequency and magnitude with which a constituent exceeds the target noncancer threshold, it may be concluded that the following constituents are a low to moderate potential hazard to future hypothetical groundwater users: fluoride, lead, molybdenum, and vanadium. Although the quantitative estimates of noncancer hazard to a future hypothetical groundwater user indicate that these constituents are considered a low to moderate potential hazard were someone in the future to use the groundwater as a potable source of domestic water, the information presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) supports that with the possible exception of molybdenum, the presence of these constituents does not coincide with historical discharges to the BCW or the inactive injection well PGE-8. The RFI/RI Volume 2 (CH2M HILL, 2009a) concludes that local variability of naturally occurring groundwater in the basin, colloidal breakthrough, or potential laboratory issues are the explanation for the presence of these constituents in groundwater. Accordingly, with the possible exception of molybdenum, these chemicals are not considered COCs and, thus, it is recommended that these chemicals not be carried forward to the CMS/FS.

As described above, additional evaluations of molybdenum are presented below in Section 7.4 to more fully explore the uncertainties associated with the estimated noncancer hazards calculated for molybdenum and

provide the risk managers with a more in-depth evaluation of the weight of the evidence with respect to the presence and potential future health hazards associated with the molybdenum including an evaluation of the essential nutrient related features of this compound.

7.3.4 Moderate Level of Potential Risk/Hazard

The constituents in this category fall into one of two sub-categories:

- Constituents that contribute materially to an elevated estimated cumulative noncancer hazard with moderate frequency – between 5% and 50% of the individual groundwater wells; at those wells where these constituents do contribute materially to elevated hazard/risk, the average (individual-chemical) estimated HI is moderate – on the order of 5 to 50. The constituent in this sub-category is antimony.

- The second sub-category consists of arsenic, the sole oral carcinogenic COPC included in this GWRA. Arsenic contributes materially to elevated estimated cumulative noncancer hazard and cancer risk with low frequency – at less than 5% of the individual groundwater wells. At those few wells where arsenic does contribute materially, the average estimated HI is moderate and the average estimated cancer risk is high, as described further below.

Overall, the constituents in this category (i.e., antimony and arsenic) may be considered to be a moderate level of potential risk/hazard to hypothetical future groundwater users at the site.

7.3.4.1 Antimony

As indicated in Table 7-6, antimony is a material contributor to elevated noncancer hazard at seven (10%) of 68 groundwater wells where it was sampled and analyzed for. At these particular wells, the estimated average HI attributable to antimony is 9.6. As indicated in Appendix P, the antimony-specific HIs are estimated to exceed the threshold of 1.0 in seven of the wells, ranging from 1.4 to 25. Therefore, it may be concluded that the frequency of contribution of antimony to elevated noncancer hazard is moderate, and the magnitude of the contribution is moderate. The magnitude of the noncancer HIs attributable to antimony at individual wells are depicted in Figure 7-10. As indicated, five of the wells, where the estimated HIs for antimony exceed the threshold HI of 1.0, are located north of the railroad on USBLM land.

The well-by-well hazard analysis presented in Appendix P indicates that antimony was detected in either one or two samples at each of the seven wells where antimony contributes materially to elevated noncancer hazard, suggesting that the presence of antimony, both across the site and at individual wells, is sporadic and inconsistent. Due to the small sample sizes at each well, antimony EPCs are conservatively based on maximum detected concentrations. A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or

fewer than five detects. As summarized in Table 7-6, the results of this sensitivity analysis indicate that antimony would be a material contributor to elevated estimated noncancer hazard at three (4.4%) of 68 groundwater wells, with an average estimated HI of 7.9 if antimony EPCs were based on average rather than maximum concentrations. These results indicate that identification of wells where antimony is a material contributor to elevated estimated cumulative noncancer hazard is sensitive to the use of maximum concentrations. Indeed, using the results of the sensitivity analysis would result in a change in category for antimony from a moderate potential level of concern to a low-to-moderate potential level of concern.

As indicated in Table 7-6, antimony was detected on a site-wide basis in nine (2.3%) of 384 samples analyzed for antimony and was detected above background levels in eight (12%) of the 68 wells sampled for antimony, which supports that antimony has been detected at low frequency at levels in excess of both background concentrations and analytical detection limits.

Based on the analysis, it may be concluded that antimony has been detected with moderate frequency at the site at levels in excess of the threshold HI, and when it has been detected, it has been detected at levels that are moderate and, thus, should be considered to be a moderate potential hazard to hypothetical future groundwater users at the site. However, this conclusion is based on the use of maximum detected concentrations at each of the seven wells where antimony contributes materially to elevated estimated noncancer hazard. Use of the average concentration at each well, instead of maximum detected concentration, reduces the number of potentially significant wells to three, and at these three wells, the average estimated noncancer HI is 7.9. Therefore, the sensitivity analysis would suggest that antimony is of a low-to-moderate potential hazard to future hypothetical groundwater users at the site.

The RFI/RI Volume 2 presents a discussion of the distribution of antimony detected across the site (CH2M HILL, 2009a). As described in the RFI/RI Volume 2, there were only three wells with average concentrations exceeding the antimony UTL (and applicable or relevant and appropriate requirement [ARAR]) (MW-20-100, TW-2S, and TW-2D), all located on the MW-20 bench, and these exceedances were driven by a single sample from each well. Five other wells had one or two samples above background and the chemical-specific ARAR, but the remainder of samples from these wells were below reporting limits. On the basis of the infrequent UTL exceedances, the scattered distribution of wells with elevated samples, and the lack of a clear source, the RFI/RI Volume 2 concludes that antimony is not a COPC in groundwater related to SWMU 1/AOC 1 or SWMU 2.

Although antimony is detected in a moderate number of wells (approximately 10%) at levels that are categorized as a moderate potential hazard to future groundwater users (i.e., average estimated HI in these wells of 9.6), these conclusions are based on infrequent detections and the use of maximum detected values at most of the wells. The sensitivity analysis reduces the number of wells where antimony is estimated to exceed the target HI of 1.0 from seven to three. In sum, the weight of the evidence presented in the RFI/RI Volume 2 supports that the distribution of elevated antimony is due to natural variation, lab error, or colloidal

breakthrough, and is not associated with a clear source (CH2M HILL, 2009a). Accordingly, antimony is not considered a COC and, thus, it is recommended that antimony not be carried forward to the CMS/FS.

7.3.4.2 Arsenic

Arsenic is notably the only COPC in site groundwater that is classified as a carcinogen (oral), and for which potential cancer risks have been estimated. Therefore, an evaluation of the potential significance of this constituent in site groundwater considers results of both the cancer risk and noncancer hazard analyses.

7.3.4.2.1 Cancer Risk

The estimated potential cancer risks to hypothetical future groundwater users, associated with exposures to arsenic in well-specific groundwater, are summarized in Table 7-1. As discussed further below, arsenic has been detected above background in only three of the 110 groundwater wells for which arsenic was sampled: MW-12, MW-24A, and MW-43-25 with representative EPCs of 0.11 mg/L, 0.034 mg/L, and 0.024 mg/L, respectively. For the hypothetical future groundwater user, the estimated well-specific potential cancer risks range from 3.4×10^{-3} to 1.5×10^{-2} across these three wells; the maximum estimated potential cancer risk of 1.5×10^{-2} occurs at well MW-12 (which is inside the plume), located south of Interstate 40 on Federal property leased by CalTrans. These estimated cancer risks are above the upper end of the 1×10^{-6} to 1×10^{-4} "risk management range" typically endorsed by regulatory agencies and are, therefore, considered to be a high potential risk to hypothetical future groundwater users. Note, however, that the background risk level for arsenic is also greater than the upper end of the risk management range at 3.4×10^{-3}.

7.3.4.2.2 Noncancer Hazard

As indicated in Table 7-6, arsenic is a material contributor to elevated estimated noncancer hazard at three (2.7%) of 110 groundwater wells where it was sampled and analyzed for. The average estimated HI attributable to arsenic at these wells is 12. Therefore, it may be concluded that the frequency of contribution of arsenic to elevated noncancer hazard is low, and the magnitude of contribution is moderate. The magnitude of the estimated noncancer HIs attributable to arsenic at individual wells are depicted in Figure 7-11.

A sensitivity analysis is presented in Appendix G with EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. As summarized in Table 7-6, the results of this sensitivity analysis indicate that arsenic would be a material contributor to elevated estimated noncancer hazard at three (2.7%) of 110 groundwater wells, with an average estimated HI of 10 if arsenic EPCs were based on average rather than maximum concentrations. These results indicate that the estimated noncancer hazards associated with arsenic are not sensitive to the use of maximum concentrations.

7.3.4.2.3 Comparisons to Background

As indicated in Table 7-6, arsenic was detected on a site-wide basis in 190 (41%) of 460 samples analyzed for arsenic and was detected above background levels in three (2.7%) of the 110 wells sampled for arsenic. Specifically, as identified on Table 4-2, it is notable that the EPCs for two of the three wells where arsenic was detected above background (MW-24A and MW-43-25) are only marginally greater than the background UTL, with reported EPCs of 0.0244 mg/L and 0.034 mg/L, respectively. In contrast, MW-12 has a reported EPC for arsenic of 0.11 mg/L, a level which is approximately 5 times greater than the background UTL of 0.0243 mg/L. These site-wide statistics further support the conclusion that arsenic has been detected at low frequency at the site at levels that are in excess of background but has been detected at elevated concentrations more than 5 times greater than background at one location (MW-12, within the hexavalent chromium plume)[15].

7.3.4.2.4 Conclusions for Arsenic

Based on these analyses, it may be concluded that arsenic has been detected at low frequency at the site, at concentrations that are high relative to the cancer risk management range. It should be noted, however, that arsenic has been detected at two locations at concentrations that are only slightly above background (i.e., at two locations where concentrations are 1.01 and 1.4 times above background), and at only one location (MW-12) where concentrations are roughly 5 times above background. Accordingly, the presence of arsenic at location MW-12 should be considered a moderate potential risk/hazard to hypothetical future groundwater users at the site.

The RFI/RI Volume 2 (CH2M HILL, 2009a) provides a detailed discussion on the distribution of arsenic in groundwater and the potential sources of the arsenic. As discussed in the RFI/RI Volume 2, the background UTL for arsenic in the area is 24.3 µg/L, which exceeds the MCL of 10 µg/L. As such, site groundwater arsenic concentrations exceeding ARARs are to be expected and do occur in various wells. As stated in the RFI/RI Volume 2 (CH2M HILL, 2009a), there is little evidence that correlates these wells with SWMU 1/AOC 1 or SWMU 2. Only one site well, MW-12, exceeds the background UTL. There is no current indication that the facility used arsenic. However, arsenic was commonly used as a weed killer around railroad tracks and highways up until the 1970s, and the original railroad line and later Route 66 followed the path of present-day Park Moabi Road. Well MW-12 is located in a depression adjacent to Park Moabi Road,

[15] As discussed in Appendix Q, the RBCs for arsenic are actually well below background concentrations (RBC based on cancer effects is 0.0000071 mg/L; RBC based on noncancer effects is 0.0047 mg/L). Accordingly, for arsenic, the wells containing arsenic above background concentrations indicate unacceptable risk/hazard. Further, average concentrations of arsenic across the site, inclusive of wells that contain arsenic below background, may also indicate unacceptable risk/hazard, because the RBCs are below background.

and it is reasonable that the arsenic that may have been applied to the railroad track area (and later Route 66) leached to groundwater in this depression, which forms a pond following storm events. There are similarly elevated arsenic concentrations in wells near this transportation corridor on the Arizona side of the Colorado River. Whatever the actual source of arsenic in the vicinity of MW-12, it does not appear to be associated with a source in the BCW. Outside of this area, the distribution of arsenic is inconsistent, and not suggestive of a plume distribution associated with the BCW discharge (CH2M HILL, 2009a).

Average concentrations of arsenic in other site monitoring wells are below 10 µg/L, with the exception of some of the New Ponds wells and in-situ pilot study wells affected by temporarily altered geochemical conditions. The latest arsenic data has dropped to below detection limits and, thus, the UTL and ARAR. Whatever the source of arsenic in groundwater, the RFI/RI Volume 2 concludes that it does not appear to be associated with facility operations or the chromium plume (CH2M HILL, 2009a). Therefore, in the RFI/RI Volume 2, arsenic is not recommended for consideration as a COPC in groundwater related to SWMU 1/AOC 1 or SWMU 2 (CH2M HILL. 2009a).

In sum, although arsenic is detected in three wells (approximately 2.7% of all wells) at levels that are at or above background concentrations and would, thus, be categorized as a moderate potential hazard to future groundwater users, the weight of evidence presented in the RFI/RI Volume 2 supports that the arsenic does not appear to be associated with facility operations or the chromium plume (CH2M HILL, 2009a). Accordingly, arsenic is not considered a COC and, thus, it is recommended that arsenic not be carried forward to the CMS/FS.

7.3.4.3 Conclusions

Based on the frequency and magnitude with which a constituent is estimated to exceed the target noncancer or cancer risk threshold, it may be concluded that the following constituents are a moderate potential risk/hazard to future hypothetical groundwater users: arsenic and antimony. Although the quantitative estimates of noncancer hazard and cancer risk to a future hypothetical groundwater user indicate that these constituents are considered a moderate potential risk/hazard, exceedances are discontinuous and do not coincide with the historical discharges to the BCW, the inactive injection well PGE-8, or with other site-related sources. The sampling data generally suggest either a non-PG&E source, natural elevated concentrations, or localized anomalous detections. Based on the discontinuous distribution or localized occurrence, and the lack of identifiable sources or association with facility operations, the RFI/RI Volume 2 concludes that arsenic and antimony are not COPCs in groundwater related to SWMU 1/AOC 1 or SWMU 2 (CH2M HILL, 2009a). Accordingly, antimony and arsenic are not considered COCs and, thus, it is recommended that these chemicals not be carried forward to the CMS/FS.

7.3.5 Moderate to High Level of Potential Risk/Hazard

The constituents in this category contribute materially to elevated estimated noncancer hazard with moderate frequency – between 5% and 50% of the individual groundwater wells. At those wells where these constituents do contribute materially to an elevated estimated noncancer hazard, the average (individual-chemical) estimated HI is high – greater than 50. Therefore, on a site-wide basis, these constituents may be considered to be a moderate to high potential risk/hazard to hypothetical future groundwater users at the site. The constituent in this category is hexavalent chromium.

As indicated in Table 7-6, hexavalent chromium is a material contributor to elevated estimated noncancer hazard at 65 (39%) of 167 groundwater wells where it was sampled and analyzed for. At these particular wells, the average estimated HI attributable to hexavalent chromium is 66. Therefore, it may be concluded that the frequency of contribution of hexavalent chromium to elevated noncancer hazard is moderate, and the magnitude of the contribution is high. The magnitude of the estimated noncancer HIs attributable to hexavalent chromium at individual wells are depicted in Figure 7-12.

A sensitivity analysis is presented in Appendix G with estimated EPCs based on average, rather than maximum, concentrations for those constituent datasets with fewer than eight values or fewer than five detects. As summarized in Table 7-6, the results of this sensitivity analysis indicate that hexavalent chromium would be a material contributor to elevated noncancer hazards at 64 (38%) of 167 groundwater wells, with an average estimated HI of 65 if hexavalent chromium EPCs were based on average rather than maximum concentrations. These results indicate that estimated noncancer hazards associated with hexavalent chromium are not sensitive to the use of maximum concentrations.

As indicated in Table 7-6, hexavalent chromium was detected on a site-wide basis in 1,650 (59%) of 2,780 samples analyzed for hexavalent chromium and was detected above background levels in 69 (41%) of the 167 wells sampled for hexavalent chromium. This site-wide analysis further supports the conclusion that hexavalent chromium has been detected at moderate frequency at the site at levels that are in excess of background concentrations.

Based on these analyses, it may be concluded that hexavalent chromium has been detected with a moderate frequency at the site at levels that are estimated to be relatively high in comparison to the target noncancer threshold and, therefore, should be considered a moderate to high potential risk/hazard to hypothetical future groundwater users at the site.

7.4 Risk/Hazard Results Estimated Exclusively for SWMU 1/AOC 1-Related Constituents

Based on information in the RFI/RI Volume 2 (CH2M Hill, 2009a), the RFI/RI Volume 2 recommends that only selenium, molybdenum, nitrate as nitrogen, and hexavalent chromium be considered COPCs

associated with groundwater at SWMU 1/AOC 1. Cumulative cancer risks and noncancer HIs, discussed in Section 7.3, are estimated for all COPCs identified in Section 4 of this GWRA. The final list of constituents to be carried forward to the CMS/FS, however, will consist of those constituents that could potentially pose an unacceptable risk/hazard to future hypothetical groundwater users and that may be associated with SWMU 1/AOC 1, as defined in the RFI/RI Volume 2 (CH2M HILL, 2009a).

As described in previous sections, there are a total of seven constituents that were detected in groundwater at concentrations that could pose potential risk/hazard to future hypothetical groundwater users: fluoride, lead, molybdenum, and vanadium are estimated to be a low to moderate potential risk/hazard; arsenic and antimony are estimated to be a moderate potential risk/hazard; and hexavalent chromium is estimated to be a moderate to high potential risk/hazard. As detailed in the RFI/RI Volume 2 (CH2M HILL, 2009a), the weight of the evidence supports that, of these seven constituents, only hexavalent chromium and, potentially, molybdenum are considered to be associated with groundwater at SWMU 1/AOC 1.

Accordingly, as molybdenum was associated with a low to moderate potential hazard to future hypothetical groundwater users, aspects of the hazard calculation for molybdenum were evaluated in more depth and are discussed below: (1) the contributions to cumulative hazard estimates for molybdenum, when considering only those constituents that are related to SWMU 1/AOC 1 and a discussion of the implications of summing the noncancer hazards estimated for molybdenum with the other three constituents related to SWMU 1/AOC 1 (i.e., hexavalent chromium, selenium, and nitrate as nitrogen); and (2) the relationship of the toxicity value for molybdenum (i.e., the RfD) to essential nutrient information and the associated contribution to potential health impacts. The latter evaluation, presented in Appendix M, complies with USEPA metals risk assessment guidance (USEPA, 2007b). We acknowledge, however, that this essential nutrient evaluation of molybdenum, conducted in addition to the standard baseline evaluation for molybdenum, is not a typical component of DTSC's standard risk assessment protocols, although an essential nutrient screen is not an unusual request for USDOI sites. The purpose of these additional evaluations is to more fully explore the uncertainties associated with the estimated noncancer hazards calculated for molybdenum, and provide the risk managers with a more in depth evaluation of the weight of the evidence with respect to the presence and potential future health hazards associated with the molybdenum.

The result of these evaluations, when viewed collectively (see Appendix M for details), supports that the frequency with which molybdenum contributes materially to elevated estimated cumulative noncancer hazard in individual wells is low, and the magnitude of the contribution is low. In sum, these additional evaluations strongly suggest that molybdenum is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water.

7.4.1 Contribution of Molybdenum with Other Facility Related Compounds to Estimated Hazard

The initial categorization of molybdenum as a low to moderate potential hazard to future hypothetical groundwater users included the cumulative hazards at each well incorporating hazards associated with the presence of other COPCs that are not considered to be related to historical releases from SWMU 1/AOC 1 (e.g., antimony, vanadium). In this section, cumulative risks/hazards were re-evaluated for molybdenum under the assumption that the only constituents potentially associated with SWMU 1/AOC 1 are hexavalent chromium, molybdenum, nitrate as nitrogen and selenium. The details of this analysis are presented in Appendix R, and the key pertinent findings regarding molybdenum are summarized below.

Focusing only on constituents associated with SWMU 1/AOC 1, molybdenum is a material contributor to elevated estimated noncancer hazard at 13 (16%) of 83 groundwater wells where it was sampled and analyzed for. At these particular wells, the average HI attributable to molybdenum is 1.2. There are six individual wells where the molybdenum-specific HI exceeds 1.0, ranging from an HI of 1.1 to an HI of 2.5. Therefore, it may be concluded that when looking only at those constituents associated with SWMU 1/AOC 1, the frequency of contribution of molybdenum to elevated estimated cumulative noncancer hazard is moderate, and the magnitude of the contribution is low.

Due to limited number of samples, the noncancer hazards were based on maximum detected concentrations of molybdenum at 10 of the 13 wells where molybdenum was estimated to be a material contributor to elevated noncancer hazard. If molybdenum EPCs were based on average rather than maximum concentrations, molybdenum would be a material contributor to elevated noncancer hazard at nine (11%) of 83 groundwater wells, with an average HI of 1.3. Of the nine wells where molybdenum contributes materially to elevated noncancer hazard, four (MW-38D, MW-38S, MW-44-125 and MW-46-175) had only one sample taken, which presents significant uncertainty in the estimated EPC. Based on these analyses, it may be concluded that molybdenum has been detected in site groundwater at a low to moderate number of locations across the site depending on the analysis used, and at slightly elevated levels relative to the threshold HI of 1.0 when estimated using the current RfD. As stated above, there are six individual wells where the molybdenum-specific HI exceeds 1.0, ranging from an HI of 1.1 to an HI of 2.5.

As indicated in Appendix N, because molybdenum affects different target organs than selenium, nitrate as nitrogen, and hexavalent chromium, focusing on the wells where molybdenum alone exceeds an HI of 1.0 provides a reasonable and appropriate method for identifying those wells where molybdenum could be of potential concern to hypothetical future groundwater users. Incorporating all analyses, and accounting for the uncertainty in these analyses due to the limited sampling at some wells, the level of potential hazard to hypothetical future groundwater users associated with molybdenum can be considered to be between a low and a low to moderate level of hazard. Of the six wells with molybdenum-specific HIs exceeding 1.0, there are only two wells where the there was sufficient monitoring data to estimate noncancer hazards using a 95% UCL OTM: MW- 5 (where molybdenum was detected in 11 out of 12 samples, and the estimated HI

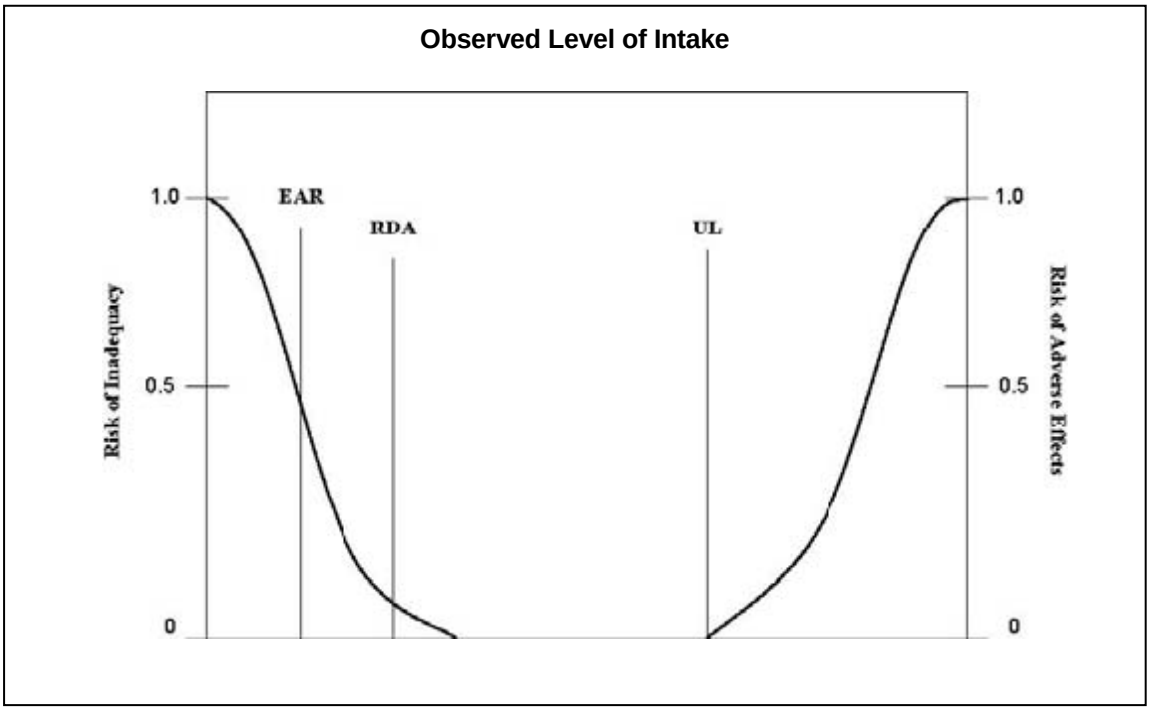
was 1.2), and MW-10 (where molybdenum was detected in 17 out of 17 samples, and the estimated HI was 2.1). Both of these wells are located south of the railroad and are not likely to be used for potable water in the future. The other four wells where the molybdenum-specific HI exceeded 1.0 were all calculated using the maximum detected concentration in that well because of limited data (MW-30-30, molybdenum detected in 2 out of 4 samples; MW-44-115, molybdenum was detected in 3 out of 3 samples; MW-44-125, molybdenum was detected in 1 out of 1 samples; and MW-46-175, molybdenum was detected in 1 out of 1 sample).

For risk management perspective, the sensitivity analysis information in Appendix G was reviewed. If the average EPC from the sensitivity analysis (see Table G-1) is used for MW-30-30 and MW-44-115 rather than the maximum detect, the resulting HIs for those two wells are at or below 1.0. The remaining two wells have only one data point each. Well 46-175, located north of the railroad, is the well with the maximum concentration detected for molybdenum, and consequently, also the maximum HI, based on a single sample at this location.

7.4.2 Essential Nutrient Considerations

According to USEPA risk assessment guidance on metals (USEPA, 2007b) the essentiality of metals should be viewed as part of the overall dose-response relationship, and RfDs should not be set below doses identified as essential. As stated by USEPA, “the risk assessor should use the entire dose-response relationship, from very low (inadequate) doses to high (toxic) doses when determining an acceptable upper exposure limit” (USEPA, 2007b). Therefore, consistent with USEPA guidance on metals risk assessment (USEPA, 2007b), molybdenum and selenium were further evaluated by considering the overall dose-response relationship and evaluating the entire dose-response relationship, from very low (inadequate) doses to high (toxic) doses in order to determine an acceptable upper exposure limit.

The graph below shows a generic example of the relationships between different dose levels and the potential health impacts both beneficial and adverse. The graph also indicates terms typically used to describe dietary criteria for any essential nutrient. The National Academy of Sciences Food and Nutrition Board in conjunction with the Institute of Medicine (IOM) developed the Dietary Reference Intakes (DRIs) program (IOM 2001; USEPA, 2007b). The terms below are used to describe critical points for the full dose response curve (typical example taken from USEPA, 2007b) for an essential nutrient:



- EAR – estimated average requirements formerly called adequate intakes

- RDA – recommended dietary allowance, which replaced Estimated Safe and Adequate Daily Dietary Intakes and are based on the EAR and represent the average daily dietary nutrient intake level sufficient to meet the nutrient requirements of nearly all healthy individuals in a particular life stage and gender group.

- UL – tolerable upper intake level.

The UL is the highest level of daily nutrient intake that is likely to pose no risk of adverse health effects to almost all individuals in the general population. The UL is based on similar risk models that are used by USEPA to set the RfDs and are considered to be protective of the most sensitive members of the general population from adverse effects of high nutrient intake (USEPA, 2007b). As with chemical agents, nutrients can produce adverse health effects in humans if their intake from a combination of food, water, nutrient supplements, and pharmacological agents is excessive. Thus, the IOM establishes the UL such that there is considerable confidence that it lies very near the low end of the theoretical distribution and is the end representing the most sensitive members of the population. For some nutrients, there still may be individuals that are not included in the general distribution because of extreme or distinct vulnerabilities to toxicity. These distinct groups, whose conditions warrant medical supervision, may not be protected by the UL.

However, this protection of population groups is similar to those covered by an RfD (USEPA, 1989, USEPA, 2007b).

Use of the UL as an alternate toxicity value for risk assessment, conducted in addition to the standard baseline toxicity evaluation (i.e., relying upon the RfD presented in the IRIS database), is an approach that is not a typical component of DTSC's standard risk assessment protocols. It does, however, follow USEPA guidance for metals risk assessment.

7.4.2.1 Summary of Molybdenum Essential Nutrient Evaluation

The DRI document (IOM, 2001) includes a profile for molybdenum with a detailed discussion of the current USEPA RfD of 0.005 mg/kg-day, or 0.075 milligrams per day (mg/day) for a 15 kg child. The details of this discussion and the development of the UL, which is higher than the RfD, are presented in Appendix M. In summary, the profile concludes that the human study used as the basis of the RfD (Kovalsky, et al. 1961 as cited in USEPA 2009) is flawed. In addition, other human drinking water studies showed no adverse health responses at much higher doses of molybdenum (Deosthale and Gopalan, 1974 and Turnlaund and Keyes, 2000 as cited in IOM, 2001). Therefore, the DRI document identifies reproductive effects in rats as the most sensitive toxicity endpoint (Fungwe et al, 1990 as cited in IOM, 2001). They applied a UF of 30 (10 for animal to human, and 3 for sensitive subpopulations) to arrive at the UL of 2 mg/day for the adult, 0.3 mg/day for a child 1 to 3 years, and 0.6 mg/day for a child 1 to 6 years (IOM, 2001).

A site with molybdenum impacts to groundwater is under administrative order in USEPA Region 5, and the state of Indiana. This site is called Northern Indiana Public Service Company and Brown, Inc. and site operation activities were related to coal combustion by-products. The RFI work plan for the Indiana site presented a site management strategy including evaluation of molybdenum in groundwater relative to the nutritional status and the UL. This work plan for the Indiana site was accepted by the agency and is currently in the process of being implemented.

Appendix M presents an additional evaluation of potential molybdenum intake for the hypothetical groundwater user. Table M-1 uses the EPC for molybdenum from each well where molybdenum was determined to be above the background UTL, multiplies it by the drinking water intake rate used in the GWRA (2 L/day for adult, 1 L/day for child) to estimate a molybdenum intake in mg/day for the hypothetical groundwater users: adult, child 1 to 3 years, and child 4 to 6 years. The hypothetical intake from groundwater is added to an estimated dietary intake for the receptor as a conservative evaluation of the total potential daily intake for a future resident who could be using the groundwater as a potable source of drinking water. This total estimated molybdenum intake was then compared to the UL for each receptor. The results of this comparison indicate that only one well, MW-46-175 exceeded the UL of 0.3 mg/day for the child 1 to 3 years by 10%, with an estimated total intake (groundwater plus food) of 0.33 mg/day. Please note, this is a well with one data point.

7.4.2.2 Summary and Conclusions of Additional Molybdenum Evaluations

The initial evaluation for all wells and all molybdenum EPCs indicated that molybdenum is a material contributor to elevated estimated noncancer hazard at 17 (20%) of 83 groundwater wells, with an average estimated HI attributable to molybdenum of 1.1 using the current (and likely overly conservative) RfD. As described above in Section 7.4.1, focusing only on constituents associated with releases from SWMU 1/AOC 1, molybdenum is a material contributor to elevated estimated noncancer hazard at between nine (11%) and 13 (16%) of 83 groundwater wells, depending on the methods used to estimate the EPCs. Further, there are six wells where the molybdenum-specific HI exceeds the threshold of 1.0, with estimated HIs ranging from 1.1 to 2.5[16]. The maximum estimated HI associated with molybdenum is 2.5 when estimated using the current RfD. Current toxicological and nutritional information, however, strongly supports that the toxicity information relied upon in estimating the noncancer HIs for molybdenum is outdated, and not reflective of current agency-recommended approaches for integrating essential nutrient information into the risk assessment process (USEPA, 2007b). The evaluation of molybdenum with respect to health protective nutritional intake and the UL indicates that there is only one well (1.2%) that slightly exceeds health protective criteria (exceeding by roughly 10%, which would equate to an "HI" equivalent of 1.1), even when one assumes molybdenum intake from both groundwater and diet. In sum, these additional evaluations strongly suggest that molybdenum is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water. Accordingly, the weight of evidence presented in the risk assessment would support that molybdenum is not a COC, and, thus would not need to be carried forward to the CMS/FS.

Although the weight of evidence presented in the risk assessment supports that molybdenum is unlikely to represent a significant source of noncancer hazard to future hypothetical groundwater users at the site, the RFI/RI concluded that molybdenum could potentially be related to releases from SWMU 1/AOC 1. Although the risk assessment concludes that molybdenum is not believed to be a source of significant risk/noncancer hazard and, thus, would not be considered a COC, because it exceeds an HI of 1.0 at more than one well, DTSC has directed PG&E to carry molybdenum forward into the CMS/FS.

[16] As the target organ impacted by molybdenum is different from the target organs impacted by selenium, nitrate, and hexavalent chromium, it is arguably overly conservative to assess the significance of molybdenum by looking at an HI that is based on the sum of the chemical-specific HIs for these four facility-related constituents. Rather, focusing on the wells where molybdenum alone exceeds an HI of 1.0 provides a reasonable and appropriate method for identifying those wells where molybdenum could be of potential concern to hypothetical future groundwater users. Please refer to Appendix N.

7.4.2.3 Summary of Selenium Essential Nutrient Evaluation

The DRI document (IOM, 2000) includes a profile for selenium with a detailed discussion of the current USEPA RfD of 0.005 mg/kg-day, or 0.075 mg/day for a 15 kg child. The details of this discussion and the development of the UL, which is higher than the RfD, are presented in Appendix M. In summary, the profile concludes that the human study used as the basis of the RfD (Yang et al., 1989a,b as cited in IOM, 2000) is overly conservative to have used a UF of 3 for the Yang study. Although the USEPA-established RfD was based on a no observed adverse effects level (NOAEL) for a sensitive population in the Yang et al study (1989b) of 853 micrograms per day (µg/day), USEPA still applied a UF of 3 to further protect sensitive individuals to arrive at a daily intake of 284 µg/day. The IOM used the same study, Yang et al, (1989b), and identified an NOAEL daily intake of 800 µg/day and applied a UF of 2 to address sensitive individuals to arrive at a UL of 400 µg/day versus the daily intake of 2. Thus, the daily intake based on the RfD of 284 µg/day is lower but within the same order of magnitude as the UL of 400 µg/day.

The UL for children was based on a different epidemiologic study than that applied for the adult UL. For the child UL, IOM established a UL for a child (1-3 years) and a child (4-8 years) by using a study from Shearer and Hadjimarkos (1975), which showed that a human milk selenium concentration of 60 µg/L was not associated with known adverse effects. Thus, the NOAEL for this study of 7 micrograms per kilogram per day (µg/kg/day) was adjusted for older infants and children based on body weight to arrive at ULs of 90 µg/day and 150 µg/day for children of 1-3 years and children of 4-8 years, respectively. It should be noted that this represents the upper NOAEL identified in this study, a lowest observed adverse effects level (LOAEL) was not identified (Levander et al., 1987). This introduces the uncertainty that the actual health protective dose could be higher than the UL. Further, there is no known evidence indicating an age-related sensitivity to selenium toxicity (IOM, 2000).

Appendix M presents an additional evaluation of potential selenium intake for the hypothetical groundwater user. Table M-2 uses the EPC for selenium from each well where selenium was determined to be above the background UTL and multiplies it by the drinking water intake rate used in the GWRA (2 L/day for adult, 1 L/day for child) to estimate a selenium intake in mg/day for the hypothetical groundwater users: adult, child 1 to 3 years, and child 4 to 8 years. The hypothetical intake from groundwater is added to an estimated dietary intake for the receptor as a conservative evaluation of the total potential daily intake for a future resident who could be using the groundwater as a potable source of drinking water. This total estimated selenium intake was then compared to the UL for each receptor. The results of this comparison indicate that all groundwater intake is well below the UL. When estimated dietary intake is added to the estimated groundwater intake, the UL is exceeded for all three evaluated age groups for one well, TW-1, with the highest ratio being 2.5 for the child 1 to 3 years. The total intake is dominated by the dietary intake component.

The UL for the child receptors is based on the highest estimated exposure, which is a NOAEL. A LOAEL was not identified for this study. Consequently, the safe allowable daily intake may be above the UL. This

perspective is important because it is this uncertainty that indicates the exceedances of the UL for the child 1 to 3 yrs in wells MW-21 and MW-24A likely overestimate the potential health concern. In addition, as discussed above, there is no indication of an age-related sensitivity to selenium. For a risk management perspective, if the mean concentrations rather than the maximum detected concentration are used for the EPCs for wells MW-21 and MW-24A, the total estimated intake, including dietary intake for the child 1 to 3 years, drops below the UL. Estimated total dietary intake for TW-1 is still slightly above the UL for both child receptors. However, well TW-1 is located on the compressor station and will not likely be a location used for potable water.

7.4.2.4 Summary and Conclusions of Additional Selenium Evaluation

The results for this supplemental evaluation of essential nutrient status for selenium in TW-1 are comparable to the findings in the previous sections of the risk assessment. Accordingly, the weight of evidence presented in the risk assessment would support that selenium is not a COC and, thus, would not need to be carried forward to the CMS/FS.

As previously stated, although the weight of evidence presented in the risk assessment (including the supplemental essential nutrient evaluation) supports that selenium is unlikely to represent a significant source of noncancer hazard to future hypothetical groundwater users at the site, the RFI/RI concluded that selenium could potentially be related to releases from SWMU 1/AOC 1. Although the risk assessment concludes that selenium is not believed to be a source of significant risk/noncancer hazard and, thus, would not be considered a COC, because selenium exceeds an HI of 1.0 at one well, DTSC has directed PG&E to carry selenium forward into the CMS/FS.

7.5 Summary of Constituents of Concern

COCs are defined as those COPCs that are (1) determined to be present in site groundwater at levels of potential concern to future human health or the environment, and (2) likely associated with groundwater at SWMU 1/AOC 1 or SWMU 2. The COCs are recommended to be carried forward to the CMS/FS for risk management considerations.

Based on the results of the potential groundwater-to-surface water transport analysis presented in this GWRA, it is concluded that the potential transport of constituents in groundwater to the Colorado River represents an insignificant transport pathway: floodplain COPCs are not being transported to the Colorado River at concentrations that exceed screening-level surface water criteria. Accordingly, it may be concluded that quantitative surface water human health and ecological risk assessments are not warranted. Further, because there is no other significant ecological exposure pathway for contact with impacted site groundwater (e.g., potential phreatophyte exposure and subsequent ingestion by herbivorous mammals), there are no ecological receptors currently at risk of adverse effects due to the presence of COPCs in the groundwater.

As presented in this GWRA, there are a total of seven constituents that were detected in groundwater at concentrations that could pose a potential risk/hazard to future hypothetical groundwater users: fluoride, lead, molybdenum, and vanadium are estimated to be a low to moderate potential risk/hazard; arsenic and antimony are estimated to be a moderate potential risk/hazard; and hexavalent chromium is estimated to be a moderate to high potential risk/hazard. As stated in the RFI/RI Volume 2 (CH2M HILL, 2009a), the weight of the evidence supports that, of these seven constituents, only hexavalent chromium and, potentially, molybdenum are considered to be associated with groundwater at SWMU 1/AOC 1.

Additional detailed evaluations of molybdenum were conducted to more fully explore the uncertainties associated with the estimated noncancer hazards calculated for molybdenum and provide the risk managers with a more in depth evaluation of the weight of the evidence with respect to the presence and potential future health hazards associated with the molybdenum. This molybdenum essential nutrient evaluation, conducted in addition to the standard baseline evaluation, is not a typical component of DTSC's standard risk assessment protocols, although an essential nutrient screen is not an unusual request for USDOI sites. The USEPA senior toxicologist serving as the compound manager for molybdenum toxicity evaluations was consulted directly to determine the agency's view of using the IRIS RfDo for molybdenum versus the UL for hazard estimates. USEPA's advice was that the RfDo listed in IRIS is indeed flawed as indicated in the IOM document, and that the UL provides a better indication of potential health concerns for molybdenum hazard (Donohue, personal communication 2009). This USEPA-recommended approach (Donohue, personal communication 2009) of incorporating more recent toxicological information and USEPA metals risk assessment guidance (USEPA, 2007b) for integrating essential nutrient information into the risk assessment process indicates that there is only one well (1.2% of total wells) which slightly exceeds health protective criteria (exceeding by roughly 10%, which would equate to an "HI"-equivalent of 1.1). This supplemental evaluation of molybdenum presented in Appendix M assumes molybdenum intake from both groundwater and diet. These additional toxicological evaluations strongly suggest that molybdenum is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water.

In sum, based on the results of this GWRA analysis, and the identification of the COPCs associated with SWMU 1/AOC 1, as presented in the presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) and RFI/RI Volume 2 Addendum (CH2M HILL, 2009b), hexavalent chromium is the only COC. Accordingly, it is recommended that the COC hexavalent chromium be carried forward to the CMS/FS.

The three other COPCs identified in the RFI/RI Volume 2 and RFI/RI Volume 2 Addendum (CH2M HILL, 2009a,b) as potentially associated with SWMU 1/AOC 1, selenium, nitrate as nitrogen, and molybdenum, were thoroughly evaluated in this GWRA. As described in earlier sections, the weight of the evidence for these three compounds suggests that they would not be expected to pose significant noncancer hazard to future hypothetical groundwater users at the site, and thus would not be considered COCs. Although the risk assessment concludes that these three compounds are not believed to be a source of significant

risk/noncancer hazard and, thus, would not be considered COCs, because each exceeds an HI of 1.0 at one or more wells, DTSC has directed PG&E to carry selenium, nitrate as nitrogen, and molybdenum forward into the CMS/FS.

8. Risk-Based Remediation Goals/Applicable Drinking Water Criteria

This section presents a range of groundwater remediation goals for those constituents identified in the risk characterization section of the quantitative HHRA (see Section 7) as COCs with respect to future hypothetical residential groundwater use. COCs are those constituents that are: (1) determined to be present in site groundwater at levels of potential concern to future hypothetical residential groundwater users, and (2) likely associated with groundwater at SWMU 1/AOC 1 or SWMU 2. In accordance with RCRA/CERCLA risk assessment guidance, the COCs identified through the risk assessment process become the focus of remedial decision making and are incorporated into the upcoming CMS/FS. The range of remediation goals presented in this section may be considered and incorporated into the upcoming CMS/FS.

In accordance with the RAWP (ARCADIS, 2008), drinking water criteria, in compliance with chemical-specific applicable or relevant and appropriate requirements (ARARs), represent relevant remediation goals for COCs, where such criteria are available. Specifically, in accordance with the California Safe Drinking Water Act, California MCLs are to be identified as the chemical-specific ARARs for groundwater COCs (California Code of Regulations, Title 22, Division 4, Chapter 15). The drinking water criteria were presented in the RAWP (ARCADIS, 2008) in Table 5-1 (the California MCLs).

As stated by USEPA (1991), when ARARs do not exist (i.e., when MCLs do not exist for a COC in groundwater), risk-based remediation goals are calculated using USEPA health criteria (i.e., RfDs or CSFs) and default or site-specific exposure assumptions. Consistent with USEPA guidance, a risk-based process is used to estimate risk-based remediation goals for COCs in groundwater so that the risk-based remediation goals can be considered in the upcoming CMS/FS.

As discussed in Section 7.4, based on the results of the risk assessment, hexavalent chromium is the only COC [6]. Table 8-1 presents the range of remediation goals for hexavalent chromium that can be considered in the upcoming CMS/FS. Specifically, Table 8-1 presents the ARAR for hexavalent chromium (i.e., the California MCL of 50 µg/L for total chromium[17]), the calculated RBC (46 µg/L), and the background concentration for hexavalent chromium (32 µg/L). As discussed further in Appendix Q, the RBC for hexavalent chromium is calculated using the same exposure and toxicity assumptions as used in the estimation of risk, presented in Sections 5 through 7 of this GWRA.

[17] Although there is an MCL specific to hexavalent chromium, hexavalent chromium is regulated under the MCL for total chromium (i.e., 50 µg/L), which is considered safe for human consumption.

9. Uncertainties

This GWRA includes several uncertainties that warrant discussion. Many of the assumptions used in this GWRA regarding the COPC selection process, methods used to calculate EPCs, human exposures, and constituent toxicity are conservative, following agency guidance, and reflect a 90th or 95th percentile value, rather than an average value. The use of several conservative exposure and toxicity assumptions can introduce considerable uncertainty into the GWRA. By using conservative exposure or toxicity estimates, the assessment can develop a significant conservative bias that may result in the calculation of significantly higher cancer risks or noncancer hazards than are actually posed by the constituents present in groundwater. The most significant uncertainties in this evaluation are discussed below.

As discussed in previous sections, additional investigations are ongoing (e.g., East Ravine, AOC 4). If additional information is obtained during the upcoming investigations that suggests the impacts to groundwater are materially different in a manner not considered in this GWRA, a supplemental human health and ecological risk assessment may be warranted. The specific form of the supplemental risk assessment will be discussed with the agencies prior to the preparation of the document, but may be in the form of an Addendum, Technical Memorandum, or stand-alone document.

9.1 Data Evaluation

As discussed in the cover letter for the Background Study report (CH2M HILL, 2008a), the data collected for this study may be interpreted to represent two or more populations based on geochemical or geological distinctions. For example, the river-influenced fluvial material produces a naturally more reducing environment compared to the less reducing material, which may be alluvial or fluvial. This is described in detail in the RFI/RI Volume 2 (CH2M HILL, 2009a). Due to this and other geochemical distinctions, agencies have questioned whether the calculated background UTLs are appropriate for all constituents in all portions of the site or at all depths, and whether the background UTL of 31.8 µg/L for hexavalent chromium is applicable to all portions of the site. That is, there has been discussion that fluvial formation waters would have a lower naturally occurring concentration of hexavalent chromium, and that the use of a background dataset that is composed of groundwater from the range of formations across the site might not be fairly representative of individual formations.

In order to understand the implication of the use of the chromium background UTL on the GWRA, one must examine the various steps in the risk assessment process where the background UTL is used, and then explore how a different set of underlying assumptions might change the conclusions of the GWRA.

The first step in the risk assessment process where the background UTLs are used is the constituent selection step. That is, in order to identify all of the constituents, on a well-by-well basis, that are included in the quantitative evaluation of risk for that well, a comparison to the background concentrations is used.

Constituents with concentrations that are determined to be at or below the background concentrations, either based on a comparison of the maximum concentration to the UTL or based on a comparison of the entire well distribution to the background distribution, are eliminated from the quantitative risk assessment at that well. The critical question is, therefore, how the overall picture of risks at the site, associated with the presence of hexavalent chromium in groundwater, would change if additional wells with hexavalent chromium, specifically wells where hexavalent chromium had been excluded from the GWRA, were to be included in the quantitative evaluation.

Comparing the background concentration to the calculated RBC for hexavalent chromium provides a reasonable understanding of the influence of the specific background hexavalent chromium distribution on the estimates of risk. Using the exposure and toxicity assumptions relied upon in estimating the noncancer hazard posed by exposure to a given concentration of hexavalent chromium, one can calculate the concentration of hexavalent chromium that would correspond to a given "acceptable" level of risk (i.e., for noncarcinogenic effects, the target "acceptable" noncancer HI is 1.0). The RBC calculated using the exposure and toxicity assumptions presented in this GWRA for hexavalent chromium is 46 µg/L (as discussed in Appendix Q). This is very comparable to, and yet even more conservative than, the USEPA tap water RSL for hexavalent chromium of 110 µg/L (USEPA, 2008b). Given that the RBC for hexavalent chromium is actually greater than the background UTL of 31.8 µg/L, it may be concluded that the exclusion of hexavalent chromium detected in certain wells at concentrations that are even lower than the background UTL of 31.8 µg/L (i.e., under the assumption that the concern is that the background UTL might be too high) would not materially change the overall conclusions regarding the potential noncancer hazard associated with the presence of hexavalent chromium. This is because hexavalent chromium at concentrations less than 31.8 µg/L would correspond to noncancer hazards of less than the target level of 1.0.

9.2 Selection of Constituents of Potential Concern for Inclusion in the Quantitative Groundwater Risk Assessment

9.2.1 Uncertainty Associated with Background Comparisons: Impact on the Conclusions of the Risk Assessment when Determining if Constituents are Present at or Below Background Concentrations

There are two constituents at this site where the RBC is lower than the background UTL: arsenic and fluoride (RBCs are documented in Appendix Q). Because the RBCs for these compounds are lower than background UTLs, it is important to have an understanding of background for these constituents. Aside from arsenic and fluoride, constituents excluded at individual wells, based on a determination that the constituent is below background concentrations, are unlikely to be the COCs for health protection at this site because the background concentrations are below concentrations that would typically be considered to pose an unacceptable risk or hazard.

The GWRA takes a conservative approach in the constituent selection process. In situations where it is questionable whether the concentrations at a given well are at or below background, the GWRA errs on the conservative side and includes the constituent in the analysis as opposed to excluding it. As described in the RAWP (ARCADIS, 2008), if the maximum detected concentration at a well is below the UTL, the constituent is not included in the quantitative risk assessment. If the maximum detected concentration at a given well exceeds the UTL, additional detailed statistical evaluations are conducted looking at the datasets as a whole (i.e., the background dataset and the distribution at a given well – see Section 4.1). These more detailed statistical evaluations include tests of the median (Mann-Whitney or Gehan Test), in addition to tests of the upper tails (Quantile Test).

Out of 440 well/chemical pairs that had a maximum detection greater than the UTL, 192 (44 percent) well/chemical pairs were further analyzed by population tests. Only 19 (4.3%) well/chemical pairs were screened out of the risk assessment. Specifically, the 19 instances in which a given chemical at a given well is excluded from the assessment, based on the conclusion of the Mann Whitney and the Quantile Test, include the following: two for hexavalent chromium, one for copper, three for nitrate as nitrogen, one for selenium, seven for vanadium, and five for zinc. In order to further evaluate the significance of these exclusions on the risk assessment conclusions, the 19 well/chemical pairs that were screened out of the risk assessment because of the statistical population comparison tests were examined in further detail. Detailed statistical analyses conducted on 13 compounds, this translates into only about 9% of the analyses actually resulting in a decision to exclude the constituent from the quantitative risk analysis at that particular monitoring well. Summary statistics of these 19 instances, including number of detections, number of samples greater than the background UTL, and the 95% upper confidence limit (UCL) are all presented in the Table 9-1. Also attached, as Table 9-21a, are lists the results of each of the individual sampling events for these chemicals, to facilitate a more detailed evaluation of the data.

As indicated in Table 9-1, of the 19 well/chemical pairs screened out of the risk assessment, only four (0.9 percent) have a calculated 95%UCL above the associated background UTL. These four well/chemical pairs are hexavalent chromium in MW-23, vanadium in MW-34-80, vanadium in MW 37D, and zinc in OW-5M. Each of these four chemical/well pairs has a single distinct elevated concentration, with ratios of the highest to second highest observed concentration of 44, 16, 10, and 7.5, respectively. The 95%UCLs are dominated by the single elevated concentration. The outlier test using ProUCL was run for these four chemical/well pairs. In every case, ProUCL reports that the single elevated concentration is 99% likely to be an outlier.

The zinc outlier of 278 µg/L was “J” flagged as estimated because zinc was not detected in the associated field duplicate with an RL of 10 µg/L (see CH2M HILL, 2008e, Groundwater and Surface Water Monitoring Report, Fourth Quarter 2007). As indicated in the GWRA, all data containing “J” flags were included in the GWRA. We note that not only is zinc not a COPC associated with SWMU 1/AOC 1 or SWMU 2, the maximum detection of zinc, 0.278 mg/L, is more than an order of magnitude below the RBC of 4.7 mg/L (as

presented in Appendix Q). Accordingly, we do not believe that the one high hit detection of zinc, at this one well, affects any of the conclusions in the GWRA.

The RFI/RI Volume 2 (CH2M HILL, 2009a) discusses the high vanadium concentrations, and states that they are likely due to laboratory analytical issues. “Of the 14 [vanadium] samples in plume or plume flowpath wells that have exceeded UTL, ten were from a single sampling event in March 2005. Nine of these ten were reported as anomalous at the time (CH2M HILL, 2005e) and re sampling in June 2005 showed vanadium values back in normal range (below UTL), suggesting that laboratory analytical issues were the source of the elevated concentrations” (CH2M HILL, 2009a). Both outlier vanadium samples are from the single sampling event in March 2005 mentioned above. Accordingly, these two potential vanadium samples were not overlooked and were deliberately and conservatively included in the GWRA dataset because they were not rejected from the database during the data quality assessment process (which occurs per the approved QAPP). As vanadium is not a COPC that is associated with potential releases from SWMU 1/AOC 1 or SWMU 2, additional focus on these two particular wells was not deemed necessary or relevant to the overall conclusions of the GWRA or the CMS/FS.

As requested by USDOI, the temporal trends of vanadium in MW-34-80, vanadium in MW-37D and zinc in OW-5M were evaluated. There does not appear to be increasing concentrations over time in any of these chemical/well pairs.

In summary, based on this analysis, we believe that the approach used in the GWRA is sufficiently conservative, and has appropriately excluded wells based on a conservative comparison to background populations. The potential implication of incorrect decisions resulting from the detailed statistical evaluations (i.e., the combination of Mann Whitney and Quantile Test) on the projected numerical estimates of risk would, for the most part, not be expected to be substantial.

9.2.2 Impact of Multiple Comparisons on the Identification of Constituents to Include in the Quantitative Risk Assessment

As discussed in Section 4, where sufficient samples allow, statistical distributional tests (comparisons of means and medians) are often used to compare the concentrations of constituents detected to background concentrations. When these statistical tests indicate that the distribution of the constituent at a well is greater than the background distribution, the constituent is included as a COPC in the GWRA. As with all statistical tests, there are errors associated with the statistical decision process. The terms Type I error (also, α error, or false positive) and Type II error (β error, or a false negative) are used to describe these possible errors.

The Type I error is the error of incorrectly determining that a difference between the concentration measured in the well and the background concentration exists when, in fact, it doesn’t. The impact of Type I errors is including more constituents in the GWRA than may perhaps be necessary. The alpha level that is most

traditionally used in statistical hypothesis tests is 0.05; this is the Type I error rate used in this GWRA. An alpha level of 0.05 means that in no more than one in twenty statistical tests will the test indicate that there is a difference between the two populations (i.e., site versus background concentrations at a given well), when in fact there isn't. As mentioned in the RAWP (ARCADIS, 2008), when multiple simultaneous comparisons are occurring, the overall comparison-wise error rate has the potential to increase above the 0.05 level. As an example, in five comparisons, the chance of finding at least one difference in the population due to chance alone increases from one in 20 to one in five. Statisticians have developed a method to control the overall comparison-wise error rate, referred to as the Bonferroni adjustment. Using the Bonferroni method, the alpha level of each individual test is adjusted downwards to ensure that the overall site-wise error rate remains at 0.05 (or less).

For this GWRA, the Bonferonni correction is not applied to the statistical analyses. This decision is based primarily on a desire to err on the conservative side, and include constituents in the risk assessment process as opposed to excluding them. One important factor in applying the Bonferroni adjustment is that reducing the Type I error rate (i.e., reducing, on an individual test basis, the potential for concluding a difference between the populations exists, when in fact it doesn't) has the simultaneous impact of increasing the chance of making a Type II error (concluding that no difference exists when in fact it does). Given these tradeoffs, the approach in this GWRA is to make no corrections to the individual test alpha values. The overall impact of this approach is that this GWRA potentially includes compounds in the risk evaluation that may, at a particular well, be consistent with background concentrations.

9.2.3 Impact of Elevated Detection Limits on the Identification of Constituents to Include in the Quantitative Risk Assessment

Section 3.3.3.1 identifies and discusses the percentage of non-detect samples for each constituent in which the analytical detection limit exceeded the background UTL. As constituents that are determined to be present at or below background concentrations are excluded from the quantitative risk assessment, it is important to understand how sensitive the analytical detection limits are in comparison to the background dataset.

As discussed in Section 3.3.3.1 and as presented in Table 3-9, there are eight constituents for which more than 50% of the samples reported as non-detect contain detection limits that exceed the UTL. These constituents are: antimony, barium, beryllium, cobalt, lead, nickel, silver, and thallium. As discussed in Section 3.3.3.1, these constituents were all reported as non-detect in greater than 50% of the total samples.

In order to understand whether the detection limits may lead to a non-conservative decision to exclude a constituent from the GWRA, all samples for which the maximum detected concentration is lower than the UTL, and where the UTL is, in turn, lower than the maximum reported detection limit, have been identified. As discussed in Section 4, if the maximum detected concentration for a constituent at a given well is below

the calculated UTL, the constituent is excluded from the quantitative risk evaluation at that well. Accordingly, it is necessary to understand the overall frequency in which the maximum detected concentration is lower than the UTL (which would lead to a decision to exclude the chemical), but also where the analytical detection limit is higher than both the maximum detection limit and the background UTL.

Table 9-3 identifies, for each chemical, the number of samples and number of wells where elevated detection limits, as described above, could lead to an incorrect conclusion to exclude the constituent from the quantitative risk assessment. This test is referred to in Table 9-3 as "Criterion 1." As indicated, this occurs for a total of six different constituents: arsenic, barium, copper, lead, molybdenum, and nickel. However, the frequency with which this occurs across the site is greater than 5% for only two constituents: barium (37%) and nickel (20%). Accordingly, there are two constituents, barium and nickel, where elevated detection limits could potentially lead to a non-conservative decision to exclude the constituent from the GWRA, potentially leading to an underestimation of risks for these constituents at various wells.

In order to more fully understand the extent to which the exclusion of barium and nickel from the GWRA, based on elevated detection limits, may materially underestimate risk and/or hazard, it is necessary to understand whether any of the detection limits for the situations described above (i.e., where the maximum detected concentration below the UTL, but analytical detection limit greater than the UTL) are actually greater than RBCs. This test is referred to in Table 9-3 as "Criterion 2." As indicated in Table 9-3, the analytical detection limits for barium and nickel for those situations where the constituent could be incorrectly excluded from the GWRA based on elevated detection limits are below RBCs. Accordingly, the exclusion of barium and nickel from the GWRA at particular wells, based on a maximum detection limit that exceeds the UTL, does not result in a material underestimation of risk and/or hazard.

9.3 Evaluation of the Groundwater-to-Surface Water Transport Pathway

Section 4.2 describes the steps used to evaluate the significance of the groundwater-to-surface water transport pathway. As described, the first step involves identifying whether any COPCs in the floodplain wells are present at concentrations greater than the surface water criteria. For constituents present in the floodplain groundwater wells at concentrations greater than surface water criteria, the next step is to compare the actual concentrations measured in the surface water to surface water criteria. The impact of analytical detection limits to potentially lead to a non-conservative decision (e.g., a determination that the constituent is present in the floodplain wells at concentrations below applicable surface water criteria) is discussed in this section.

As described in Section 4.2, if constituents are detected in floodplain wells at concentrations below their applicable surface water criteria, they are eliminated from further evaluation. The rationale behind this approach, as discussed in the RAWP (ARCADIS, 2008), is that if the constituent is below surface water criteria in the floodplain groundwater, transport from the groundwater and subsequent release to the river

could not result in surface water concentrations that are greater than the surface water criteria. Accordingly, it is important to confirm that the analytical detection limits for the constituents in the floodplain wells are below the applicable surface water criteria.

As described in Section 4.2, the significance of the groundwater-to-surface water transport pathway is evaluated by comparison of the 95% UCL OTM concentrations of the constituents in floodplain groundwater to the applicable surface water criteria. In general, elevated detection limits could result in a potential overestimate of the 95% UCL OTM, which could result in a decision that a particular constituent is present in the floodplain groundwater at concentrations that are higher than surface water criteria. However, if there are not enough samples to calculate a 95% UCL OTM, the representative EPC of the constituent in floodplain groundwater is based on the maximum detected concentration. If the maximum detected concentration is used as the EPC, and the maximum detected concentration is lower than both the highest detection limit and the applicable surface water criterion, it is possible to reach an erroneous (and non-conservative) conclusion that the constituent is present in the floodplain at concentrations below a level of concern (and would, therefore, not be considered further in the groundwater-to-surface water transport pathway analysis).

In order to understand whether elevated detection limits could lead to underestimation of the potential significance of the groundwater-to-surface water transport pathway, all constituents with an EPC in floodplain groundwater based on the maximum detected concentration have been identified. There are four constituents for which the maximum concentration detected across the floodplain area is used as the representative EPC: aluminum, beryllium, mercury, and silver. As indicated in Table 9-4, three of these constituents – beryllium, mercury, and silver – are carried through to the next step in the pathway analysis (i.e., comparison of concentrations in downstream surface water to surface water criteria), because the maximum detected concentrations of these constituents in the floodplain area exceed their applicable surface water criteria. For aluminum, the maximum analytical detection limit in the floodplain area is 0.5 mg/L, a level which is below the applicable surface water criterion. Therefore, the elimination of aluminum from the next step of the pathway analysis is arguably the correct decision. It may be concluded that detection limits for constituents in the floodplain wells are sufficient for assessing the potential significance of the groundwater-to-surface water transport pathway.

Constituents that are present in the floodplain area above applicable surface water criteria are evaluated further by comparing the actual measured concentrations in downstream surface water to applicable surface water criteria. Similar to the analysis of groundwater data, it is necessary to understand whether elevated detection limits for the surface water samples could lead to an incorrect determination that the constituent is not present in downstream surface water at a level of concern. There are two constituents for which the maximum detected concentration in downstream surface water is used as the representative EPC: hexavalent chromium and vanadium. (As discussed in Section 3.2.1.4, the one detection of hexavalent chromium in downstream surface water is believed to be associated with the presence of hexavalent chromium in the laboratory buffer solution.) As indicated in Table 9-5, for hexavalent chromium, the

maximum analytical detection limit in the surface water is still below the applicable surface water criterion. Therefore, the conclusion that transport of hexavalent chromium from groundwater to surface water does not appear to be a significant transport pathway is supportable. For vanadium, the maximum detected concentration is greater than both the maximum analytical detection limit and the surface water criterion. Therefore, vanadium is analyzed further in the groundwater-to-surface water transport pathway.

It may be concluded that detection limits for constituents in the floodplain groundwater and in the surface water are sufficient for assessing the potential significance of the groundwater-to-surface water transport pathway.

9.4 Exposure Assessment

9.4.1 Exposure Scenario

As described in this GWRA, numerous assumptions must be made in order to estimate human exposure to the COPCs detected in groundwater at the site. Consistent with the assumptions set forth in the RAWP (ARCADIS, 2008), this GWRA assumes that the "future hypothetical residential groundwater users" will use an onsite groundwater well for supplying all domestic water and will use this groundwater daily for an entire 30-year period. This future exposure scenario is unrealistic and results in a characterization of future hypothetical risk that is unrelated to any likely future exposure conditions. There is no one currently using the groundwater, and any future hypothetical use of the groundwater would not occur until the remedy is complete and all remedial goals have been achieved. Further, current (i.e., non-residential) land uses at the site are likely to remain the same in the future. PG&E plans to continue owning and operating the site and associated property as an industrial operation for the foreseeable future. The railroad and highway will also continue in their current use for the foreseeable future. Accordingly, the reasonably anticipated future use of these areas is the same as their current use, industrial operations. The primary conservation mission of USFWS, as it applies to the HNWR, limits human use of HNWR property, In the future, human use of HNWR property will continue to be restricted to recreational uses. Similarly, future use of the USBLM-owned land at the site is likely to remain recreational, although USDOI has indicated that residential use of that property cannot be precluded. Accordingly, assumptions made in this document that the groundwater could be used for domestic purposes in a residential setting, with exposures occurring for a 30 year period are overly conservative, and not representative of likely future exposure conditions.

In sum, risks presented in this document should not be construed or misinterpreted to have any relationship to actual current or potential future risks posed by the conditions at the site. The risk estimates are used solely for risk management and remedial planning purposes. As there are no current or expected future exposures to the groundwater, the conditions in the groundwater pose no risks to populations at or around the site.

9.4.2 Calculation of Representative Exposure Point Concentrations

9.4.2.1 Impact of Elevated Detection Limits on Representative Exposure Point Concentrations

In general, for those constituents where there are sufficient samples to calculate a statistically relevant EPC (i.e., a 95% UCL OTM), the impact of elevated detection limits on the overall risk assessment process is that EPCs, and thus risks and/or noncancer hazards, are likely to be overestimated. This is because higher detection limits tend to bias the 95% UCL OTM calculation on the high side. Accordingly, for those constituents that are included in the quantitative risk assessment, and for which the EPC is estimated using the 95% UCL, it may be concluded that the impact of elevated detection limits is to potentially increase the representative EPC; thereby, potentially overestimating the risk and noncancer hazard associated with the presence of the chemical.

The potential to overestimate 95% UCLs OTM based on elevated detection limits is quantitatively evaluated in Appendix P by counting the number of non-detects with detection limits above the RBC. The more non-detects above the RBC, the more likely the 95% UCL OTM based on these non-detects is overestimated. As shown in Table P-1, when the 95% UCL is the representative EPC, there are only two constituents at two wells in which the detection limits are above the RBC: nickel at MW-30-30 and fluoride at CW-2D. For nickel, only one detection limit is above the RBC out of 15 non-detect results. For fluoride, only one detection limit is above the RBC out of seven non-detect results. With such a limited number and frequency of detection limits exceeding the RBC, it is highly unlikely that elevated detection limits have resulted in overestimation of potential noncancer hazard. Note that for thallium, elevated detection limits do have a significant effect on the sensitivity analysis as summarized in Table P-1; elevated detection limits for thallium cause the average noncancer hazard (as presented in the Sensitivity Analysis – Appendix G) to be higher than the maximum noncancer hazard.

Elevated detection limits can result in a potential underestimation of risk when the EPC is based on the maximum detected concentrations, and where the maximum detected concentration is lower than maximum detection limit. Presented in Table 9-6 for each constituent included in the quantitative risk assessment is a comparison of detection limits to maximum detected concentrations and to RBCs at those wells where the constituent EPC is based on the maximum detected concentration. This table provides information regarding the extent to which actual risks potentially may be underestimated due to elevated detection limits. Specifically, if the maximum detected concentration is used as the EPC at a particular well, but that maximum detected concentration is below the maximum analytical detection limit of the samples collected at the well, it is possible that risks and hazards could be underestimated at the particular well. In such cases, there could have been concentrations present in that well above the detected maximum, but they were not detected due to elevated detection limits. As indicated in Table 9-6, however, there are few instances where such an underestimate of risk and hazard is potentially significant. Cobalt and thallium are the only two constituents where elevated detection limits could potentially result in an appreciable underestimate of

noncancer hazard. As these constituents are so infrequently detected across the site as a whole, even if the risks are somewhat underestimated at these limited locations, it is unlikely that the overall conclusions regarding the risks posed by these constituents would change.

9.4.2.2 Use of Individual Monitoring Wells as Future Representative Exposure Concentrations

The GWRA assumes that water quality data from an individual groundwater monitoring or testing well is representative of water quality from a future water supply well. Monitoring wells are typically small-diameter wells with relative short screens, with screen locations biased towards the zones of highest contamination in the aquifer. Water supply wells are often screened across expanded aquifer thicknesses to optimize capacity and are constructed of sufficient diameter to house continuous supply pumping equipment. In sum, the fact that future human exposures are represented by constituent concentrations measured at an individual monitoring well, without accounting for either vertical or horizontal mixing that is likely to occur as water is pulled into the wells for supply needs, likely results in an overestimate of potential future exposure concentrations. Impact of Operation of Interim Measure Groundwater Extraction Plant on Representative Exposure Point Concentrations

Representative EPCs are calculated for constituents using the results of all validated sampling data, as presented in the RFI/RI Volume 2 (CH2M HILL, 2009a) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2009b)[2]. The purpose of this discussion is to provide context as to the extent and significance of the IM groundwater extraction on the representative EPCs that are used to characterize exposures and future hypothetical risks.

As described in the RFI/RI Volume 2 (CH2M HILL, 2009a), under ambient conditions, the river recharges groundwater during the spring months and groundwater discharges to the river during the months of lower river stages. The IM, in operation since 2004, consists of groundwater extraction for hydraulic control of the groundwater plume in the Colorado River floodplain and management of extracted groundwater. Operation of the current groundwater treatment and injection system (IM No. 3) began in July 2005. The purpose of the IM is to maintain hydraulic control of the groundwater plume boundaries until the time that a final corrective action is in place at the site. As defined by DTSC, the performance standard for IM No. 3 is to “establish and maintain a net landward hydraulic gradient, both horizontally and vertically, that ensures that hexavalent chromium concentrations at or greater than 20 µg/L in the floodplain are contained for removal and treatment.” Consistent with this performance standard, the IM groundwater extraction has maintained a consistent landward gradient in the plume floodplain area year round.

In general, the effects of the IM groundwater extraction are observed in the wells near the river, east of the extraction system, and wells around the pumping system. The hexavalent chromium concentration graphs for monitoring locations near the pumping wells (MW 39, MW 30, and MW 36) show pronounced declining trends reflecting the influence of the groundwater extraction system (CH2M HILL, 2009a). The sampling data

since July 2006 show gradual declining concentration trends for MW 34 100 and MW 44 115 (deep-zone wells in the eastern edge of the floodplain; see Figure 6 9c in the RFI/RI Volume 2). For these five wells near the river, the hexavalent chromium concentrations reported since implementation of IM groundwater extraction have decreased, resulting in estimated hexavalent chromium EPCs at these wells that are likely lower than would have been estimated using only pre-IM data.

Trends around the pumping system have also changed since the operation of the IM system. In the sampling data that predate the March 2004 startup of IM groundwater extraction, hexavalent chromium concentrations were generally stable in the deep zone well (MW 20 130), whereas a seasonally fluctuating trend was observed in the shallow zone well (MW 20 70). From March 8 to May 13, 2004, the MW 20 cluster wells were pumped for the initial IM groundwater extraction as part of the IM No. 2 activity. Groundwater extraction on the MW 20 bench has been continuous since May 2004, using primarily well TW 2D (through January 2006) and well TW 3D (December 2005 to present). During full-time groundwater extraction, the hexavalent chromium concentrations in the MW 20 wells show pronounced increasing concentrations in the mid-depth and deep wells and declining concentrations in the shallow water table monitoring well MW 20 70. These trends, all documented and discussed in the RFI/RI Volume 2 (CH2M HILL, 2009a), reflect the pumping influence of the IM extraction system.

The influence of the IM groundwater extraction system has been to reduce hexavalent chromium concentrations in approximately five wells close to the river, reduce concentrations in the shallow zone directly around the pumping system, and increase concentrations in the deeper zones around the extraction system. The wells that are materially influenced by the operation of the IM groundwater extraction system are known and limited in number, and the impact of the IM system has been monitored since 2004 and is fully discussed in the RFI/RI Volume 2 (CH2M HILL, 2009a). Given these known documented facts and influences, it does not appear that the impacts of the ongoing IM groundwater extraction system on the estimation of EPCs, as developed in this GWRA, would materially alter the determination of the COPCs that need to get carried forward to the CMS/FS, or the ability to define the area where remedial action may be warranted.

9.5 Toxicity Assessment

Uncertainty in the toxicity assessment arises for those constituents that rely on animal studies as the basis for determining the appropriate toxicity value. Typically, the toxicity values recommended by CalEPA and USEPA and used in risk assessments assume that adverse effects observed in animal toxicity experiments would also be observed in humans (animal-to-human extrapolation). Further, absent specific information to the contrary, the toxicity values recommended for use by CalEPA and USEPA typically assume that the toxic effect observed after exposure by one route would occur following exposure by a different route (route-to-route extrapolation). Both of these assumptions introduce uncertainty into the GWRA.

In order to adjust for uncertainties that arise from the use of animal data, regulatory agencies often base the RfD for noncarcinogenic effects on the most sensitive animal species (i.e., the species that experiences adverse effects at the lowest dose) and adjust the dose via the use of safety or UFs. The adjustment compensates for the lack of knowledge regarding interspecies extrapolation and the possibility that humans are more sensitive than the most sensitive experimental animal species tested. The use of UFs is generally considered to be health protective.

Second, when route-specific toxicity data are unavailable, data are derived by route-to-route extrapolation, and equal absorption rates for both routes are assumed (e.g., oral to inhalation). This may or may not reflect the actual differences in toxicity that can be associated with the route of exposure, but is generally considered to be a conservative and health protective assumption.

Substantial uncertainty regarding the RfD for molybdenum was identified during the course of this GWRA, indicating that it is overly conservative when considering more current information than is included in the IRIS profile (IOM, 2001). Those uncertainties and their potential impacts on the hazard estimates for molybdenum are addressed in detail in Appendix M and summarized in Section 7.4.

Of significance in this GWRA is the uncertainty associated with oral exposure to hexavalent chromium. Under the current regulatory regime, oral exposure to hexavalent chromium is not regulated as a carcinogen. Accordingly, in this GWRA, hexavalent chromium is evaluated based on its potential to cause noncancer effects when ingested. However, CalEPA OEHHA is currently reviewing recent toxicological studies conducted with mice and rats, which suggest that oral exposure to hexavalent chromium could cause intestinal tumors in mice. OEHHA has indicated that it intends to publish a drinking water Public Health Goal that incorporates the assumption that oral exposure to hexavalent chromium could cause cancer.

If hexavalent chromium were to be regulated as an oral carcinogen, it is likely that risks presented in this GWRA could be underestimated. As presented in Appendix Q, the RBC for hexavalent chromium, under the assumption that oral exposure to hexavalent chromium causes noncancer effects but does not cause cancer, is 0.046 mg/L. This RBC is only slightly greater than the background concentration of hexavalent chromium of 0.032 mg/L. Thus, although risks presented in this GWRA could be underestimated if, in the future, hexavalent chromium is regulated as an oral carcinogen, such a determination is unlikely to impact the identification of areas across the site that require remediation. As with compounds like arsenic, where naturally occurring background concentrations are often greater than concentrations corresponding to a 1×10-6 incremental risk level, agencies typically require remediation to the higher of either background or RBC (i.e., it is infeasible and impractical to expect cleanup to levels below naturally occurring background concentrations). Therefore, although calculated cancer risks could be underestimated if hexavalent chromium is determined to be an oral carcinogen, it is important to note that any such future determination would not alter a remedial plan that is focused on reducing hexavalent chromium concentrations in the groundwater to levels consistent with naturally occurring background.

9.6 Cumulative Risks and Upcoming Soil Investigations

As described above, the purpose of this GWRA is to provide information about potential human health threats and ecological risks posed by groundwater impacted by chemical releases from SWMU 1/AOC 1 and SWMU 2 and to assist risk management decision making. The upcoming CMS/FS will identify the proposed measures to be used to remediate the groundwater. As indicated in Figure 1-4, soil investigations are underway and will be presented in the RFI/RI Volume 3. Following the completion of the Soils Risk Assessment, a CMS/FS specifically for soils will be developed, and the recommended soils remediation activities (if any) will be implemented. The GWRA proceeded in advance of the Soils Risk Assessment, at the request of DTSC, to expedite the preparation of the CMS/FS for the groundwater impacts associated with SWMU 1/AOC 1. The overarching goal was to move forward with the selection of a remedy for the known significant groundwater impacts, while continuing the characterization efforts for the soil.

The remedial goals for the groundwater will be selected prior to the development of the Soils Risk Assessment. Consequently, there is uncertainty, at this juncture, as to what the cumulative hypothetical future risks may be to individuals when accounting for exposures to both groundwater and soil. Nonetheless, the impact and magnitude of this uncertainty with respect to cumulative risks can only be understood, evaluated, and addressed at the time when the Soils Risk Assessment and Soils CMS/FS are being completed. As discussed with the agencies, the approach of moving forward with a groundwater remedy while information about soil impacts are still being collected is a common approach used in regulatory remedial investigations and remedy selection programs and does not jeopardize the overall protectiveness of the groundwater remedy. The potential for material cumulative impacts associated with the presence of chemicals in both the groundwater and the soil will be discussed in the upcoming Soils Risk Assessment and accounted for in the upcoming soils remedy selection process, if appropriate and necessary.

10. Conclusions and Recommendations

A comprehensive groundwater risk assessment was conducted, in accordance with the agency-approved RAWP and RAWP Addendum (ARCADIS, 2008; 2009), in order to provide information about potential health threats and ecological risks posed by groundwater impacted by chemical releases from SWMU 1/AOC 1 and SWMU 2 and to assist risk management decision making (USEPA, 1989; USEPA, 1997a). The GWRA combines the quantitative estimates of risk with the findings of the RFI/RI Volume 2 and RFI/RI Volume 2 Addendum (CH2M HILL, 2009a,b) and recommends a final list of compounds, referred to as COCs, to be carried forward to the CMS/FS. Specifically, COCs are defined as those COPCs that are (1) determined to be present in site groundwater at levels of potential concern to future human health or the environment, and (2) likely associated with groundwater at SWMU 1/AOC 1 or SWMU 2. The COCs represent those constituents that are recommended to be carried forward to the CMS/FS for risk management considerations.

The key conclusions and recommendations of the GWRA were conservatively based on estimates of potential future risk/noncancer hazard at each individual monitoring well and are summarized as follows:

- The potential transport of constituents in groundwater to the Colorado River represents an insignificant transport pathway: floodplain COPCs are not being transported to the Colorado River at concentrations that exceed screening-level surface water criteria. Accordingly, it may be concluded that quantitative surface water human health and ecological risk assessments for this pathway are not warranted.

- Because there is no current direct or indirect complete exposure pathway for contact with impacted site groundwater, there is no human population currently at risk of adverse health effects due to the presence of hexavalent chromium in the groundwater.

- Because there is no significant ecological exposure pathway for contact with impacted site groundwater, there are no ecological receptors currently at risk of adverse effects due to the presence of COPCs in the groundwater.

- The following COPCs are either consistently detected at individual wells below target risk thresholds, or were detected infrequently at concentrations at individual wells only slightly above a target risk threshold: aluminum, barium, beryllium, cadmium, cobalt, copper, mercury, nickel, nitrate as nitrogen, selenium, silver, thallium, and zinc. Accordingly, as these compounds do not represent significant sources of potential future risk/noncancer hazard, the risk assessment would support that these constituents are not COCs and, thus, it is recommended that these constituents not be carried forward to the CMS/FS.

- There are a total of seven COPCs that were detected in groundwater at concentrations that were calculated to potentially pose a risk/hazard to future hypothetical groundwater users:

  - Fluoride, lead, molybdenum, and vanadium are estimated to be a low to moderate potential risk/hazard.
  - Arsenic and antimony are estimated to be a moderate potential risk/hazard.
  - Hexavalent chromium is estimated to be a moderate to high potential risk/hazard.

- As detailed in the RFI/RI Volume 2 (CH2M HILL, 2009a), the weight of the evidence supports that, of these seven constituents that could potentially pose a risk/hazard to future hypothetical groundwater users, only hexavalent chromium and, potentially, molybdenum are considered to be associated with SWMU 1/AOC 1.

- The RFI/RI Volume 2 (CH2M HILL, 2009a) states that the presence of fluoride, lead, vanadium, antimony, and arsenic does not coincide with historical discharges to the BCW or the inactive injection well PGE-8. The RFI/RI Volume 2 concludes that local variability of naturally occurring groundwater in the basin or localized anomalous detections as the explanations for the presence of these constituents in groundwater (CH2M HILL, 2009a). Accordingly, these constituents are not COCs and, thus, it is recommended that the following COPCs not be carried forward to the CMS/FS: fluoride, lead, vanadium, antimony, and arsenic.

- Additional detailed evaluations of molybdenum were conducted to more fully explore the uncertainties associated with the estimated noncancer hazards calculated for molybdenum, and provide the risk managers with a more in-depth evaluation of the weight of the evidence with respect to the presence and potential future health hazards associated with the molybdenum. Incorporating more recent toxicological information and agency-recommended approaches for integrating essential nutrient information into the risk assessment process (USEPA, 2007b) suggests that that molybdenum is unlikely to pose adverse health effects to future hypothetical receptors that may use site groundwater as a potable source of water. Accordingly, the results of the risk assessment would support that molybdenum is not a COC and, thus, it is recommended that molybdenum not be carried forward to the CMS/FS.

- Hexavalent chromium is present at concentrations that could pose a potential hazard to the future hypothetical groundwater user, if the groundwater were in the future to be used as a potable source of water. Based the on the results of the risk estimates, and the fact that the presence of hexavalent chromium is related to historical releases from SWMU 1/AOC 1, hexavalent chromium is the only COC. Accordingly, it is recommended that the COC, hexavalent chromium, be carried forward to the CMS/FS.

- In addition to hexavalent chromium, the RFI/RI Volume 2 and Volume 2 Addendum identified three other COPCs as potentially associated with SWMU 1/AOC 1: selenium, nitrate as nitrogen, and molybdenum. Selenium, nitrate as nitrogen, and molybdenum were thoroughly evaluated in this GWRA. As described in earlier sections, the weight of the evidence for these three compounds suggests that they would not be expected to pose a significant risk/noncancer hazard to future hypothetical groundwater users at the site. Although the risk assessment concludes that these three compounds are not believed to be a

source of significant risk/noncancer hazard and, thus, would not be considered COCs, because each exceeds an HI of 1.0 at one or more wells, DTSC has directed PG&E to carry selenium, nitrate as nitrogen, and molybdenum forward into the CMS/FS.

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ARCADIS

Tables

Table 2-1
Representative Upland Animal Species

Common Name	Scientific Name	Conservation Status	Habitat	Feeding Guild	Confirmed Present	Potentially Present	Comments
Birds							
Bald eagle	*Haliaeetus leucocephalus*	State endangered	Large trees and/or cliffs	Raptor	No	No	
Brewer's blackbird	*Euphagus cyanocephalus*	No status	Open trees and shrubs	Insectivore, herbivore	Yes	Yes	
Cactus wren	*Campylorhyncus brunneicapillus*	No status	Desert succulent shrub, desert wash, and Joshua tree habitats	Invertivore, frugivore	Yes	Yes	Included in Havasu species list; uncommon.
California condor	*Gymnogyps californianus*	State and federally endangered	High desert canyon lands and plateau; caves, ledges, or large trees necessary for nesting; high perches necessary for roosting	Carnivore; carrion	No	No	No suitable habitat. Site is not within reintroduction areas.
Canyon wren	*Catherpes mexicanus*	No status	Canyons and cliffs	Insectivore	Yes	Yes	
Common raven	*Corvus corax*	No status	Open terrain with cliffs	Omnivore	Yes	Yes	
Gambel's quail	*Callipepla gambelii*	No status	Desert habitats	Herbivore	Yes	Yes	Common and nesting in Havasu.
Greater roadrunner	*Geococcyx californianus*	No status	Trees and arid open land	Carnivore	Yes	Yes	Common and nesting in Havasu.
Mourning dove	*Zenaida macroura*	No status	Open woodland or desert	Herbivore	Yes	Yes	Common and nesting in Havasu.
Red-tailed hawk	*Buteo jamencensis*	No status	Adaptable	Carnivore	Yes	Yes	Common and nesting in Havasu.
Rock dove	*Clumba livia*	No status	Urban areas, adaptable	Omnivore	No	No	
Turkey vulture	*Cathartes aura*	No status	Open with large tree and cliffs	Carnivore; carrion	Yes	Yes	
Reptiles							
California kingsnake	*Lampropeltis getulus california*	No status	All habitats except mountain	Carnivore	Yes	Yes	Included in Havasu species list.
Chuckwalla	*Sauromalus obesus*	No status	Rocky outcrops and rocky hillsides	Herbivore	Yes	Yes	Included in Havasu species list.
Coachwhip	*Masticophis flagellum*	No status	Wide range of habitats: desert, prairie, scrubland, juniper-grassland, woodland, thornforest, farmland, creek valleys, and swamps; usually in dry open terrain	Carnivore	Yes	Yes	
Desert horned lizard	*Phynosoma platyrhinos*	No status	All desert scrub types and grass/forb stages of pine/juniper woodlands	Invertivore, herbivore	Yes	Yes	Included in Havasu species list.
Desert iguana	*Dipsosaurus dorsalis*	No status	Creosote scrub, sandy creosote flats	Herbivore	Yes	Yes	
Desert tortoise	*Gopherus agassizii*	State and federally threatened	Mohave Desert scrub	Herbivore	No	No	No suitable habitat or foraging vegetation (PG&E, 2006).

Table 2-1
Representative Upland Animal Species

Common Name	Scientific Name	Conservation Status	Habitat	Feeding Guild	Confirmed Present	Potentially Present	Comments
Ground snake	*Sonora semiannulata*	No status	Hillsides or flats with or without rocks, usually where there is fine wind-blown sand	Invertivore	Yes	Yes	Included in Havasu species list.
Mohave rattlesnake	*Crotalus scutulatus*	No status	Desert, grassland/herbaceous, shrubland/chaparral, woodland/conifer, woodland/hardwood, woodland/mixed	Carnivore	No	No	
Pine-gopher snake	*Pituophis melanoleucus*	No status	All habitats; absent from densely forested areas	Carnivore	Yes	Yes	Included in Havasu species list.
Side-blotched lizard	*Uta stansburiana*	No status	Desert scrub, desert wash, creosote	Invertivore	Yes	Yes	Included in Havasu species list.
Sidewinder	*Crotalus cerastes*	No status	Wide variety of habitats most frequently desert washes and flats with scrub cover and windblown sand	Carnivore	Yes	Yes	Included in Havasu species list.
Speckled rattlesnake	*Crotalus mitchellii*	No status	Rocky areas and slopes in desert and chaparral habitats; occasionally in pine-juniper and woodland habitat	Carnivore	Yes	Yes	Included in Havasu species list.
Spotted leaf-nosed snake	*Phyllorynchus decurtatus*	No status	Rocky and sandy flats and slopes to 3000 feet; most abundant in areas of mixed sandy and rocky soil with some brush cover	Carnivore	Yes	Yes	Included in Havasu species list.
Western blind snake	*Leptotyphlops humilis*	No status	Wide variety of habitats at low elevations	Insectivore	Yes	Yes	Included in Havasu species list.
Western diamondback rattlesnake	*Crotalus atrox*	No status	Flats and foothills, prefers brushy areas, riparian habitats	Carnivore	Yes	Yes	
Western long-nosed snake	*Rhinocheilus lecontei lecontei*	No status	Grasslands, arid brushlands	Carnivore	Yes	Yes	Included in Havasu species list.
Western whiptail lizard	*Cnemidorphorus tigris*	No status	Valley foothills (hardwoods, mixed conifer, pine-juniper)	Invertivore	Yes	Yes	
Zebra-tailed lizard	*Callisaurus draconoides*	No status	Sandy and gravelly desert flats, creosote scrub	Invertivore	Yes	Yes	
Mammals							
American badger	*Taxidea taxus*	No status	Drier open stages of most shrub, forest, and herbacious habitat	Carnivore	Yes	Yes	
Black-tailed hare	*Lepus californicus*	No status	Cropland/hedgerow, desert, grassland/herbaceous, savanna	Herbivore	Yes	Yes	
Bobcat	*Lynx rufus*	No status	Brushy stages of low/mid elevation conifer, oak, riparian	Carnivore	Yes	Yes	
California ground squirrel	*Spermophilus beecheyi*	No status	Found in a wide variety of habitats; usually in open areas in many plant communities	Herbivore	No	No	
California myotis	*Myotis californicus*	No status	Desert, chaparral, woodland, and forest from sea level up to ponderosa pine, mixed conifer, and Jeffery pine	Invertivore	Yes	Yes	Included in Havasu species list.

Table 2-1
Representative Upland Animal Species

Common Name	Scientific Name	Conservation Status	Habitat	Feeding Guild	Confirmed Present	Potentially Present	Comments
Cave myotis	*Myotis velifer*	CSC; no federal status	Desert scrub, desert wash, desert succulent scrub, and desert riparian	Insectivore	Yes	Yes	Included in Havasu species list.
Coyote	*Canis latrans*	No status	Open brush, scrub, herbaceous habitats	Carnivore	Yes	Yes	
Deer mouse	*Peromyscus maniculatus*	No status	All habitats	Herbivore, invertivore	Yes	Yes	
Desert cottontail	*Sylvilagus audubonii*	No status	Grasslands, open forests, desert shrub	Herbivore, granivore	Yes	Yes	
Desert kit fox	*Vulpes macrotis*	State status: protected furbearing mammal	Annual grasslands or grassy open stages of vegetation w/scattered brush	Carnivore	Yes	Yes	
Desert shrew	*Notiosorex crawfordi*	No status	Desert wash, desert scrub, desert riparian, mixed chaparral, and pinyon/juniper habitats	Invertivore	No	Yes	
Desert woodrat	*Neotoma lepida*	No status	Joshua tree, pinyon-juniper, most desert habitats	Herbivore, granivore	Yes	Yes	
Marriam kangaroo rat	*Dipodomys merriami*	No status	Desert scrub and alkali desert shrub, sagebrush, Joshua tree, prefers sparse habitat	Granivore	Yes	Yes	
Nelson's bighorn sheep	*Ovis canadesis nelsoni*	USBLM: sensitive FS: sensitive	Desert mountain ranges, alpine dwarf shrub, low sage, desert shrub	Herbivore	Yes	Yes	
Pallid bat	*Antrozous pallidus*	CSC; no federal status	Common in open dry habitats with rocky areas for roosting	Invertivore	Yes	Yes	Included in Havasu species list.
Raccoon	*Procyon lotor*	No status	All habitats except alpine and desert w/out water	Carnivore, frugivore, granivore, invertivore, piscivore	Yes	Yes	
Stripped skunk	*Mephitis mephitis*	No status	Earlier successional stages of conifer and dec. forest, intermediate canopy	Carnivore, frugivore, invertivore	Yes	Yes	
Whitetail antelope squirrel	*Ammospermophilus leucurus*	No status	Desert scrub	Omnivore	Yes	Yes	
Yuma myotis	*Myotis yumanensis*	Federal species of concern	Wide variety of habitats, optimally open forest and woodlands with a source of water over which to feed	Insectivore	Yes	Yes	Included in Havasu species list.

Notes:

CSC = Department of Fish and Game California special concern species; possibly vulnerable to extinction (have declining populations)
FS = federal status
USBLM = Bureau of Land Management

Source:

PG&E. 2006. Desert Tortoise Presence/Absence Surveys for the PG&E Topock Compressor Station Expanded Groundwater Extraction and Treatment System. July.

Table 2-2
Representative Upland Plant Species

Common Name	Scientific Name	Family	Conservation Status	Habitat	Confirmed Present	Potentially Present
Catclaw acacia	*Acacia greggii*	Fabaceae	No status	Wash	Yes	Yes
White burrobush	*Ambrosia dumosa*	Asteraceae	No status	Creosote bush scrub	No	No
Cushenbury milk-vetch	*Astragalus albens*	Fabaceae	Federally endangered	Rocky areas; elevation range 3600 to 5400 feet	No	No
Lane mountain milk-vetch	*Astragalus jaegerianus*	Fabaceae	Federally endangered	Shrub association	No	No
Cattle-spinach (also known as allscale)	*Atriplex polycarpa*	Chenopodiaceae	No status	Creosote bush scrub	Yes	Yes
Sweetbush	*Bebbia juncea aspera*	Asteraceae	No status	Creosote bush scrub	Yes	Yes
Foothills palo verde	*Cercidium microphylla*	Fabaceae	No status	Wash	Yes	Yes
Straw-bed pincushion	*Chaenactis carphoclinia*	Asteraceae	No status	Wash annuals	Yes	Yes
Brittle spiny flower (also known as spineflower)	*Chorizanthe brevicornu*	Polygonaceae	No status	Creosote bush scrub	Yes	Yes
Soft-prairie clover (also known as dalea)	*Dalea mollissima*	Fabaceae	No status	Creosote bush scrub	No	No
Barnaby smokethorn	*Dalea spinosa*	Fabaceae	No status	Wash	No	No
White brittlebush	*Encelia farinosa*	Asteraceae	No status	Creosote bush scrub	Yes	Yes
Parish's daisy	*Erigeron parishii*	Asteraceae	Federally threatened	Limestone substrate; rocky slopes	No	No
Skeleton weed	*Eriogonum deflexum*	Polygonaceae	No status	Wash annuals	Yes	Yes
Trumpet buckwheat (also known as desert trumpet)	*Eriogonum inflatum*	Polygonaceae	No status	Creosote bush scrub	Yes	Yes
Cushenbury buckwheat	*Eriogonum ovalifolium var. Vineum*	Polygonaceae	Federally endangered	Limestone areas, elevation range 4500 to 6300 feet	No	No
Barrel cactus	*Ferocactus cylindraceus*	Cactaceae	No status	Creosote bush scrub	Yes	Yes
White cheesebush	*Hymenoclea salsola*	Asteraceae	No status	Creosote bush scrub	Yes	Yes
Desert-lavender	*Hyptis emoryi*	Lamiaceae	No status	Wash	No	No
Small flower ratany	*Krameria erecta*	Krameriaceae	No status	Creosote bush scrub	No	No

Table 2-2
Representative Upland Plant Species

Common Name	Scientific Name	Family	Conservation Status	Habitat	Confirmed Present	Potentially Present
Bristley langloisia	*Langloisia setosissma*	Polemoniaceae	No status	Wash annuals	No	No
Creosote bushes	*Larrea tridentata*	Zygophyllaceae	No status	Dry hills and well-drained areas	Yes	Yes
Pepper grass	*Lepidium densiflorum*	Brassicaceae	No status	Wash annuals	Yes	Yes
Arizona lupine	*Lupinus arizonicus*	Fabaceae	No status	Wash annuals	Yes	Yes
Beavertail cactus	*Opuntia basilaris*	Cactaceae	No status	Creosote bush scrub	Yes	Yes
Straw-top cholla (also known as golden cholla)	*Opuntia echinocarpa*	Cactaceae	Vulnerable	Creosote bush scrub	Yes	Yes
Cushenbury oxytheca	*Oxytheca parishii Var. Goodmaniana*	Polygonaceae	Federally endangered	Limestone talus, 1300 to 2000 meters	No	No
Smoke tree	*Psorothamnus spinosus*	Fabaceae	Arizona state protected status: salvage assessed	Wash	Yes	Yes
Notch-leafed phacelia	*Phacelia crenulata*	Hydrophyllaceae	No status	Wash	Yes	Yes
Honey mesquite	*Prosopis glandulosa*	Fabaceae	No status	Wash	Yes	Yes
Common Mediteranean grass (also known as split grass)	*Schismus barbatas*	Poaceae	No status	Wash annuals	No	No
Brown-plume wire-lettuce	*Stephanomeria pauciflora*	Asteraceae	No status	Wash	Yes	Yes

Table 2-3
Representative Riparian Animal Species

Common Name	Scientific Name	Conservation Status	Habitat	Feeding Guild	Confirmed Present	Potentially Present	Comments
Birds							
American coot	*Fulica americana*	No status	Dense emergent aquatic vegetation	Omnivore	Yes	Yes	
Arizona Bell's vireo	*Vireo bellii arisonae*	State endangered	Dense vegetation	Insectivore	Yes	Yes	
Belted kingfisher	*Ceryle alcyon*	No status	Riparian or aquatic	Carnivore	Yes	Yes	
Brown-crested flycatcher	*Yiarchus tryannulus*	LC; DFG-CSC	Riparian thicket	Insectivore	Yes	Yes	Nests locally according to Havasu.
California brown pelican	*Pelecanus occidentalis californicus*	State and federally endangered	Uncommon transient at many Arizona lakes and rivers	Piscivore	No	Yes	
Crissal thrasher	*Toxostoma crissale*	LC, DFG-CSC, USFWS-BCC	Dense thickets	Omnivore	Yes	Yes	Common and nesting in Havasu.
Gambel's quail	*Callipepla gambelii*	No status	Desert habitats	Herbivore	Yes	Yes	Common and nesting in Havasu.
Gila woodpecker	*Melanerpes uropygailis*	State endangered	Riparian trees	Insectivore, herbivore	Yes	Yes	Common and nesting in Havasu.
Great blue heron	*Ardea herodias*	LC, CDF sensitive	Requires trees for nesting	Carnivore	Yes	Yes	Common and nesting in Havasu.
Great egret	*Casmerodius albus*	LC, CDF sensitive	Requires trees for nesting	Carnivore, insectivore	Yes	Yes	Common and nesting in Havasu.
Great-tailed grackle	*Quiscalus mexicanus*	No status	Open near water	Omnivore	Yes	Yes	Common and nesting in Havasu.
Least Bell's vireo	*Vireo bellii pusillus*	State and federally endangered	Dense vegetation	Insectivore	Yes	Yes	Common and nesting in Havasu.
Lesser nighthawk	*Chordeiles acutipennis*	No status	Riparian and open low lands	Insectivore	Yes	Yes	Common and nesting in Havasu.

Table 2-3
Representative Riparian Animal Species

Common Name	Scientific Name	Conservation Status	Habitat	Feeding Guild	Confirmed Present	Potentially Present	Comments
Mallard	*Anas platyrhynchos*	No status	River, riparian vegetation	90% herbivore, 10% insectivore	Yes	Yes	Common and nesting in Havasu.
Northern rough-winged swallow	*Stegidopteryx serripennis*	No status	Trees or cliffs	Insectivore	Yes	Yes	Common and nesting in Havasu.
Pied-billed grebe	*Podilymbus podiceps*	No status	Open water and vegetation	Omnivore	Yes	Yes	Common and nesting in Havasu.
Song sparrow	*Melospiza melodia*	LC in Alameda and San Pablo counties	Riparian	Herbivore, carnivore	Yes	Yes	Common and nesting in Havasu.
Sonoran yellow warbler	*Dendroica petechia sonorana*	LC; DFG-CSC, USFWS-BCC	Riparian woodlands, coastal/desert lowlands	Insectivore, herbivore	No	No	
Southwestern willow flycatcher	*Epidonax tailli extimus*	Federally endangered	Dense riparian vegetation	Insectivore	Yes	Yes	Listed as nesting locally in Havasu, but
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	State endangered	Densely foliated deciduous trees esp. willows; large blocks of Riparian woodland	Insectivore	Yes	Yes	
Yellow-breasted chat	*Icteria virens*	LC, DFG-CSC	Riparian thickets	Insectivore, herbivore	Yes	Yes	Listed as nesting locally in Havasu, and common
Yuma clapper rail	*Rallus longirostris yumanensis*	State and federally endangered	Fresh water and brackish marshes	Insectivore	Yes	Yes	Listed as nesting locally in Havasu, but uncommon.
Reptiles							
Pine-gopher snake	*Pituophis melanoleucus*	No status	All habitats; absent from densely forested areas	Carnivore	Yes	Yes	Included in Havasu species list.
Western diamondback rattlesnake	*Crotalus atrox*	No status	Flats and foot hills, prefers brushy areas, riparian habitats	Carnivore	Yes	Yes	Included in Havasu species list.

Table 2-3
Representative Riparian Animal Species

Common Name	Scientific Name	Conservation Status	Habitat	Feeding Guild	Confirmed Present	Potentially Present	Comments
Amphibians							
Arroyo toad	*Bufo microscaphus californicus*	Federally endangered	Desert riparian	Insectivore	No	No	
Fish							
Bonytail chub	*Gila elegans*	State and federally endangered	Warm, swift, turbid mainstem rivers of the Colorado River basin	Omnivore	No	Yes	
Razorback sucker	*Xyrauchen texanus*	State and federally endangered	Riverine and lacustrine areas; generally not in fast-moving waters and may use backwaters	Benthic invertebrates	No	Yes	
Colorado pikeminnow	*Ptychocheilus lucius*	State and federally endangered	Colorado River	Carnivore	No	No	This species extirpated from the lower Colorado River basin.
Mammals							
Beaver	*Castor canadesis*	No status	Riparian	Herbivore	Yes	Yes	
Bobcat	*Lynx rufus*	No status	Brushy stages of low/mid elevation conifer, oak, riparian	Carnivore	Yes	Yes	
Cave myotis	*Myotis velifer*	CSC; no federal status	Desert scrub, desert wash, desert succulent scrub, and desert riparian	Insectivore	Yes	Yes	Included in Havasu species list.
Deer mouse	*Peromyscus maniculatus*	No status	All habitats	Herbivore, invertivore	Yes	Yes	

Table 2-3
Representative Riparian Animal Species

Common Name	Scientific Name	Conservation Status	Habitat	Feeding Guild	Confirmed Present	Potentially Present	Comments
Desert shrew	*Notiosorex crawfordi*	No status	Desert wash, desert scrub, desert riparian, mixed chaparral, and pinyon/juniper habitats	Invertivore	No	Yes	
Raccoon	*Procyon lotor*	No status	All habitats except alpine and desert w/out water	Carnivore, frugivore, granivore, invertivore, piscivore	Yes	Yes	

Notes:

LC = Least Concern. Least Concern (LC) is an International Union for the Conservation of Nature and Natural Resources (IUCN) category assigned to extant species or lower taxa which have been evaluated but do not qualify for any other category. As such they do not qualify as threatened, nor Near Threatened, nor (prior to 2001) Conservation Dependent.
CDF = California Department of Forestry and Fire Protection: Sensitive
CSC = Department of Fish and Game California special concern species; possibly vulnerable to extinction (have declining populations)
DFG-CSC = Department of Fish and Game - California Special Concern Species
USFWS-BCC = U.S. Fish and Wildlife Service: Birds of Conservation Concern

Table 2-4
Representative Riparian Plant Species

Common Name	Scientific Name	Family	Conservation Status	Habitat	Confirmed Present	Potentially Present
Sedge	*Carex* sp.	Cyperaceae	No status	Wetland	Yes	Yes
Palo verde	*Cericidum* sp.	Fabaceae	No status	Desert riparian	Yes	Yes
Arrowweed	*Pluchea sericea*	Asteraceae	No status	Desert scrub, desert wash, desert riparian	Yes	Yes
Common reed	*Phragmites communis*	Poaceae	No status	Wetland	Yes	Yes
Mesquite	*Prosopis* sp.	Fabaceae	No status	Desert riparian, desert wash	Yes	Yes
Bulrush	*Scirpus* sp.	Cyperaceae	No status	Wetland	Yes	Yes
Tamarisk (also known as salt cedar)	*Tamarix* sp.	Tamaraceae	No status	Desert riparian, desert wash	Yes	Yes
Cattail	*Typha* sp.	Typhaceae	No status	Wetland	Yes	Yes

Table 2-5
SWMUs, AOCs, and Other Undesignated Areas

SWMU/AOC/Undesignated Area	Location Inside or Outside Developed Areas of Topock Compressor Station	Risk Assessment Activities
Groundwater		
SWMU 1- Former Percolation Bed	Outside	HHRA and ERA
SWMU 2 - Inactive Injection Well (PGE-08)	Inside	HHRA and ERA
Soil		
SWMU 5 - Former Sludge Drying Beds[a]	Inside	No HHRA Activities Planned
SWMU 6 - Former Chromate Reduction Tank[a]	Inside	No HHRA Activities Planned
SWMU 8 - Former Process Pump Tank[a]	Inside	No HHRA Activities Planned
SWMU 9 - Former Transfer Sump[a]	Inside	No HHRA Activities Planned
Unit 4.3 - Oil/Water Holding Tank[a]	Inside	No HHRA Activities Planned
Unit 4.4 - Former Oil/Water Separator[a]	Inside	No HHRA Activities Planned
Unit 4.5 - Former Portable Waste Oil Storage Tank[a]	Inside	No HHRA Activities Planned
SWMU 1/AOC 1 - Former Percolation Bed	Outside	HHRA and ERA
AOC 4 - Debris Ravine	Outside	HHRA and ERA
AOC 5 - Cooling Tower A	Inside	HHRA

Table 2-5
SWMUs, AOCs, and Other Undesignated Areas

SWMU/AOC/Undesignated Area	Location Inside or Outside Developed Areas of Topock Compressor Station	Risk Assessment Activities
AOC 6 - Cooling Tower B	Inside	HHRA
AOC 7 - Hazardous Material Storage Area	Inside	HHRA
AOC 8 – Paint Lockers	Inside	HHRA
AOC 9 - Southeast Fence Line (Outside Visitor Parking Area)	Outside	HHRA and ERA
AOC 10 - East Ravine	Outside	HHRA and ERA
AOC 11 - Topographic Low Areas	Outside	HHRA and ERA
AOC 12 - Fill Area	Outside	HHRA and ERA
AOC 13 - Unpaved Areas within the Compressor Station	Inside	HHRA
AOC 14 - Railroad Debris Site	Outside	HHRA and ERA
AOC 15 - Auxiliary Jacket Water Cooling Pumps	Inside	HHRA
AOC 16 - Sand Blast Shelter	Inside	HHRA
AOC 17 - Onsite Septic System	Inside	HHRA
AOC 18 - Combined Wastewater Transference Pipelines[a]	Inside	No HHRA Activities Planned
AOC 19 - Former Cooling Liquid Mixing Area	Inside	HHRA
AOC 20 - Industrial Floor Drains	Inside	HHRA

Table 2-5
SWMUs, AOCs, and Other Undesignated Areas

SWMU/AOC/Undesignated Area	Location Inside or Outside Developed Areas of Topock Compressor Station	Risk Assessment Activities
Potential Pipe Disposal Area	Outside	HHRA and ERA
Former 300B Pipeline Liquids Tank[a]	Outside	No HHRA or ERA Activities Planned; Pending Results from Part A Work Plan Investigation

Notes:

[a] These units have been previously closed but additional investigation has been requested by the California Department of Toxic Substances Control (DTSC).

[b] Sampling will not proceed unless buried metal piping is located during geophysical analysis. Asbestos is the only potential constituent of concern.

AOC = Area of Concern
ERA = Ecological Risk Assessment
HHRA = Human Health Risk Assessment
SWMU = Solid Waste Management Unit

Sources:

Part A Work Plan = *Draft RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan Part A* (CH2M HILL, 2006)

Part B Work Plan = *Draft RCRA Facility Investigation/Remedial Investigation Soil Investigation Work Plan Part B* (CH2M HILL, 2007)

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Aluminum			Antimony			Arsenic			Barium		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
CW-1D	02/07/2005	10/17/2007	8	02/07/2005	10/17/2007	8	02/07/2005	10/17/2007	8	02/07/2005	10/17/2007	8
CW-1M	02/08/2005	10/17/2007	8	02/08/2005	10/17/2007	8	02/08/2005	10/17/2007	8	02/08/2005	10/17/2007	8
CW-2D	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8
CW-2M	02/09/2005	10/18/2007	8	02/09/2005	10/18/2007	8	02/09/2005	10/18/2007	8	02/09/2005	10/18/2007	8
CW-3D	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8
CW-3M	02/10/2005	10/18/2007	8	02/10/2005	10/18/2007	8	02/10/2005	10/18/2007	8	02/10/2005	10/18/2007	8
CW-4D	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8
CW-4M	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8
MW-1	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2
MW-10	09/21/2004	05/04/2006	6	06/10/2004	03/11/2008	15	09/21/2004	03/11/2008	14	07/01/1997	03/11/2008	18
MW-11	09/21/2004	12/12/2005	5	06/10/2004	10/12/2006	10	09/21/2004	07/17/2007	11	07/01/1997	05/03/2007	14
MW-12	06/09/2004	12/13/2005	6	06/09/2004	05/05/2008	17	06/09/2004	05/05/2008	17	07/01/1997	05/05/2008	21
MW-13	12/13/2005	05/02/2006	2	12/13/2005	05/02/2006	2	12/13/2005	05/02/2006	2	07/01/1997	05/02/2006	7
MW-14	09/08/2004	05/02/2006	2	05/11/2005	05/02/2006	2	05/11/2005	05/02/2006	2	07/01/1997	05/02/2006	7
MW-15							05/04/2007	05/04/2007	1	07/01/1997	05/04/2007	6
MW-19	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	09/01/2000	05/02/2006	5
MW-20-100				10/10/2007	10/10/2007	1	10/10/2007	10/10/2007	1	06/15/1999	10/10/2007	5
MW-20-130	09/24/2004	12/16/2005	5	09/24/2004	05/03/2007	12	09/24/2004	05/03/2007	12	06/15/1999	05/03/2007	16
MW-20-70	09/24/2004	05/05/2006	6	09/24/2004	10/11/2007	13	09/24/2004	10/11/2007	13	06/15/1999	10/11/2007	17
MW-21	12/14/2005	12/14/2005	1	12/14/2005	05/06/2008	4	12/14/2005	05/06/2008	4	09/01/2000	05/06/2008	8
MW-22				12/17/2007	07/29/2008	3	12/17/2007	07/29/2008	3	09/01/2000	07/29/2008	7
MW-23				12/11/2007	05/06/2008	4	12/11/2007	05/06/2008	4	09/01/2000	05/06/2008	8

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Aluminum			Antimony			Arsenic			Barium		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-24A				12/12/2007	05/08/2008	3	07/18/2007	05/08/2008	4	09/01/2000	05/08/2008	7
MW-24B	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	07/18/2007	2	09/01/2000	05/04/2006	5
MW-24BR										09/01/2000	06/08/2004	4
MW-25	06/09/2004	05/03/2006	6	06/09/2004	03/06/2007	10	06/09/2004	03/06/2007	10	06/15/1999	03/06/2007	14
MW-26				12/11/2007	05/05/2008	3	12/11/2007	05/05/2008	3	06/09/1999	05/05/2008	7
MW-27-20	02/19/2004	02/19/2004	1							06/15/1999	06/10/2003	4
MW-27-60										02/23/2005	03/14/2005	2
MW-27-85										02/23/2005	03/14/2005	2
MW-28-25	02/20/2004	02/20/2004	1							06/15/1999	06/10/2003	4
MW-28-90										06/10/2004	06/10/2004	1
MW-29										06/15/1999	06/11/2003	4
MW-3	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2
MW-30-30	02/19/2004	02/19/2004	1	10/08/2007	10/08/2007	1	10/08/2007	10/08/2007	1	06/15/1999	10/08/2007	5
MW-30-50										06/10/2003	06/10/2003	1
MW-31-135							05/01/2007	05/01/2007	1	06/10/2004	05/01/2007	2
MW-31-60	03/09/2005	03/09/2005	1	03/09/2005	10/06/2005	2	03/09/2005	10/06/2005	2	06/15/1999	10/06/2005	6
MW-32-20	02/18/2004	02/18/2004	1							06/10/2003	06/10/2003	1
MW-32-35	02/18/2004	02/18/2004	1	12/10/2007	05/06/2008	3	12/10/2007	05/06/2008	3	06/10/2003	05/06/2008	4
MW-33-150										03/16/2005	03/16/2005	1
MW-33-210	05/05/2006	05/05/2006	1	05/05/2006	05/05/2006	1	05/05/2006	05/05/2006	1	02/24/2005	05/05/2006	3
MW-33-40	02/19/2004	02/19/2004	1							06/11/2003	06/09/2004	2
MW-33-90	02/17/2004	05/03/2006	2	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	06/11/2003	05/03/2006	3

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Aluminum			Antimony			Arsenic			Barium		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-34-100	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	05/03/2006	04/30/2007	2	02/23/2005	04/30/2007	4
MW-34-55	02/18/2004	12/14/2005	6	06/08/2004	10/04/2006	9	06/08/2004	10/04/2006	9	06/16/2003	10/04/2006	10
MW-34-80	06/08/2004	12/14/2005	6	06/08/2004	04/30/2007	13	06/08/2004	04/30/2007	13	06/16/2003	04/30/2007	15
MW-35-135	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/04/2007	2	06/10/2004	05/04/2007	3
MW-35-60	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	06/10/2004	05/02/2006	2
MW-36-100										06/15/2004	06/15/2004	1
MW-36-20										06/15/2004	06/15/2004	1
MW-36-40										06/16/2004	06/16/2004	1
MW-36-50										06/17/2004	06/17/2004	1
MW-36-70										06/17/2004	06/17/2004	1
MW-36-90										06/15/2004	06/15/2004	1
MW-37D	06/11/2004	05/03/2006	7	06/11/2004	05/03/2007	13	06/11/2004	05/03/2007	13	06/11/2004	05/03/2007	13
MW-37S	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	06/10/2004	05/04/2006	2
MW-38D							05/03/2007	07/17/2007	2	06/10/2004	05/03/2007	2
MW-38S	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	07/17/2007	2	06/11/2004	05/04/2006	2
MW-39-100										06/15/2004	06/15/2004	1
MW-39-40										06/18/2004	06/18/2004	1
MW-39-50										06/18/2004	06/18/2004	1
MW-39-60	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	06/18/2004	05/02/2006	2
MW-39-70										06/18/2004	06/18/2004	1
MW-39-80										06/17/2004	06/17/2004	1
MW-4	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Aluminum			Antimony			Arsenic			Barium		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-40D							05/04/2007	05/04/2007	1	06/14/2004	05/04/2007	2
MW-40S	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	06/15/2004	05/03/2006	2
MW-41D												
MW-41M												
MW-41S												
MW-42-30										02/23/2005	03/16/2005	2
MW-42-55										02/23/2005	03/16/2005	2
MW-42-65										02/24/2005	03/16/2005	2
MW-43-25	03/07/2005	03/07/2005	1	12/10/2007	05/07/2008	3	12/10/2007	05/07/2008	3	03/15/2005	05/07/2008	4
MW-43-75	03/07/2005	03/07/2005	1							03/15/2005	03/15/2005	1
MW-43-90	03/07/2005	03/07/2005	1							03/15/2005	03/15/2005	1
MW-44-115				12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-44-125							05/03/2007	05/03/2007	1	05/03/2007	05/03/2007	1
MW-44-70												
MW-45-095a							05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1
MW-46-175							05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1
MW-46-205												
MW-47-115												
MW-47-55							05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1
MW-48				12/14/2007	05/07/2008	3	12/14/2007	05/07/2008	3	12/14/2007	05/07/2008	3
MW-49-135												
MW-49-275												

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Aluminum			Antimony			Arsenic			Barium		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-49-365												
MW-5	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-50-095												
MW-50-200				12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-51				12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-52D												
MW-52M												
MW-52S												
MW-53D												
MW-53M												
MW-54-140												
MW-54-195												
MW-54-85												
MW-55-120												
MW-55-45												
MW-56D												
MW-56M												
MW-56S												
MW-6	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-7	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-8	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-9	12/17/2004	12/17/2004	1	12/17/2004	12/17/2004	1	12/17/2004	05/03/2007	2	07/01/1997	05/03/2007	7

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Aluminum			Antimony			Arsenic			Barium		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MWP-12												
OW-1D	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	15
OW-1M	10/01/2004	10/16/2007	15	12/21/2004	10/16/2007	14	12/21/2004	10/16/2007	14	10/01/2004	10/16/2007	15
OW-1S	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	13
OW-2D	01/13/2005	10/17/2007	13	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14
OW-2M	07/28/2005	10/16/2007	12	05/11/2005	10/16/2007	13	05/11/2005	10/16/2007	13	05/11/2005	10/16/2007	13
OW-2S	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	13
OW-3D	10/28/2004	12/14/2004	3	12/14/2004	12/14/2004	1	12/14/2004	12/14/2004	1	10/28/2004	12/14/2004	2
OW-3M	10/28/2004	05/04/2006	3	12/15/2004	05/04/2006	2	12/15/2004	05/01/2007	3	10/28/2004	05/01/2007	4
OW-3S	10/28/2004	11/16/2004	2	12/15/2004	12/15/2004	1	12/15/2004	04/30/2007	2	10/28/2004	04/30/2007	3
OW-5D	12/22/2004	10/17/2007	13	12/22/2004	10/17/2007	14	12/22/2004	10/17/2007	14	12/22/2004	10/17/2007	14
OW-5M	01/13/2005	10/17/2007	13	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14
OW-5S	12/21/2004	10/17/2007	13	12/21/2004	10/17/2007	14	12/21/2004	10/17/2007	14	12/21/2004	10/17/2007	14
Park Moabi-4				05/02/2007	05/02/2007	1	05/02/2007	05/02/2007	1	05/02/2007	05/02/2007	1
PE-1							03/17/2006	04/05/2006	2	03/21/2005	10/03/2005	2
PGE-6										07/01/1997	11/29/2001	3
PGE-7										09/01/2000	11/29/2001	2
PGE-7BR												
PGE-8										07/01/1997	11/29/2001	3
PT-1D							03/17/2006	04/06/2006	2			
PT-1M							03/17/2006	04/06/2006	2			

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Aluminum			Antimony			Arsenic			Barium		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PT-1S							03/17/2006	04/06/2006	2			
PT-2D							03/17/2006	04/06/2006	2			
PT-2M							03/17/2006	04/06/2006	2			
PT-2S							03/17/2006	04/06/2006	2			
PT-3D							03/18/2006	04/05/2006	2			
PT-3M							03/18/2006	04/07/2006	2			
PT-3S							03/16/2006	04/03/2006	2			
PT-4D							03/15/2006	04/05/2006	2			
PT-4M							03/15/2006	04/07/2006	2			
PT-4S							03/15/2006	04/06/2006	2			
PT-5D							03/16/2006	04/07/2006	2			
PT-5M							03/16/2006	04/07/2006	2			
PT-5S							03/16/2006	04/07/2006	2			
PT-6D							03/16/2006	04/04/2006	2			
PT-6M							03/16/2006	04/04/2006	2			
PT-6S							03/18/2006	04/04/2006	2			
PT-7D							07/18/2007	07/18/2007	1			
PT-7M							07/19/2007	07/19/2007	1			
PT-7S							07/18/2007	07/18/2007	1			
PT-8D							07/16/2007	07/16/2007	1			
PT-8M							07/18/2007	07/18/2007	1			
PT-8S							07/16/2007	07/16/2007	1			

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Aluminum			Antimony			Arsenic			Barium		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PT-9D							07/17/2007	07/17/2007	1			
PT-9M							07/17/2007	07/17/2007	1			
PT-9S							07/17/2007	07/17/2007	1			
PTI-1D							03/15/2006	04/03/2006	2			
PTI-1M							03/15/2006	04/04/2006	2			
PTI-1S							03/15/2006	04/05/2006	2			
PTR-1							07/19/2007	07/19/2007	1			
PTR-2							07/18/2007	07/18/2007	1			
TW-1	12/21/2004	12/21/2004	1	12/21/2004	05/08/2008	4	12/21/2004	05/08/2008	4	12/21/2004	05/08/2008	4
TW-2D	07/29/2004	06/15/2005	3	07/29/2004	06/15/2005	3	07/29/2004	04/05/2006	5	07/29/2004	06/15/2005	3
TW-2S	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3
TW-3D							03/17/2006	04/05/2006	2			
TW-4												
TW-5												
Number of Samples			294			384			460			559
Count of Wells Sampled			64			68			110			107

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Beryllium			Cadmium			Chromium, hexavalent			Chromium, total		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
CW-1D	02/07/2005	10/17/2007	7	02/07/2005	10/17/2007	7	02/07/2005	10/17/2007	8	02/07/2005	10/17/2007	8
CW-1M	02/08/2005	10/17/2007	7	02/08/2005	10/17/2007	7	02/08/2005	10/17/2007	8	02/08/2005	10/17/2007	8
CW-2D	02/08/2005	10/18/2007	7	02/08/2005	10/18/2007	7	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8
CW-2M	02/09/2005	10/18/2007	7	02/09/2005	10/18/2007	7	02/09/2005	10/18/2007	8	02/09/2005	10/18/2007	8
CW-3D	02/08/2005	10/18/2007	7	02/08/2005	10/18/2007	7	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8
CW-3M	02/10/2005	10/18/2007	7	02/10/2005	10/18/2007	7	02/10/2005	10/18/2007	8	02/10/2005	10/18/2007	8
CW-4D	02/07/2005	10/18/2007	7	02/07/2005	10/18/2007	7	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8
CW-4M	02/07/2005	10/18/2007	7	02/07/2005	10/18/2007	7	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8
MW-1	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	09/01/1997	07/18/2005	6	07/26/1997	07/18/2005	9
MW-10	09/21/2004	03/11/2008	14	09/21/2004	03/11/2008	14	07/01/1997	10/02/2007	37	07/01/1997	03/11/2008	38
MW-11	09/21/2004	10/12/2006	9	09/21/2004	10/12/2006	9	07/01/1997	07/17/2007	34	07/01/1997	07/17/2007	35
MW-12	06/09/2004	05/05/2008	17	06/09/2004	05/05/2008	17	07/01/1997	05/05/2008	40	07/01/1997	05/05/2008	41
MW-13	12/13/2005	05/02/2006	2	12/13/2005	05/02/2006	2	07/01/1997	10/02/2007	37	07/01/1997	10/02/2007	36
MW-14	05/11/2005	05/02/2006	2	05/11/2005	05/02/2006	2	07/01/1997	10/02/2007	37	07/01/1997	10/02/2007	36
MW-15							07/01/1997	10/02/2007	32	07/01/1997	10/02/2007	31
MW-19	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	06/15/1998	10/05/2007	34	06/15/1998	10/05/2007	33
MW-20-100	10/10/2007	10/10/2007	1	10/10/2007	10/10/2007	1	06/15/1999	10/10/2007	37	06/15/1999	10/10/2007	36
MW-20-130	09/24/2004	05/03/2007	12	09/24/2004	05/03/2007	12	06/15/1999	10/05/2007	38	06/15/1999	10/05/2007	37
MW-20-70	09/24/2004	10/11/2007	13	09/24/2004	10/11/2007	13	06/15/1998	10/11/2007	39	06/15/1998	10/11/2007	38
MW-21	12/14/2005	05/06/2008	4	12/14/2005	05/06/2008	4	06/15/1999	05/06/2008	36	06/15/1999	05/06/2008	42
MW-22	12/17/2007	07/29/2008	3	12/17/2007	07/29/2008	3	06/15/1998	10/10/2007	34	06/15/1998	07/29/2008	38
MW-23	12/11/2007	05/06/2008	4	12/11/2007	05/06/2008	4	06/15/1998	05/06/2008	36	06/15/1998	05/06/2008	38

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Beryllium			Cadmium			Chromium, hexavalent			Chromium, total		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-24A	12/12/2007	05/08/2008	3	12/12/2007	05/08/2008	3	06/15/1998	07/18/2007	32	06/15/1998	05/08/2008	34
MW-24B	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	06/15/1998	07/18/2007	34	06/15/1998	07/18/2007	32
MW-24BR							06/15/1998	05/08/2008	34	06/15/1998	05/08/2008	33
MW-25	06/09/2004	03/06/2007	10	06/09/2004	03/06/2007	10	06/15/1999	10/02/2007	33	06/15/1999	10/02/2007	32
MW-26	12/11/2007	05/05/2008	3	12/11/2007	05/05/2008	3	06/09/1999	10/02/2007	35	06/09/1999	05/05/2008	37
MW-27-20							06/15/1999	10/02/2007	68	06/15/1999	10/02/2007	68
MW-27-60							02/23/2005	10/02/2007	18	02/23/2005	10/02/2007	18
MW-27-85							02/23/2005	05/06/2008	42	02/23/2005	05/06/2008	42
MW-28-25							06/15/1999	10/04/2007	67	06/15/1999	10/04/2007	68
MW-28-90							04/29/2004	05/07/2008	45	04/29/2004	05/07/2008	46
MW-29							06/15/1999	10/04/2007	42	06/15/1999	10/04/2007	43
MW-3	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	09/01/1997	07/18/2005	6	07/26/1997	07/18/2005	9
MW-30-30	10/08/2007	10/08/2007	1	10/08/2007	10/08/2007	1	06/15/1999	10/08/2007	58	06/15/1999	10/08/2007	66
MW-30-50							03/19/2003	10/11/2006	45	03/19/2003	10/11/2006	51
MW-31-135							04/16/2004	10/01/2007	14	04/16/2004	10/01/2007	14
MW-31-60	03/09/2005	10/06/2005	2	03/09/2005	10/06/2005	2	06/15/1999	10/04/2007	36	06/15/1999	10/04/2007	35
MW-32-20							03/19/2003	10/01/2007	30	03/19/2003	10/01/2007	34
MW-32-35	12/10/2007	05/06/2008	3	12/10/2007	05/06/2008	3	03/19/2003	10/01/2007	29	03/19/2003	05/06/2008	37
MW-33-150							03/02/2005	05/06/2008	24	03/02/2005	05/06/2008	24
MW-33-210	05/05/2006	05/05/2006	1	05/05/2006	05/05/2006	1	02/24/2005	05/05/2008	24	02/24/2005	05/05/2008	24
MW-33-40							03/19/2003	05/05/2008	29	03/19/2003	05/05/2008	34
MW-33-90	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	03/19/2003	05/05/2008	56	03/19/2003	05/05/2008	58

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Beryllium			Cadmium			Chromium, hexavalent			Chromium, total		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-34-100	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	02/23/2005	05/06/2008	79	02/23/2005	05/06/2008	79
MW-34-55	06/08/2004	10/04/2006	9	06/08/2004	10/04/2006	9	06/16/2003	10/03/2007	44	06/16/2003	10/03/2007	52
MW-34-80	06/08/2004	04/30/2007	13	06/08/2004	04/30/2007	13	06/16/2003	05/06/2008	88	06/16/2003	05/06/2008	92
MW-35-135	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	04/15/2004	10/01/2007	14	04/15/2004	10/01/2007	14
MW-35-60	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	04/15/2004	10/01/2007	13	04/15/2004	10/01/2007	14
MW-36-100							05/21/2004	10/10/2007	51	05/21/2004	10/10/2007	51
MW-36-20							05/18/2004	10/03/2007	17	05/18/2004	10/03/2007	17
MW-36-40							05/18/2004	10/03/2007	17	05/18/2004	10/03/2007	17
MW-36-50							05/19/2004	10/10/2007	17	05/19/2004	10/10/2007	17
MW-36-70							05/19/2004	10/09/2007	26	05/19/2004	10/09/2007	26
MW-36-90							05/18/2004	10/09/2007	39	05/18/2004	10/09/2007	39
MW-37D	06/11/2004	05/03/2007	13	06/11/2004	05/03/2007	13	05/19/2004	10/04/2007	15	05/19/2004	10/04/2007	15
MW-37S	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/19/2004	10/04/2007	14	05/19/2004	10/04/2007	14
MW-38D							05/05/2004	07/17/2007	11	05/05/2004	07/17/2007	11
MW-38S	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/14/2004	07/17/2007	11	05/14/2004	07/17/2007	11
MW-39-100							05/21/2004	10/10/2007	41	05/21/2004	10/10/2007	41
MW-39-40							05/20/2004	10/08/2007	21	05/20/2004	10/08/2007	21
MW-39-50							05/20/2004	10/08/2007	18	05/20/2004	10/08/2007	18
MW-39-60	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/20/2004	10/08/2007	18	05/20/2004	10/08/2007	18
MW-39-70							05/20/2004	10/08/2007	27	05/20/2004	10/08/2007	28
MW-39-80							05/20/2004	10/08/2007	40	05/20/2004	10/08/2007	40
MW-4	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	09/01/1997	07/18/2005	6	07/26/1997	07/18/2005	9

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Beryllium			Cadmium			Chromium, hexavalent			Chromium, total		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-40D							05/10/2004	10/04/2007	15	05/10/2004	10/04/2007	15
MW-40S	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	05/11/2004	10/04/2007	13	05/11/2004	10/04/2007	13
MW-41D							11/18/2004	10/03/2007	11	11/18/2004	10/03/2007	11
MW-41M							11/18/2004	10/03/2007	11	11/18/2004	10/03/2007	11
MW-41S							11/18/2004	10/03/2007	11	11/18/2004	10/03/2007	11
MW-42-30							02/23/2005	10/04/2007	9	02/23/2005	10/04/2007	9
MW-42-55							02/23/2005	05/06/2008	12	02/23/2005	05/06/2008	12
MW-42-65							02/24/2005	05/06/2008	12	02/24/2005	05/06/2008	12
MW-43-25	12/10/2007	05/07/2008	3	12/10/2007	05/07/2008	3	03/07/2005	10/02/2007	10	03/07/2005	05/07/2008	13
MW-43-75							03/07/2005	10/02/2007	19	03/07/2005	10/02/2007	19
MW-43-90							03/07/2005	10/02/2007	19	03/07/2005	10/02/2007	19
MW-44-115	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	03/14/2006	05/08/2008	32	03/14/2006	05/08/2008	34
MW-44-125							03/22/2006	05/08/2008	29	03/22/2006	05/08/2008	29
MW-44-70							03/09/2006	05/07/2008	12	03/09/2006	05/07/2008	12
MW-45-095a							03/24/2006	05/04/2007	3	03/24/2006	05/04/2007	3
MW-46-175							03/14/2006	05/07/2008	29	03/14/2006	05/07/2008	29
MW-46-205							03/14/2006	05/07/2008	14	03/14/2006	05/07/2008	14
MW-47-115							03/23/2006	05/07/2008	8	03/23/2006	05/07/2008	8
MW-47-55							03/23/2006	05/07/2008	8	03/23/2006	05/07/2008	8
MW-48	12/14/2007	05/07/2008	3	12/14/2007	05/07/2008	3	05/18/2006	05/07/2008	8	05/18/2006	05/07/2008	10
MW-49-135							04/25/2006	10/10/2007	7	04/25/2006	10/10/2007	7
MW-49-275							04/25/2006	10/09/2007	7	04/25/2006	10/09/2007	7

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Beryllium			Cadmium			Chromium, hexavalent			Chromium, total		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-49-365							04/26/2006	10/09/2007	7	04/26/2006	10/09/2007	7
MW-5	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	6	07/26/1997	07/18/2005	9
MW-50-095							05/09/2006	05/07/2008	8	05/09/2006	05/07/2008	8
MW-50-200	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	05/09/2006	05/08/2008	8	05/09/2006	05/08/2008	10
MW-51	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	05/12/2006	10/05/2007	7	05/12/2006	05/08/2008	10
MW-52D							03/13/2007	05/07/2008	8	03/13/2007	05/07/2008	8
MW-52M							03/13/2007	05/07/2008	8	03/13/2007	05/07/2008	8
MW-52S							03/13/2007	05/07/2008	8	03/13/2007	05/07/2008	8
MW-53D							04/03/2007	05/07/2008	8	04/03/2007	05/07/2008	8
MW-53M							04/03/2007	05/07/2008	8	04/03/2007	05/07/2008	8
MW-54-140							04/14/2008	07/09/2008	3	04/14/2008	07/09/2008	3
MW-54-195							04/14/2008	07/09/2008	3	04/14/2008	07/09/2008	3
MW-54-85							04/15/2008	07/09/2008	3	04/15/2008	07/09/2008	3
MW-55-120							04/15/2008	07/08/2008	3	04/15/2008	07/08/2008	3
MW-55-45							04/15/2008	07/08/2008	3	04/15/2008	07/08/2008	3
MW-56D							04/29/2008	07/09/2008	3	04/29/2008	07/09/2008	3
MW-56M							04/29/2008	07/09/2008	3	04/29/2008	07/09/2008	3
MW-56S							04/29/2008	07/09/2008	3	04/29/2008	07/09/2008	3
MW-6	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	6	07/26/1997	07/18/2005	9
MW-7	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	6	07/26/1997	07/18/2005	9
MW-8	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	6	07/26/1997	07/18/2005	9
MW-9	12/17/2004	12/17/2004	1	12/17/2004	12/17/2004	1	07/01/1997	10/04/2007	35	07/01/1997	10/04/2007	34

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Beryllium			Cadmium			Chromium, hexavalent			Chromium, total		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MWP-12							11/05/2003	11/05/2003	1	11/05/2003	11/05/2003	1
OW-1D	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	17	09/30/2004	10/16/2007	19
OW-1M	12/21/2004	10/16/2007	14	12/21/2004	10/16/2007	14	10/01/2004	10/16/2007	18	10/01/2004	10/16/2007	18
OW-1S	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	15	12/21/2004	10/16/2007	15
OW-2D	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	16	01/13/2005	10/17/2007	16
OW-2M	05/11/2005	10/16/2007	13	05/11/2005	10/16/2007	13	01/27/2005	10/16/2007	16	01/27/2005	10/16/2007	16
OW-2S	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	16	12/29/2004	10/17/2007	16
OW-3D	12/14/2004	12/14/2004	1	12/14/2004	12/14/2004	1	10/28/2004	10/03/2007	8	10/28/2004	10/03/2007	8
OW-3M	12/15/2004	05/04/2006	2	12/15/2004	05/04/2006	2	10/28/2004	10/03/2007	10	10/28/2004	10/03/2007	10
OW-3S	12/15/2004	12/15/2004	1	12/15/2004	12/15/2004	1	10/28/2004	10/03/2007	9	10/28/2004	10/03/2007	9
OW-5D	12/22/2004	10/17/2007	14	12/22/2004	10/17/2007	14	12/22/2004	10/17/2007	16	12/22/2004	10/17/2007	16
OW-5M	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	16	01/13/2005	10/17/2007	16
OW-5S	12/21/2004	10/17/2007	14	12/21/2004	10/17/2007	14	12/21/2004	10/17/2007	16	12/21/2004	10/17/2007	16
Park Moabi-4	05/02/2007	05/02/2007	1	05/02/2007	05/02/2007	1	05/02/2007	10/04/2007	2			
PE-1							03/21/2005	10/03/2007	24	03/05/2005	10/03/2007	25
PGE-6							07/01/1997	10/12/2005	18	07/01/1997	10/12/2005	18
PGE-7							09/01/1997	10/13/2005	16	09/01/1997	10/13/2005	16
PGE-7BR							12/19/2007	05/08/2008	2	12/19/2007	05/08/2008	2
PGE-8							07/01/1997	08/11/2007	19	07/01/1997	08/11/2007	19
PT-1D							03/17/2006	04/06/2006	2	03/17/2006	04/06/2006	2
PT-1M							03/17/2006	04/06/2006	2	03/17/2006	04/06/2006	2

Table 3-1a. Summary of Groundwater Sampling Events - Metals

Well	Beryllium			Cadmium			Chromium, hexavalent			Chromium, total		
	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PT-1S							03/17/2006	04/06/2006	2	03/17/2006	04/06/2006	2
PT-2D							03/17/2006	04/06/2006	2	03/17/2006	04/06/2006	2
PT-2M							03/17/2006	04/06/2006	2	03/17/2006	04/06/2006	2
PT-2S							03/17/2006	04/06/2006	2	03/17/2006	04/06/2006	2
PT-3D							03/18/2006	04/05/2006	2	03/18/2006	04/05/2006	2
PT-3M							03/18/2006	04/07/2006	2	03/18/2006	04/07/2006	2
PT-3S							03/16/2006	04/03/2006	2	03/16/2006	04/03/2006	2
PT-4D							04/05/2006	04/05/2006	1	03/15/2006	04/05/2006	2
PT-4M							04/07/2006	04/07/2006	1	03/15/2006	04/07/2006	2
PT-4S							04/06/2006	04/06/2006	1	03/15/2006	04/06/2006	2
PT-5D							03/16/2006	04/07/2006	2	03/16/2006	04/07/2006	2
PT-5M							03/16/2006	04/07/2006	2	03/16/2006	04/07/2006	2
PT-5S							03/16/2006	04/07/2006	2	03/16/2006	04/07/2006	2
PT-6D							03/16/2006	04/04/2006	2	03/16/2006	04/04/2006	2
PT-6M							03/16/2006	04/04/2006	2	03/16/2006	04/04/2006	2
PT-6S							03/16/2006	04/04/2006	2	03/18/2006	04/04/2006	2
PT-7D							07/18/2007	07/18/2007	1	07/18/2007	07/18/2007	1
PT-7M							07/19/2007	07/19/2007	1	07/19/2007	07/19/2007	1
PT-7S							07/18/2007	07/18/2007	1	07/18/2007	07/18/2007	1
PT-8D							07/16/2007	07/16/2007	1	07/16/2007	07/16/2007	1
PT-8M							07/18/2007	07/18/2007	1	07/18/2007	07/18/2007	1
PT-8S							07/16/2007	07/16/2007	1	07/16/2007	07/16/2007	1

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Beryllium			Cadmium			Chromium, hexavalent			Chromium, total		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PT-9D							07/17/2007	07/17/2007	1	07/17/2007	07/17/2007	1
PT-9M							07/17/2007	07/17/2007	1	07/17/2007	07/17/2007	1
PT-9S							07/17/2007	07/17/2007	1	07/17/2007	07/17/2007	1
PTI-1D							04/03/2006	04/03/2006	1	03/15/2006	04/03/2006	2
PTI-1M							04/04/2006	04/04/2006	1	03/15/2006	04/04/2006	2
PTI-1S							04/05/2006	04/05/2006	1	03/15/2006	04/05/2006	2
PTR-1							07/19/2007	07/19/2007	1	07/19/2007	07/19/2007	1
PTR-2							07/18/2007	07/18/2007	1	07/18/2007	07/18/2007	1
TW-1	12/21/2004	05/08/2008	4	12/21/2004	05/08/2008	4	12/21/2004	10/11/2007	3	12/21/2004	05/08/2008	6
TW-2D	07/29/2004	06/15/2005	3	07/29/2004	06/15/2005	3	06/09/2004	10/04/2007	12	06/09/2004	10/04/2007	13
TW-2S	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3	06/09/2004	10/04/2007	10	06/09/2004	10/04/2007	10
TW-3D							01/18/2006	10/03/2007	22	01/18/2006	10/03/2007	22
TW-4							05/18/2006	05/08/2008	6	05/18/2006	05/08/2008	6
TW-5							05/10/2006	10/04/2007	4	05/10/2006	10/04/2007	4
Number of Samples			374			374			2780			2880
Count of Wells Sampled			68			68			167			166

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Cobalt			Copper			Lead			Mercury		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
CW-1D	02/07/2005	10/17/2007	7	02/07/2005	10/17/2007	8	02/07/2005	10/17/2007	8	02/07/2005	10/17/2007	7
CW-1M	02/08/2005	10/17/2007	7	02/08/2005	10/17/2007	8	02/08/2005	10/17/2007	8	02/08/2005	10/17/2007	7
CW-2D	02/08/2005	10/18/2007	7	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	7
CW-2M	02/09/2005	10/18/2007	7	02/09/2005	10/18/2007	8	02/09/2005	10/18/2007	8	02/09/2005	10/18/2007	7
CW-3D	02/08/2005	10/18/2007	7	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	7
CW-3M	02/10/2005	10/18/2007	7	02/10/2005	10/18/2007	8	02/10/2005	10/18/2007	8	02/10/2005	10/18/2007	7
CW-4D	02/07/2005	10/18/2007	7	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	7
CW-4M	02/07/2005	10/18/2007	7	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	7
MW-1	05/09/2005	07/18/2005	2	09/01/1997	07/18/2005	5	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2
MW-10	09/21/2004	03/11/2008	14	07/01/1997	03/11/2008	39	07/01/1997	03/11/2008	17	06/10/2004	03/11/2008	15
MW-11	09/21/2004	10/12/2006	9	07/01/1997	05/03/2007	35	07/01/1997	05/03/2007	13	06/10/2004	10/12/2006	10
MW-12	06/09/2004	05/05/2008	17	07/01/1997	05/05/2008	41	07/01/1997	05/05/2008	20	06/09/2004	05/05/2008	17
MW-13	12/13/2005	05/02/2006	2	07/01/1997	05/02/2006	27	07/01/1997	05/02/2006	5	12/13/2005	05/02/2006	2
MW-14	05/11/2005	05/02/2006	2	07/01/1997	05/02/2006	26	07/01/1997	05/02/2006	6	05/11/2005	05/02/2006	2
MW-15				07/01/1997	05/04/2007	24	07/01/1997	05/04/2007	4			
MW-19	05/02/2006	05/02/2006	1	06/15/1998	05/02/2006	22	09/01/2000	05/02/2006	3	05/02/2006	05/02/2006	1
MW-20-100	10/10/2007	10/10/2007	1	06/15/1999	10/10/2007	23	06/15/1999	10/10/2007	4	10/10/2007	10/10/2007	1
MW-20-130	09/24/2004	05/03/2007	12	06/15/1999	05/03/2007	34	06/15/1999	05/03/2007	15	09/24/2004	05/03/2007	12
MW-20-70	09/24/2004	10/11/2007	13	06/15/1998	10/11/2007	36	06/15/1999	10/11/2007	16	09/24/2004	10/11/2007	13
MW-21	12/14/2005	05/06/2008	4	06/15/1999	05/06/2008	25	09/01/2000	05/06/2008	6	12/14/2005	05/06/2008	4
MW-22	12/17/2007	07/29/2008	3	06/15/1998	07/29/2008	27	09/01/2000	07/29/2008	5	12/17/2007	07/29/2008	3
MW-23	12/11/2007	05/06/2008	4	06/15/1998	05/06/2008	26	09/01/2000	05/06/2008	6	12/11/2007	05/06/2008	4

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Cobalt			Copper			Lead			Mercury		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-24A	12/12/2007	05/08/2008	3	06/15/1998	05/08/2008	25	09/01/2000	05/08/2008	5	12/12/2007	05/08/2008	3
MW-24B	05/04/2006	05/04/2006	1	06/15/1998	05/04/2006	23	09/01/2000	05/04/2006	3	05/04/2006	05/04/2006	1
MW-24BR				06/15/1998	06/08/2004	22	09/01/2000	11/29/2001	2			
MW-25	06/09/2004	03/06/2007	10	06/15/1999	03/06/2007	29	06/15/1999	03/06/2007	13	06/09/2004	03/06/2007	10
MW-26	12/11/2007	05/05/2008	3	06/09/1999	05/05/2008	25	06/09/1999	05/05/2008	6	03/12/2007	05/05/2008	4
MW-27-20				06/15/1999	06/08/2004	22	06/15/1999	11/29/2001	3			
MW-27-60												
MW-27-85												
MW-28-25				06/15/1999	06/07/2004	21	06/15/1999	11/29/2001	3			
MW-28-90												
MW-29				06/15/1999	06/09/2004	22	06/15/1999	11/30/2001	3			
MW-3	05/09/2005	07/18/2005	2	09/01/1997	07/18/2005	5	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2
MW-30-30	10/08/2007	10/08/2007	1	06/15/1999	10/08/2007	22	06/15/1999	10/08/2007	4	10/08/2007	10/08/2007	1
MW-30-50				03/19/2003	06/09/2004	6						
MW-31-135				05/01/2007	05/01/2007	1	05/01/2007	05/01/2007	1			
MW-31-60	03/09/2005	10/06/2005	2	06/15/1999	10/06/2005	23	06/15/1999	10/06/2005	5	03/09/2005	03/12/2007	3
MW-32-20				03/19/2003	06/07/2004	6						
MW-32-35	12/10/2007	05/06/2008	3	03/19/2003	05/06/2008	9	12/10/2007	05/06/2008	3	12/10/2007	05/06/2008	3
MW-33-150												
MW-33-210	05/05/2006	05/05/2006	1	05/05/2006	05/05/2006	1	05/05/2006	05/05/2006	1	05/05/2006	05/05/2006	1
MW-33-40				03/19/2003	06/09/2004	6						
MW-33-90	05/03/2006	05/03/2006	1	03/19/2003	05/03/2006	6	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Cobalt			Copper			Lead			Mercury		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-34-100	05/03/2006	05/03/2006	1	05/03/2006	04/30/2007	2	05/03/2006	04/30/2007	2	06/21/2005	05/03/2006	2
MW-34-55	06/08/2004	10/04/2006	9	06/16/2003	10/04/2006	14	06/08/2004	10/04/2006	9	06/08/2004	10/04/2006	10
MW-34-80	06/08/2004	04/30/2007	13	06/16/2003	04/30/2007	18	06/08/2004	04/30/2007	13	06/08/2004	04/30/2007	13
MW-35-135	05/02/2006	05/02/2006	1	05/02/2006	05/04/2007	2	05/02/2006	05/04/2007	2	05/02/2006	05/02/2006	1
MW-35-60	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1
MW-36-100												
MW-36-20												
MW-36-40												
MW-36-50												
MW-36-70												
MW-36-90												
MW-37D	06/11/2004	05/03/2007	13	06/11/2004	05/03/2007	13	06/11/2004	05/03/2007	13	06/11/2004	05/03/2007	13
MW-37S	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1
MW-38D				05/03/2007	05/03/2007	1	05/03/2007	05/03/2007	1			
MW-38S	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1
MW-39-100												
MW-39-40												
MW-39-50												
MW-39-60	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1
MW-39-70												
MW-39-80												
MW-4	05/09/2005	07/18/2005	2	09/01/1997	07/18/2005	5	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Cobalt			Copper			Lead			Mercury		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-40D				05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1			
MW-40S	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1
MW-41D												
MW-41M												
MW-41S												
MW-42-30												
MW-42-55												
MW-42-65												
MW-43-25	12/10/2007	05/07/2008	3	12/10/2007	05/07/2008	3	12/10/2007	05/07/2008	3	12/10/2007	05/07/2008	3
MW-43-75												
MW-43-90												
MW-44-115	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-44-125				05/03/2007	05/03/2007	1	05/03/2007	05/03/2007	1			
MW-44-70												
MW-45-095a				05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1			
MW-46-175				05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1			
MW-46-205												
MW-47-115												
MW-47-55				05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1			
MW-48	12/14/2007	05/07/2008	3	12/14/2007	05/07/2008	3	12/14/2007	05/07/2008	3	12/14/2007	05/07/2008	3
MW-49-135												
MW-49-275												

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Cobalt			Copper			Lead			Mercury		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-49-365												
MW-5	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	5	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-50-095												
MW-50-200	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-51	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-52D												
MW-52M												
MW-52S												
MW-53D												
MW-53M												
MW-54-140												
MW-54-195												
MW-54-85												
MW-55-120												
MW-55-45												
MW-56D												
MW-56M												
MW-56S												
MW-6	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	5	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-7	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	5	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-8	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	5	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-9	12/17/2004	12/17/2004	1	07/01/1997	05/03/2007	27	07/01/1997	05/03/2007	5	12/17/2004	12/17/2004	1

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Cobalt			Copper			Lead			Mercury		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MWP-12												
OW-1D	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	15
OW-1M	12/21/2004	10/16/2007	14	10/01/2004	10/16/2007	15	10/01/2004	10/16/2007	15	12/21/2004	10/16/2007	14
OW-1S	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	13
OW-2D	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14
OW-2M	05/11/2005	10/16/2007	13	05/11/2005	10/16/2007	13	05/11/2005	10/16/2007	13	05/11/2005	10/16/2007	13
OW-2S	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	13
OW-3D	12/14/2004	12/14/2004	1	10/28/2004	12/14/2004	2	10/28/2004	12/14/2004	2	12/14/2004	12/14/2004	1
OW-3M	12/15/2004	05/04/2006	2	10/28/2004	05/01/2007	4	10/28/2004	05/01/2007	4	12/15/2004	05/04/2006	2
OW-3S	12/15/2004	12/15/2004	1	10/28/2004	04/30/2007	3	10/28/2004	04/30/2007	3	12/15/2004	12/15/2004	1
OW-5D	12/22/2004	10/17/2007	14	12/22/2004	10/17/2007	14	12/22/2004	10/17/2007	14	12/22/2004	10/17/2007	14
OW-5M	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14
OW-5S	12/21/2004	10/17/2007	14	12/21/2004	10/17/2007	14	12/21/2004	10/17/2007	14	12/21/2004	10/17/2007	14
Park Moabi-4	05/02/2007	05/02/2007	1	05/02/2007	05/02/2007	1	05/02/2007	05/02/2007	1	05/02/2007	05/02/2007	1
PE-1												
PGE-6				07/01/1997	12/09/2003	17	07/01/1997	11/29/2001	3			
PGE-7				09/01/1997	12/10/2003	15	09/01/2000	11/29/2001	2			
PGE-7BR												
PGE-8				07/01/1997	12/09/2003	17	07/01/1997	11/29/2001	3			
PT-1D												
PT-1M												

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Cobalt			Copper			Lead			Mercury		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PT-1S												
PT-2D												
PT-2M												
PT-2S												
PT-3D												
PT-3M												
PT-3S												
PT-4D												
PT-4M												
PT-4S												
PT-5D												
PT-5M												
PT-5S												
PT-6D												
PT-6M												
PT-6S												
PT-7D												
PT-7M												
PT-7S												
PT-8D												
PT-8M												
PT-8S												

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Cobalt			Copper			Lead			Mercury		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PT-9D												
PT-9M												
PT-9S												
PTI-1D												
PTI-1M												
PTI-1S												
PTR-1												
PTR-2												
TW-1	12/21/2004	05/08/2008	4	12/21/2004	05/08/2008	4	12/21/2004	05/08/2008	4	12/21/2004	05/08/2008	4
TW-2D	07/29/2004	06/15/2005	3	07/29/2004	06/15/2005	3	07/29/2004	06/15/2005	3	07/29/2004	06/15/2005	3
TW-2S	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3
TW-3D												
TW-4												
TW-5												
Number of Samples			374			1049			474			380
Count of Wells Sampled			68			86			83			68

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Molybdenum			Nickel			Selenium			Silver		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
CW-1D	02/07/2005	10/17/2007	8	02/07/2005	10/17/2007	8	02/07/2005	10/17/2007	8	02/07/2005	10/17/2007	7
CW-1M	02/08/2005	10/17/2007	8	02/08/2005	10/17/2007	8	02/08/2005	10/17/2007	8	02/08/2005	10/17/2007	7
CW-2D	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	7
CW-2M	02/09/2005	10/18/2007	8	02/09/2005	10/18/2007	8	02/09/2005	10/18/2007	8	02/09/2005	10/18/2007	7
CW-3D	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	8	02/08/2005	10/18/2007	7
CW-3M	02/10/2005	10/18/2007	8	02/10/2005	10/18/2007	8	02/10/2005	10/18/2007	8	02/10/2005	10/18/2007	7
CW-4D	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	7
CW-4M	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	8	02/07/2005	10/18/2007	7
MW-1	11/10/1998	07/18/2005	12	09/01/1997	07/18/2005	5	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2
MW-10	07/01/1997	03/11/2008	17	07/01/1997	03/11/2008	39	09/21/2004	03/11/2008	14	09/21/2004	03/11/2008	14
MW-11	07/01/1997	05/03/2007	13	07/01/1997	05/03/2007	35	09/21/2004	05/03/2007	10	09/21/2004	10/12/2006	9
MW-12	07/01/1997	05/05/2008	20	07/01/1997	05/05/2008	41	06/09/2004	05/05/2008	17	06/09/2004	05/05/2008	17
MW-13	07/01/1997	05/02/2006	5	07/01/1997	05/02/2006	27	12/13/2005	05/02/2006	2	12/13/2005	05/02/2006	2
MW-14	07/01/1997	05/02/2006	6	07/01/1997	05/02/2006	26	05/11/2005	05/02/2006	2	05/11/2005	05/02/2006	2
MW-15	07/01/1997	05/04/2007	4	07/01/1997	05/04/2007	24	05/04/2007	05/04/2007	1			
MW-19	09/01/2000	05/02/2006	3	06/15/1998	05/02/2006	22	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1
MW-20-100	06/15/1999	10/10/2007	4	06/15/1999	10/10/2007	23	10/10/2007	10/10/2007	1	10/10/2007	10/10/2007	1
MW-20-130	06/15/1999	05/03/2007	15	06/15/1999	05/03/2007	34	09/24/2004	05/03/2007	12	09/24/2004	05/03/2007	12
MW-20-70	06/15/1999	10/11/2007	16	06/15/1998	10/11/2007	36	09/24/2004	10/11/2007	13	09/24/2004	10/11/2007	13
MW-21	09/01/2000	05/06/2008	6	06/15/1999	05/06/2008	25	12/14/2005	05/06/2008	4	12/14/2005	05/06/2008	4
MW-22	09/01/2000	07/29/2008	6	06/15/1998	07/29/2008	27	12/17/2007	07/29/2008	3	12/17/2007	07/29/2008	3
MW-23	09/01/2000	05/06/2008	6	06/15/1998	05/06/2008	26	12/11/2007	05/06/2008	4	12/11/2007	05/06/2008	4

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Molybdenum			Nickel			Selenium			Silver		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-24A	09/01/2000	05/08/2008	5	06/15/1998	05/08/2008	25	12/12/2007	05/08/2008	3	12/12/2007	05/08/2008	3
MW-24B	09/01/2000	05/04/2006	3	06/15/1998	05/04/2006	23	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1
MW-24BR	09/01/2000	11/29/2001	2	06/15/1998	06/08/2004	22						
MW-25	06/15/1999	03/06/2007	13	06/15/1999	03/06/2007	29	06/09/2004	03/06/2007	10	06/09/2004	03/06/2007	10
MW-26	06/09/1999	05/05/2008	6	06/09/1999	05/05/2008	25	12/11/2007	05/05/2008	3	12/11/2007	05/05/2008	3
MW-27-20	06/15/1999	11/29/2001	3	06/15/1999	06/08/2004	22						
MW-27-60												
MW-27-85												
MW-28-25	06/15/1999	11/29/2001	3	06/15/1999	06/07/2004	21						
MW-28-90												
MW-29	06/15/1999	11/30/2001	3	06/15/1999	06/09/2004	22						
MW-3	11/11/1998	07/18/2005	12	09/01/1997	07/18/2005	5	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2
MW-30-30	06/15/1999	10/08/2007	4	06/15/1999	10/08/2007	22	10/08/2007	10/08/2007	1	10/08/2007	10/08/2007	1
MW-30-50				03/19/2003	06/09/2004	6						
MW-31-135	05/01/2007	05/01/2007	1	05/01/2007	05/01/2007	1	05/01/2007	05/01/2007	1			
MW-31-60	06/15/1999	10/06/2005	5	06/15/1999	10/06/2005	23	03/09/2005	10/06/2005	2	03/09/2005	10/06/2005	2
MW-32-20				03/19/2003	06/07/2004	6						
MW-32-35	12/10/2007	05/06/2008	3	03/19/2003	05/06/2008	9	12/10/2007	05/06/2008	3	12/10/2007	05/06/2008	3
MW-33-150												
MW-33-210	05/05/2006	05/05/2006	1	05/05/2006	05/05/2006	1	05/05/2006	05/05/2006	1	05/05/2006	05/05/2006	1
MW-33-40				03/19/2003	06/09/2004	6						
MW-33-90	05/03/2006	05/03/2006	1	03/19/2003	05/03/2006	6	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Molybdenum			Nickel			Selenium			Silver		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-34-100	05/03/2006	04/30/2007	2	05/03/2006	04/30/2007	2	05/03/2006	04/30/2007	2	05/03/2006	05/03/2006	1
MW-34-55	06/08/2004	10/04/2006	9	06/16/2003	10/04/2006	14	06/08/2004	10/04/2006	9	06/08/2004	10/04/2006	9
MW-34-80	06/08/2004	04/30/2007	13	06/16/2003	04/30/2007	18	06/08/2004	04/30/2007	13	06/08/2004	04/30/2007	13
MW-35-135	05/02/2006	05/04/2007	2	05/02/2006	05/04/2007	2	05/02/2006	05/04/2007	2	05/02/2006	05/02/2006	1
MW-35-60	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1
MW-36-100												
MW-36-20												
MW-36-40												
MW-36-50												
MW-36-70												
MW-36-90												
MW-37D	06/11/2004	05/03/2007	13	06/11/2004	05/03/2007	13	06/11/2004	05/03/2007	13	06/11/2004	05/03/2007	13
MW-37S	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1
MW-38D	05/03/2007	05/03/2007	1	05/03/2007	05/03/2007	1	05/03/2007	05/03/2007	1			
MW-38S	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1
MW-39-100												
MW-39-40												
MW-39-50												
MW-39-60	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1
MW-39-70												
MW-39-80												
MW-4	11/10/1998	07/18/2005	12	09/01/1997	07/18/2005	5	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Molybdenum			Nickel			Selenium			Silver		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-40D	05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1			
MW-40S	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1
MW-41D												
MW-41M												
MW-41S												
MW-42-30												
MW-42-55												
MW-42-65												
MW-43-25	12/10/2007	05/07/2008	3	12/10/2007	05/07/2008	3	12/10/2007	05/07/2008	3	12/10/2007	05/07/2008	3
MW-43-75												
MW-43-90												
MW-44-115	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-44-125	05/03/2007	05/03/2007	1	05/03/2007	05/03/2007	1	05/03/2007	05/03/2007	1			
MW-44-70												
MW-45-095a	05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1			
MW-46-175	05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1			
MW-46-205												
MW-47-115												
MW-47-55	05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1			
MW-48	12/14/2007	05/07/2008	3	12/14/2007	05/07/2008	3	12/14/2007	05/07/2008	3	12/14/2007	05/07/2008	3
MW-49-135												
MW-49-275												

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Molybdenum			Nickel			Selenium			Silver		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-49-365												
MW-5	11/11/1998	07/18/2005	12	09/01/1997	07/18/2005	5	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-50-095												
MW-50-200	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-51	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-52D												
MW-52M												
MW-52S												
MW-53D												
MW-53M												
MW-54-140												
MW-54-195												
MW-54-85												
MW-55-120												
MW-55-45												
MW-56D												
MW-56M												
MW-56S												
MW-6	11/10/1998	07/18/2005	12	09/01/1997	07/18/2005	5	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-7	11/10/1998	07/18/2005	12	09/01/1997	07/18/2005	5	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-8	11/11/1998	07/18/2005	12	09/01/1997	07/18/2005	5	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-9	07/01/1997	05/03/2007	5	07/01/1997	05/03/2007	27	12/17/2004	05/03/2007	2	12/17/2004	12/17/2004	1

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Molybdenum			Nickel			Selenium			Silver		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MWP-12												
OW-1D	09/30/2004	10/16/2007	17	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	15
OW-1M	10/01/2004	10/16/2007	17	10/01/2004	10/16/2007	15	12/21/2004	10/16/2007	14	12/21/2004	10/16/2007	14
OW-1S	12/21/2004	10/16/2007	15	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	13
OW-2D	01/13/2005	10/17/2007	16	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14
OW-2M	05/11/2005	10/16/2007	15	05/11/2005	10/16/2007	13	05/11/2005	10/16/2007	13	05/11/2005	10/16/2007	13
OW-2S	12/29/2004	10/17/2007	15	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	13
OW-3D	10/28/2004	12/14/2004	2	10/28/2004	12/14/2004	2	12/14/2004	12/14/2004	1	12/14/2004	12/14/2004	1
OW-3M	10/28/2004	05/01/2007	4	10/28/2004	05/01/2007	4	12/15/2004	05/01/2007	3	12/15/2004	05/04/2006	2
OW-3S	10/28/2004	04/30/2007	3	10/28/2004	04/30/2007	3	12/15/2004	04/30/2007	2	12/15/2004	12/15/2004	1
OW-5D	12/22/2004	10/17/2007	16	12/22/2004	10/17/2007	14	12/22/2004	10/17/2007	14	12/22/2004	10/17/2007	14
OW-5M	01/13/2005	10/17/2007	16	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14
OW-5S	12/21/2004	10/17/2007	16	12/21/2004	10/17/2007	14	12/21/2004	10/17/2007	14	12/21/2004	10/17/2007	14
Park Moabi-4	05/02/2007	05/02/2007	1	05/02/2007	05/02/2007	1	05/02/2007	05/02/2007	1	05/02/2007	05/02/2007	1
PE-1												
PGE-6	07/01/1997	11/29/2001	3	07/01/1997	12/09/2003	17						
PGE-7	09/01/2000	11/29/2001	2	09/01/1997	12/10/2003	15						
PGE-7BR												
PGE-8	07/01/1997	11/29/2001	3	07/01/1997	12/09/2003	17						
PT-1D												
PT-1M												

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Molybdenum			Nickel			Selenium			Silver		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PT-1S												
PT-2D												
PT-2M												
PT-2S												
PT-3D												
PT-3M												
PT-3S												
PT-4D												
PT-4M												
PT-4S												
PT-5D												
PT-5M												
PT-5S												
PT-6D												
PT-6M												
PT-6S												
PT-7D												
PT-7M												
PT-7S												
PT-8D												
PT-8M												
PT-8S												

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Molybdenum			Nickel			Selenium			Silver		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PT-9D												
PT-9M												
PT-9S												
PTI-1D												
PTI-1M												
PTI-1S												
PTR-1												
PTR-2												
TW-1	12/21/2004	05/08/2008	4	12/21/2004	05/08/2008	4	12/21/2004	05/08/2008	4	12/21/2004	05/08/2008	4
TW-2D	07/29/2004	06/15/2005	3	07/29/2004	06/15/2005	3	07/29/2004	06/15/2005	3	07/29/2004	06/15/2005	3
TW-2S	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3
TW-3D												
TW-4												
TW-5												
Number of Samples			563			1049			396			374
Count of Wells Sampled			83			86			76			68

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Thallium			Vanadium			Zinc		
Well	First	Last	No.	First	Last	No.	First	Last	No.
CW-1D	02/07/2005	10/17/2007	7	02/07/2005	10/17/2007	7	02/07/2005	10/17/2007	8
CW-1M	02/08/2005	10/17/2007	7	02/08/2005	10/17/2007	7	02/08/2005	10/17/2007	8
CW-2D	02/08/2005	10/18/2007	7	02/08/2005	10/18/2007	7	02/08/2005	10/18/2007	8
CW-2M	02/09/2005	10/18/2007	7	02/09/2005	10/18/2007	7	02/09/2005	10/18/2007	8
CW-3D	02/08/2005	10/18/2007	7	02/08/2005	10/18/2007	7	02/08/2005	10/18/2007	8
CW-3M	02/10/2005	10/18/2007	7	02/10/2005	10/18/2007	7	02/10/2005	10/18/2007	8
CW-4D	02/07/2005	10/18/2007	7	02/07/2005	10/18/2007	7	02/07/2005	10/18/2007	8
CW-4M	02/07/2005	10/18/2007	7	02/07/2005	10/18/2007	7	02/07/2005	10/18/2007	8
MW-1	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	09/01/1997	07/18/2005	5
MW-10	09/21/2004	03/11/2008	14	07/01/1997	03/11/2008	17	07/01/1997	03/11/2008	39
MW-11	09/21/2004	10/12/2006	9	07/01/1997	05/03/2007	13	07/01/1997	05/03/2007	35
MW-12	06/09/2004	05/05/2008	17	07/01/1997	05/05/2008	20	07/01/1997	05/05/2008	41
MW-13	12/13/2005	05/02/2006	2	07/01/1997	05/02/2006	5	07/01/1997	05/02/2006	27
MW-14	05/11/2005	05/02/2006	2	07/01/1997	05/02/2006	5	07/01/1997	05/02/2006	26
MW-15				07/01/1997	05/04/2007	4	07/01/1997	05/04/2007	24
MW-19	05/02/2006	05/02/2006	1	09/01/2000	05/02/2006	3	06/15/1998	05/02/2006	22
MW-20-100	10/10/2007	10/10/2007	1	06/15/1999	10/10/2007	4	06/15/1999	10/10/2007	23
MW-20-130	09/24/2004	05/03/2007	12	06/15/1999	05/03/2007	15	06/15/1999	05/03/2007	34
MW-20-70	09/24/2004	10/11/2007	13	06/15/1999	10/11/2007	16	06/15/1998	10/11/2007	36
MW-21	12/14/2005	05/06/2008	4	09/01/2000	05/06/2008	6	06/15/1999	05/06/2008	25
MW-22	12/17/2007	07/29/2008	3	09/01/2000	07/29/2008	6	06/15/1998	07/29/2008	27
MW-23	12/11/2007	05/06/2008	4	09/01/2000	05/06/2008	6	06/15/1998	05/06/2008	26

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Thallium			Vanadium			Zinc		
Well	First	Last	No.	First	Last	No.	First	Last	No.
MW-24A	12/12/2007	05/08/2008	3	09/01/2000	05/08/2008	5	06/15/1998	05/08/2008	25
MW-24B	05/04/2006	05/04/2006	1	09/01/2000	05/04/2006	3	06/15/1998	05/04/2006	23
MW-24BR				09/01/2000	11/29/2001	2	06/15/1998	06/08/2004	22
MW-25	06/09/2004	03/06/2007	10	06/15/1999	03/06/2007	13	06/15/1999	03/06/2007	29
MW-26	12/11/2007	05/05/2008	3	06/09/1999	05/05/2008	6	06/09/1999	05/05/2008	25
MW-27-20				06/15/1999	11/29/2001	3	06/15/1999	06/08/2004	22
MW-27-60									
MW-27-85									
MW-28-25				06/15/1999	11/29/2001	3	06/15/1999	06/07/2004	21
MW-28-90									
MW-29				06/15/1999	11/30/2001	3	06/15/1999	06/09/2004	22
MW-3	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	09/01/1997	07/18/2005	5
MW-30-30	10/08/2007	10/08/2007	1	06/15/1999	10/08/2007	4	06/15/1999	10/08/2007	22
MW-30-50							03/19/2003	06/09/2004	6
MW-31-135				05/01/2007	05/01/2007	1	05/01/2007	05/01/2007	1
MW-31-60	03/09/2005	10/06/2005	2	06/15/1999	10/06/2005	5	06/15/1999	10/06/2005	23
MW-32-20							03/19/2003	06/07/2004	6
MW-32-35	12/10/2007	05/06/2008	3	12/10/2007	05/06/2008	3	03/19/2003	05/06/2008	9
MW-33-150									
MW-33-210	05/05/2006	05/05/2006	1	05/05/2006	05/05/2006	1	05/05/2006	05/05/2006	1
MW-33-40							03/19/2003	06/09/2004	6
MW-33-90	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	03/19/2003	05/03/2006	6

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Thallium			Vanadium			Zinc		
Well	First	Last	No.	First	Last	No.	First	Last	No.
MW-34-100	05/03/2006	05/03/2006	1	05/03/2006	04/30/2007	2	05/03/2006	04/30/2007	2
MW-34-55	06/08/2004	10/04/2006	9	06/08/2004	10/04/2006	9	06/16/2003	10/04/2006	14
MW-34-80	06/08/2004	04/30/2007	13	06/08/2004	04/30/2007	13	06/16/2003	04/30/2007	18
MW-35-135	05/02/2006	05/02/2006	1	05/02/2006	05/04/2007	2	05/02/2006	05/04/2007	2
MW-35-60	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1
MW-36-100									
MW-36-20									
MW-36-40									
MW-36-50									
MW-36-70									
MW-36-90									
MW-37D	06/11/2004	05/03/2007	13	06/11/2004	05/03/2007	13	06/11/2004	05/03/2007	13
MW-37S	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1
MW-38D				05/03/2007	05/03/2007	1	05/03/2007	05/03/2007	1
MW-38S	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1	05/04/2006	05/04/2006	1
MW-39-100									
MW-39-40									
MW-39-50									
MW-39-60	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1	05/02/2006	05/02/2006	1
MW-39-70									
MW-39-80									
MW-4	05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2	09/01/1997	07/18/2005	5

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Thallium			Vanadium			Zinc		
Well	First	Last	No.	First	Last	No.	First	Last	No.
MW-40D				05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1
MW-40S	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1	05/03/2006	05/03/2006	1
MW-41D									
MW-41M									
MW-41S									
MW-42-30									
MW-42-55									
MW-42-65									
MW-43-25	12/10/2007	05/07/2008	3	12/10/2007	05/07/2008	3	12/10/2007	05/07/2008	3
MW-43-75									
MW-43-90									
MW-44-115	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-44-125				05/03/2007	05/03/2007	1	05/03/2007	05/03/2007	1
MW-44-70									
MW-45-095a				05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1
MW-46-175				05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1
MW-46-205									
MW-47-115									
MW-47-55				05/04/2007	05/04/2007	1	05/04/2007	05/04/2007	1
MW-48	12/14/2007	05/07/2008	3	12/14/2007	05/07/2008	3	12/14/2007	05/07/2008	3
MW-49-135									
MW-49-275									

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Thallium			Vanadium			Zinc		
Well	First	Last	No.	First	Last	No.	First	Last	No.
MW-49-365									
MW-5	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	5
MW-50-095									
MW-50-200	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-51	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3	12/11/2007	05/08/2008	3
MW-52D									
MW-52M									
MW-52S									
MW-53D									
MW-53M									
MW-54-140									
MW-54-195									
MW-54-85									
MW-55-120									
MW-55-45									
MW-56D									
MW-56M									
MW-56S									
MW-6	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	5
MW-7	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	5
MW-8	05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2	09/01/1997	07/18/2005	5
MW-9	12/17/2004	12/17/2004	1	07/01/1997	05/03/2007	5	07/01/1997	05/03/2007	27

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Thallium			Vanadium			Zinc		
Well	First	Last	No.	First	Last	No.	First	Last	No.
MWP-12									
OW-1D	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	15	09/30/2004	10/16/2007	15
OW-1M	12/21/2004	10/16/2007	14	12/21/2004	10/16/2007	14	10/01/2004	10/16/2007	15
OW-1S	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	13	12/21/2004	10/16/2007	13
OW-2D	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14
OW-2M	05/11/2005	10/16/2007	13	05/11/2005	10/16/2007	13	05/11/2005	10/16/2007	13
OW-2S	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	13	12/29/2004	10/17/2007	13
OW-3D	12/14/2004	12/14/2004	1	12/14/2004	12/14/2004	1	10/28/2004	12/14/2004	2
OW-3M	12/15/2004	05/04/2006	2	12/15/2004	05/01/2007	3	10/28/2004	05/01/2007	4
OW-3S	12/15/2004	12/15/2004	1	12/15/2004	04/30/2007	2	10/28/2004	04/30/2007	3
OW-5D	12/22/2004	10/17/2007	14	12/22/2004	10/17/2007	14	12/22/2004	10/17/2007	14
OW-5M	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14	01/13/2005	10/17/2007	14
OW-5S	12/21/2004	10/17/2007	14	12/21/2004	10/17/2007	14	12/21/2004	10/17/2007	14
Park Moabi-4	05/02/2007	05/02/2007	1	05/02/2007	05/02/2007	1	05/02/2007	05/02/2007	1
PE-1									
PGE-6				07/01/1997	11/29/2001	3	07/01/1997	12/09/2003	17
PGE-7				09/01/2000	11/29/2001	2	09/01/1997	12/10/2003	15
PGE-7BR									
PGE-8				07/01/1997	11/29/2001	3	07/01/1997	12/09/2003	17
PT-1D									
PT-1M									

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Thallium			Vanadium			Zinc		
Well	First	Last	No.	First	Last	No.	First	Last	No.
PT-1S									
PT-2D									
PT-2M									
PT-2S									
PT-3D									
PT-3M									
PT-3S									
PT-4D									
PT-4M									
PT-4S									
PT-5D									
PT-5M									
PT-5S									
PT-6D									
PT-6M									
PT-6S									
PT-7D									
PT-7M									
PT-7S									
PT-8D									
PT-8M									
PT-8S									

Table 3-1a. Summary of Groundwater Sampling Events - Metals

	Thallium			Vanadium			Zinc		
Well	First	Last	No.	First	Last	No.	First	Last	No.
PT-9D									
PT-9M									
PT-9S									
PTI-1D									
PTI-1M									
PTI-1S									
PTR-1									
PTR-2									
TW-1	12/21/2004	05/08/2008	4	12/21/2004	05/08/2008	4	12/21/2004	05/08/2008	4
TW-2D	07/29/2004	06/15/2005	3	07/29/2004	06/15/2005	3	07/29/2004	06/15/2005	3
TW-2S	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3	07/29/2004	06/16/2005	3
TW-3D									
TW-4									
TW-5									
Number of Samples			374			462			1049
Count of Wells Sampled			68			83			86

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Other Inorganic Compounds			PAHs			PCBs			Perchlorate			Radiological Compounds		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
CW-1D	02/07/2005	10/17/2007	96												
CW-1M	02/08/2005	10/17/2007	96												
CW-2D	02/08/2005	10/18/2007	96	02/23/2005	02/23/2005	14									
CW-2M	02/09/2005	10/18/2007	96												
CW-3D	02/08/2005	10/18/2007	96												
CW-3M	02/10/2005	10/18/2007	97												
CW-4D	02/07/2005	10/18/2007	96												
CW-4M	02/07/2005	10/18/2007	97												
MW-1	07/26/1997	07/18/2005	36							05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2
MW-10	07/01/1997	10/02/2007	112	06/10/2004	05/03/2007	28	07/29/2004	07/29/2004	9						
MW-11	07/01/1997	07/17/2007	114	06/10/2004	05/03/2007	28	07/29/2004	07/29/2004	9						
MW-12	07/01/1997	10/04/2007	111	06/09/2004	05/03/2007	28	06/09/2004	06/09/2004	9						
MW-13	07/01/1997	10/02/2007	91										07/29/2004	07/29/2004	5
MW-14	07/01/1997	10/02/2007	97												
MW-15	07/01/1997	10/02/2007	90												
MW-19	06/15/1998	10/05/2007	88												
MW-20-100	06/15/1999	10/10/2007	180	05/03/2007	05/03/2007	14				06/11/2003	06/11/2003	1			
MW-20-130	06/15/1999	10/05/2007	191	05/03/2007	05/03/2007	14				06/11/2003	06/11/2003	1			
MW-20-70	06/15/1998	10/11/2007	204	05/03/2007	05/03/2007	14				06/11/2003	06/11/2003	1			
MW-21	09/01/2000	10/04/2007	54												
MW-22	06/15/1998	10/10/2007	91												
MW-23	06/15/1998	10/04/2007	76												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Other Inorganic Compounds			PAHs			PCBs			Perchlorate			Radiological Compounds		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-24A	06/15/1998	07/18/2007	81												
MW-24B	06/15/1998	07/18/2007	93												
MW-24BR	06/15/1998	10/04/2007	76												
MW-25	06/15/1999	10/02/2007	170	06/09/2004	05/04/2007	28	06/09/2004	06/09/2004	9	06/12/2003	06/12/2003	1			
MW-26	06/09/1999	10/02/2007	164												
MW-27-20	06/15/1999	10/02/2007	159							06/10/2003	06/08/2004	2			
MW-27-60	02/23/2005	10/02/2007	49												
MW-27-85	02/23/2005	10/02/2007	49												
MW-28-25	06/15/1999	10/04/2007	162							06/07/2004	06/07/2004	1			
MW-28-90	06/10/2004	10/04/2007	51												
MW-29	06/15/1999	10/04/2007	74							06/11/2003	06/09/2004	2			
MW-3	07/26/1997	07/18/2005	35							05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2
MW-30-30	06/15/1999	10/08/2007	148												
MW-30-50	06/10/2003	10/11/2006	103							06/10/2003	06/10/2003	1			
MW-31-135	06/10/2004	10/01/2007	54												
MW-31-60	06/15/1999	10/04/2007	168												
MW-32-20	06/10/2003	10/01/2007	148												
MW-32-35	06/10/2003	10/01/2007	148												
MW-33-150	03/02/2005	10/09/2007	53												
MW-33-210	02/24/2005	10/05/2007	62												
MW-33-40	06/11/2003	10/05/2007	57							06/11/2003	06/11/2003	1			
MW-33-90	06/11/2003	10/05/2007	69												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Other Inorganic Compounds			PAHs			PCBs			Perchlorate			Radiological Compounds		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-34-100	02/23/2005	10/03/2007	92												
MW-34-55	06/16/2003	10/03/2007	139	06/08/2004	06/23/2004	15				06/08/2004	06/08/2004	1			
MW-34-80	06/16/2003	10/03/2007	168	06/08/2004	06/23/2004	15				06/08/2004	06/08/2004	1			
MW-35-135	06/10/2004	10/01/2007	66												
MW-35-60	06/10/2004	10/01/2007	53												
MW-36-100	06/15/2004	10/10/2007	47												
MW-36-20	06/15/2004	10/03/2007	49												
MW-36-40	06/16/2004	10/03/2007	29												
MW-36-50	06/17/2004	10/10/2007	34												
MW-36-70	06/17/2004	10/09/2007	50												
MW-36-90	06/15/2004	10/09/2007	32												
MW-37D	06/11/2004	10/04/2007	61	06/11/2004	06/11/2004	14									
MW-37S	06/10/2004	10/04/2007	41												
MW-38D	06/10/2004	07/17/2007	47												
MW-38S	06/11/2004	07/17/2007	46												
MW-39-100	06/15/2004	10/10/2007	44												
MW-39-40	06/18/2004	10/08/2007	46												
MW-39-50	06/18/2004	10/08/2007	32												
MW-39-60	06/18/2004	10/08/2007	44												
MW-39-70	06/18/2004	10/08/2007	44												
MW-39-80	06/17/2004	10/08/2007	34												
MW-4	07/26/1997	07/18/2005	35							05/09/2005	07/18/2005	2	05/09/2005	07/18/2005	2

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Other Inorganic Compounds			PAHs			PCBs			Perchlorate			Radiological Compounds		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-40D	06/14/2004	10/04/2007	42												
MW-40S	06/15/2004	10/04/2007	41												
MW-41D	12/15/2004	10/03/2007	39												
MW-41M	12/15/2004	10/03/2007	27												
MW-41S	12/16/2004	10/03/2007	39												
MW-42-30	02/23/2005	10/04/2007	51												
MW-42-55	02/23/2005	10/04/2007	51												
MW-42-65	02/24/2005	10/03/2007	51												
MW-43-25	03/07/2005	10/02/2007	46												
MW-43-75	03/07/2005	10/02/2007	46												
MW-43-90	03/07/2005	10/02/2007	46												
MW-44-115	03/14/2006	10/04/2007	16												
MW-44-125	03/22/2006	10/04/2007	29												
MW-44-70	03/23/2006	10/04/2007	16												
MW-45-095a	03/24/2006	05/04/2007	24												
MW-46-175	03/14/2006	10/05/2007	29												
MW-46-205	03/14/2006	10/05/2007	16												
MW-47-115	03/23/2006	10/04/2007	16												
MW-47-55	03/23/2006	10/04/2007	29												
MW-48	05/18/2006	10/04/2007	16												
MW-49-135	04/25/2006	10/10/2007	19												
MW-49-275	04/25/2006	10/09/2007	19												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Other Inorganic Compounds			PAHs			PCBs			Perchlorate			Radiological Compounds		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-49-365	04/26/2006	10/09/2007	19												
MW-5	07/26/1997	07/18/2005	35							05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-50-095	05/09/2006	10/04/2007	16												
MW-50-200	05/09/2006	10/04/2007	16												
MW-51	05/12/2006	10/05/2007	16												
MW-52D	05/01/2007	10/11/2007	28												
MW-52M	05/01/2007	10/11/2007	28												
MW-52S	05/01/2007	10/11/2007	28												
MW-53D	05/02/2007	10/11/2007	28												
MW-53M	05/01/2007	10/11/2007	28												
MW-54-140	04/14/2008	04/14/2008	11												
MW-54-195	04/14/2008	04/14/2008	11												
MW-54-85	04/15/2008	04/15/2008	11												
MW-55-120	04/15/2008	04/15/2008	11												
MW-55-45	04/15/2008	04/15/2008	11												
MW-56D	04/29/2008	04/29/2008	11												
MW-56M	04/29/2008	04/29/2008	11												
MW-56S	04/29/2008	04/29/2008	11												
MW-6	07/26/1997	07/18/2005	35							05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-7	07/26/1997	07/18/2005	35							05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-8	07/26/1997	07/18/2005	35							05/13/2005	07/18/2005	2	05/13/2005	07/18/2005	2
MW-9	07/01/1997	10/04/2007	96												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Other Inorganic Compounds			PAHs			PCBs			Perchlorate			Radiological Compounds		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
OW-1D	09/30/2004	10/16/2007	183	09/30/2004	05/10/2005	28	09/30/2004	09/30/2004	9	09/30/2004	09/30/2004	1			
OW-1M	10/01/2004	10/16/2007	183	05/10/2005	05/10/2005	14									
OW-1S	12/21/2004	10/16/2007	158	07/28/2005	07/28/2005	14									
OW-2D	01/13/2005	10/17/2007	168	05/10/2005	05/10/2005	14									
OW-2M	05/11/2005	10/16/2007	162	05/11/2005	05/11/2005	14									
OW-2S	12/29/2004	10/17/2007	159	07/28/2005	07/28/2005	14									
OW-3D	10/28/2004	10/03/2007	36												
OW-3M	10/28/2004	10/03/2007	59												
OW-3S	10/28/2004	10/03/2007	47												
OW-5D	12/22/2004	10/17/2007	168	05/11/2005	05/11/2005	14									
OW-5M	01/13/2005	10/17/2007	168	05/11/2005	05/11/2005	14									
OW-5S	12/21/2004	10/17/2007	169	05/11/2005	05/11/2005	14									
Park Moabi-4	05/02/2007	10/04/2007	11												
PE-1	03/21/2005	04/05/2006	45												
PGE-6	07/01/1997	11/29/2001	47												
PGE-7	07/17/1998	11/29/2001	35												
PGE-8	07/01/1997	08/11/2007	57												
PT-1D	03/17/2006	04/06/2006	22												
PT-1M	03/17/2006	04/06/2006	22												
PT-1S	03/17/2006	04/06/2006	22												
PT-2D	03/17/2006	04/06/2006	22												
PT-2M	03/17/2006	04/06/2006	22												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Other Inorganic Compounds			PAHs			PCBs			Perchlorate			Radiological Compounds		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PT-2S	03/17/2006	04/06/2006	22												
PT-3D	03/18/2006	04/05/2006	22												
PT-3M	03/18/2006	04/07/2006	22												
PT-3S	03/16/2006	04/03/2006	22												
PT-4D	03/15/2006	04/05/2006	22												
PT-4M	03/15/2006	04/07/2006	22												
PT-4S	03/15/2006	04/06/2006	22												
PT-5D	03/16/2006	04/07/2006	22												
PT-5M	03/16/2006	04/07/2006	22												
PT-5S	03/16/2006	04/07/2006	22												
PT-6D	03/16/2006	04/04/2006	22												
PT-6M	03/16/2006	04/04/2006	22												
PT-6S	03/16/2006	04/04/2006	25												
PT-7D	07/18/2007	07/18/2007	10												
PT-7M	07/19/2007	07/19/2007	10												
PT-7S	07/18/2007	07/18/2007	10												
PT-8D	07/16/2007	07/16/2007	10												
PT-8M	07/18/2007	07/18/2007	10												
PT-8S	07/16/2007	07/16/2007	10												
PT-9D	07/17/2007	07/17/2007	10												
PT-9M	07/17/2007	07/17/2007	10												
PT-9S	07/17/2007	07/17/2007	10												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Other Inorganic Compounds			PAHs			PCBs			Perchlorate			Radiological Compounds		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PTI-1D	03/15/2006	04/03/2006	22												
PTI-1M	03/15/2006	04/04/2006	22												
PTI-1S	03/15/2006	04/05/2006	22												
PTR-1	07/19/2007	07/19/2007	10												
PTR-2	07/18/2007	07/18/2007	10												
TW-1	12/21/2004	10/11/2007	14												
TW-2D	07/29/2004	10/04/2007	60	07/29/2004	07/29/2004	14	07/29/2004	07/29/2004	9	07/29/2004	07/29/2004	1			
TW-2S	07/29/2004	10/04/2007	38	07/29/2004	07/29/2004	14	07/29/2004	07/29/2004	9	07/29/2004	07/29/2004	1			
TW-3D	03/17/2006	04/05/2006	22												
TW-4	05/18/2006	10/03/2007	16												
TW-5	05/10/2006	10/04/2007	16												
Number of Samples			9546			380			63			30			19
Count of Wells Sampled			165			22			7			21			8

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Strontium			SVOCs			TPH			VOCs		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
CW-1D												
CW-1M												
CW-2D				02/23/2005	02/23/2005	32				02/23/2005	02/23/2005	60
CW-2M												
CW-3D												
CW-3M												
CW-4D												
CW-4M												
MW-1												
MW-10	06/16/2005	06/16/2005	1	06/10/2004	05/03/2007	79	05/03/2007	05/03/2007	3	06/10/2004	05/03/2007	139
MW-11	06/16/2005	06/16/2005	1	06/10/2004	05/03/2007	79	05/03/2007	05/03/2007	3	06/10/2004	05/03/2007	139
MW-12	06/13/2005	06/13/2005	1	06/09/2004	05/03/2007	79	05/03/2007	05/03/2007	3	06/09/2004	05/03/2007	139
MW-13												
MW-14												
MW-15												
MW-19												
MW-20-100				05/03/2007	05/03/2007	32				05/03/2007	05/03/2007	63
MW-20-130	06/15/2005	06/15/2005	1	05/03/2007	05/03/2007	32				05/03/2007	05/03/2007	63
MW-20-70	06/15/2008	06/15/2008	2	05/03/2007	05/03/2007	32				05/03/2007	05/03/2007	63
MW-21												
MW-22												
MW-23												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Strontium			SVOCs			TPH			VOCs		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-24A							07/18/2007	07/18/2007	3			
MW-24B												
MW-24BR												
MW-25	06/14/2005	06/14/2005	2	06/09/2004	05/04/2007	79	05/04/2007	05/04/2007	3	06/09/2004	05/04/2007	139
MW-26												
MW-27-20												
MW-27-60												
MW-27-85												
MW-28-25												
MW-28-90												
MW-29												
MW-3												
MW-30-30												
MW-30-50												
MW-31-135												
MW-31-60												
MW-32-20												
MW-32-35												
MW-33-150												
MW-33-210												
MW-33-40												
MW-33-90												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Strontium			SVOCs			TPH			VOCs		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-34-100												
MW-34-55				06/08/2004	06/23/2004	47				06/08/2004	06/23/2004	82
MW-34-80	06/30/2005	06/30/2005	1	06/08/2004	06/23/2004	47				06/08/2004	06/23/2004	82
MW-35-135												
MW-35-60												
MW-36-100												
MW-36-20												
MW-36-40												
MW-36-50												
MW-36-70												
MW-36-90												
MW-37D	06/15/2005	06/15/2005	1	06/11/2004	06/11/2004	47				06/11/2004	06/11/2004	76
MW-37S												
MW-38D												
MW-38S												
MW-39-100												
MW-39-40												
MW-39-50												
MW-39-60												
MW-39-70												
MW-39-80												
MW-4												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Strontium			SVOCs			TPH			VOCs		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-40D												
MW-40S												
MW-41D												
MW-41M												
MW-41S												
MW-42-30												
MW-42-55												
MW-42-65												
MW-43-25												
MW-43-75												
MW-43-90												
MW-44-115												
MW-44-125												
MW-44-70												
MW-45-095a												
MW-46-175												
MW-46-205												
MW-47-115												
MW-47-55												
MW-48												
MW-49-135												
MW-49-275												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Strontium			SVOCs			TPH			VOCs		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
MW-49-365												
MW-5												
MW-50-095												
MW-50-200												
MW-51												
MW-52D												
MW-52M												
MW-52S												
MW-53D												
MW-53M												
MW-54-140												
MW-54-195												
MW-54-85												
MW-55-120												
MW-55-45												
MW-56D												
MW-56M												
MW-56S												
MW-6												
MW-7												
MW-8												
MW-9												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Strontium			SVOCs			TPH			VOCs		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
OW-1D				09/30/2004	05/10/2005	78				09/30/2004	05/10/2005	138
OW-1M				05/10/2005	05/10/2005	32				05/10/2005	05/10/2005	62
OW-1S				07/28/2005	07/28/2005	32				07/28/2005	07/28/2005	61
OW-2D				05/10/2005	05/10/2005	32				05/10/2005	05/10/2005	62
OW-2M				05/11/2005	05/11/2005	32				05/11/2005	05/11/2005	62
OW-2S				07/28/2005	07/28/2005	32				07/28/2005	07/28/2005	61
OW-3D												
OW-3M												
OW-3S												
OW-5D				05/11/2005	05/11/2005	32				05/11/2005	05/11/2005	62
OW-5M				05/11/2005	05/11/2005	32				05/11/2005	05/11/2005	62
OW-5S				05/11/2005	05/11/2005	32				05/11/2005	05/11/2005	62
Park Moabi-4												
PE-1	10/03/2005	10/03/2005	1									
PGE-6												
PGE-7												
PGE-8												
PT-1D												
PT-1M												
PT-1S												
PT-2D												
PT-2M												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Strontium			SVOCs			TPH			VOCs		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PT-2S												
PT-3D												
PT-3M												
PT-3S												
PT-4D												
PT-4M												
PT-4S												
PT-5D												
PT-5M												
PT-5S												
PT-6D												
PT-6M												
PT-6S												
PT-7D												
PT-7M												
PT-7S												
PT-8D												
PT-8M												
PT-8S												
PT-9D												
PT-9M												
PT-9S												

Table 3-1b. Summary of Groundwater Sampling Events - Other Constituents

	Strontium			SVOCs			TPH			VOCs		
Well	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
PTI-1D												
PTI-1M												
PTI-1S												
PTR-1												
PTR-2												
TW-1												
TW-2D	06/15/2005	06/15/2005	1	07/29/2004	07/29/2004	47				07/29/2004	07/29/2004	77
TW-2S	06/16/2005	06/16/2005	1	07/29/2004	07/29/2004	47				07/29/2004	07/29/2004	77
TW-3D												
TW-4												
TW-5												
Number of Samples			13			1013			15			1831
Count of Wells Sampled			11			22			5			22

Notes:
(1) See Table 3-4b for a breakdown of analytes per group.

PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
SVOCs = semivolatile organic compounds
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-2. Summary of Surface Water Sampling Events

	Alkalinity, bicarb as CaCO3			Ammonia as nitrogen			Barium			Calcium		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
C-MAR	03/13/2007	03/13/2007	2									
C-I-3	03/13/2007	03/13/2007	3									
C-R22	03/13/2007	03/13/2007	3									
C-R27	03/13/2007	03/13/2007	3									
C-TAZ	03/13/2007	03/13/2007	3									
I-3	07/01/1997	06/10/2004	6	07/01/1997	06/10/2004	6	07/01/1997	06/10/2004	6	07/01/1997	06/10/2004	6
R-19												
R-19-B												
R-19-C												
R-20												
R-20-B												
R-20-C												
R-22												
R-27	06/10/2003	05/08/2007	15	06/10/2003	03/06/2006	5	06/10/2003	06/10/2003	1	06/10/2003	09/11/2007	16
R-28	06/10/2003	05/09/2007	15	06/10/2003	03/06/2006	5	06/10/2003	06/10/2003	1	06/10/2003	09/12/2007	16
RRB	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1
Seasonal Wetlands	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1
SW-10B												
SW-11B												
SW-12B												
SW-13B												
SW-14B												

Table 3-2. Summary of Surface Water Sampling Events

	Alkalinity, bicarb as CaCO3			Ammonia as nitrogen			Barium			Calcium		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
SW-15B												
SW-16B												
SW-8B												
SW-9B												
A-Dock	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1
C-CON												
C-NR1												
C-NR3												
C-NR4												
CON	07/01/1997	06/11/2003	4	07/01/1997	06/11/2003	4	07/01/1997	06/11/2003	4	07/01/1997	06/11/2003	4
Needles Gauge												
NR-1	06/11/2004	06/11/2004	1	06/11/2004	06/11/2004	1	06/11/2004	06/11/2004	1	06/11/2004	06/11/2004	1
NR-2												
NR-3												
SW-1B												
SW-2B												
SW-3B												
SW-4B												
SW-5B												
SW-6B												
SW-7B												

Table 3-2. Summary of Surface Water Sampling Events

	Alkalinity, bicarb as CaCO3			Ammonia as nitrogen			Barium			Calcium		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
Number of Samples			58			24			16			46
Count of Locations Sampled			13			8			8			8

Table 3-2. Summary of Surface Water Sampling Events

	Chloride			Chromium, hexavalent			Chromium, total			Copper		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
C-MAR				09/21/2005	10/02/2007	26	09/21/2005	10/02/2007	26			
C-I-3				07/13/2005	10/02/2007	52	07/13/2005	10/02/2007	52			
C-R22				07/13/2005	10/02/2007	59	07/13/2005	10/02/2007	59			
C-R27				07/13/2005	10/02/2007	47	07/13/2005	10/02/2007	47			
C-TAZ				07/13/2005	10/02/2007	49	07/13/2005	10/02/2007	52			
I-3	07/01/1997	06/10/2004	6	07/01/1997	10/02/2007	66	07/01/1997	10/02/2007	67	07/01/1997	06/10/2004	27
R-19				09/04/1998	09/04/1998	1	09/04/1998	09/04/1998	1	09/04/1998	09/04/1998	1
R-19-B				09/04/1998	09/04/1998	2	09/04/1998	09/04/1998	2	09/04/1998	09/04/1998	2
R-19-C				09/04/1998	09/04/1998	2	09/04/1998	09/04/1998	2	09/04/1998	09/04/1998	2
R-20				09/04/1998	09/04/1998	1	09/04/1998	09/04/1998	1	09/04/1998	09/04/1998	1
R-20-B				09/04/1998	09/04/1998	2	09/04/1998	09/04/1998	2	09/04/1998	09/04/1998	2
R-20-C				09/04/1998	09/04/1998	1	09/04/1998	09/04/1998	1	09/04/1998	09/04/1998	1
R-22				07/19/1999	10/02/2007	64	07/19/1999	10/02/2007	65	07/19/1999	06/10/2004	22
R-27	06/10/2003	09/11/2007	16	06/08/1999	10/02/2007	65	06/08/1999	10/02/2007	66	06/08/1999	06/10/2004	22
R-28	06/10/2003	09/12/2007	16	06/08/1999	10/03/2007	62	06/08/1999	10/03/2007	63	06/08/1999	06/10/2004	22
RRB	07/01/1997	07/01/1997	1	07/01/1997	10/03/2007	57	07/01/1997	10/03/2007	58	07/01/1997	06/10/2004	22
Seasonal Wetlands	07/01/1997	07/01/1997	1	07/01/1997	03/25/2000	8	07/01/1997	03/25/2000	8	07/01/1997	03/25/2000	8
SW-10B				01/05/2006	01/05/2006	1	01/05/2006	01/05/2006	1			
SW-11B				01/05/2006	01/05/2006	1	01/05/2006	01/05/2006	1			
SW-12B				01/06/2006	01/06/2006	1	01/06/2006	01/06/2006	1			
SW-13B				01/06/2006	01/06/2006	1	01/06/2006	01/06/2006	1			
SW-14B				01/07/2006	01/07/2006	1	01/07/2006	01/07/2006	1			

Table 3-2. Summary of Surface Water Sampling Events

	Chloride			Chromium, hexavalent			Chromium, total			Copper		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
SW-15B				01/07/2006	01/07/2006	1	01/07/2006	01/07/2006	1			
SW-16B				01/07/2006	01/07/2006	1	01/07/2006	01/07/2006	1			
SW-8B				01/07/2006	01/07/2006	1	01/07/2006	01/07/2006	1			
SW-9B				01/04/2006	01/04/2006	1	01/04/2006	01/04/2006	1			
A-Dock	07/01/1997	07/01/1997	1	07/01/1997	02/17/2004	6	07/01/1997	02/17/2004	6	07/01/1997	06/19/1998	4
C-CON				07/13/2005	10/03/2007	52	07/13/2005	10/03/2007	52			
C-NR1				07/13/2005	10/03/2007	52	07/13/2005	10/03/2007	52			
C-NR3				07/14/2005	10/03/2007	52	07/14/2005	10/03/2007	52			
C-NR4				07/14/2005	10/03/2007	52	07/14/2005	10/03/2007	52			
CON	07/01/1997	06/11/2003	4	07/01/1997	10/03/2007	70	07/01/1997	10/03/2007	71	07/01/1997	06/10/2004	28
Needles Gauge				09/08/2003	02/16/2004	2	09/08/2003	02/16/2004	2			
NR-1	06/11/2004	06/11/2004	1	08/06/2002	10/03/2007	43	08/06/2002	10/03/2007	44	03/16/2004	06/11/2004	2
NR-2				08/06/2002	10/03/2007	43	08/06/2002	10/03/2007	44	03/16/2004	06/11/2004	2
NR-3				02/17/2004	10/03/2007	41	02/17/2004	10/03/2007	42	03/16/2004	06/11/2004	2
SW-1B				01/04/2006	01/04/2006	1	01/04/2006	01/04/2006	1			
SW-2B				01/04/2006	01/04/2006	1	01/04/2006	01/04/2006	1			
SW-3B				01/05/2006	01/05/2006	1	01/05/2006	01/05/2006	1			
SW-4B				01/05/2006	01/05/2006	1	01/05/2006	01/05/2006	1			
SW-5B				01/06/2006	01/06/2006	1	01/06/2006	01/06/2006	1			
SW-6B				01/06/2006	01/06/2006	1	01/06/2006	01/06/2006	1			
SW-7B				01/06/2006	01/06/2006	1	01/06/2006	01/06/2006	1			

Table 3-2. Summary of Surface Water Sampling Events

	Chloride			Chromium, hexavalent			Chromium, total			Copper		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
Number of Samples			46			993			1005			170
Count of Locations Sampled			8			43			43			17

Table 3-2. Summary of Surface Water Sampling Events

	Fluoride			Iron			Lead			Magnesium		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
C-MAR												
C-I-3												
C-R22												
C-R27												
C-TAZ												
I-3	07/01/1997	06/10/2004	6	06/10/2003	06/10/2004	2	07/01/1997	11/29/2001	4	07/01/1997	06/10/2004	6
R-19												
R-19-B												
R-19-C												
R-20												
R-20-B												
R-20-C												
R-22												
R-27	06/10/2003	06/14/2005	3	06/10/2003	03/06/2006	3				06/10/2003	09/11/2007	16
R-28	06/10/2003	06/14/2005	3	06/10/2003	03/06/2006	3				06/10/2003	09/12/2007	16
RRB	07/01/1997	07/01/1997	1				07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1
Seasonal Wetlands	07/01/1997	07/01/1997	1				07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1
SW-10B												
SW-11B												
SW-12B												
SW-13B												
SW-14B												

Table 3-2. Summary of Surface Water Sampling Events

	Fluoride			Iron			Lead			Magnesium		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
SW-15B												
SW-16B												
SW-8B												
SW-9B												
A-Dock	07/01/1997	07/01/1997	1				07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1
C-CON												
C-NR1												
C-NR3												
C-NR4												
CON	07/01/1997	06/11/2003	4	06/11/2003	06/11/2003	1	07/01/1997	11/29/2001	3	07/01/1997	06/11/2003	4
Needles Gauge												
NR-1	06/11/2004	06/11/2004	1	06/11/2004	06/11/2004	1				06/11/2004	06/11/2004	1
NR-2												
NR-3												
SW-1B												
SW-2B												
SW-3B												
SW-4B												
SW-5B												
SW-6B												
SW-7B												

Table 3-2. Summary of Surface Water Sampling Events

	Fluoride			Iron			Lead			Magnesium		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
Number of Samples			20			10			10			46
Count of Locations Sampled			8			5			5			8

Table 3-2. Summary of Surface Water Sampling Events

	Manganese			Molybdenum			Nickel			Nitrate as nitrogen		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
C-MAR										03/13/2007	03/13/2007	2
C-I-3										03/13/2007	03/13/2007	3
C-R22										03/13/2007	03/13/2007	3
C-R27										03/13/2007	03/13/2007	3
C-TAZ										03/13/2007	03/13/2007	3
I-3	07/01/1997	06/10/2004	6	07/01/1997	11/29/2001	4	07/01/1997	06/10/2004	27	07/01/1997	06/10/2004	6
R-19							09/04/1998	09/04/1998	1			
R-19-B							09/04/1998	09/04/1998	2			
R-19-C							09/04/1998	09/04/1998	2			
R-20							09/04/1998	09/04/1998	1			
R-20-B							09/04/1998	09/04/1998	2			
R-20-C							09/04/1998	09/04/1998	1			
R-22							07/19/1999	06/10/2004	22			
R-27	06/10/2003	03/06/2006	3				06/08/1999	06/10/2004	22	06/10/2003	09/11/2007	15
R-28	06/10/2003	03/06/2006	3	08/06/2002	08/06/2002	1	06/08/1999	06/10/2004	22	06/10/2003	09/12/2007	15
RRB	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	06/10/2004	22	07/01/1997	07/01/1997	1
Seasonal Wetlands	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	03/25/2000	8	07/01/1997	07/01/1997	1
SW-10B												
SW-11B												
SW-12B												
SW-13B												
SW-14B												

Table 3-2. Summary of Surface Water Sampling Events

	Manganese			Molybdenum			Nickel			Nitrate as nitrogen		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
SW-15B												
SW-16B												
SW-8B												
SW-9B												
A-Dock	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	06/19/1998	4	07/01/1997	07/01/1997	1
C-CON												
C-NR1												
C-NR3												
C-NR4												
CON	07/01/1997	06/11/2003	4	07/01/1997	11/29/2001	3	07/01/1997	06/10/2004	28	07/01/1997	06/11/2003	4
Needles Gauge												
NR-1	06/11/2004	06/11/2004	1				03/16/2004	06/11/2004	2	06/11/2004	06/11/2004	1
NR-2							03/16/2004	06/11/2004	2			
NR-3							03/16/2004	06/11/2004	2			
SW-1B												
SW-2B												
SW-3B												
SW-4B												
SW-5B												
SW-6B												
SW-7B												

Table 3-2. Summary of Surface Water Sampling Events

	Manganese			Molybdenum			Nickel			Nitrate as nitrogen		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
Number of Samples			20			11			170			58
Count of Locations Sampled			8			6			17			13

Table 3-2. Summary of Surface Water Sampling Events

	Perchlorate			Potassium			Sodium			Sulfate		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
C-MAR												
C-I-3												
C-R22												
C-R27												
C-TAZ												
I-3	06/10/2003	06/10/2003	1	07/01/1997	06/10/2004	6	07/01/1997	06/10/2004	6	07/01/1997	06/10/2004	6
R-19												
R-19-B												
R-19-C												
R-20												
R-20-B												
R-20-C												
R-22												
R-27				06/10/2003	09/11/2007	16	06/10/2003	09/11/2007	16	06/10/2003	09/11/2007	16
R-28				06/10/2003	09/12/2007	16	06/10/2003	09/12/2007	16	06/10/2003	09/12/2007	16
RRB				07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1
Seasonal Wetlands				07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1
SW-10B												
SW-11B												
SW-12B												
SW-13B												
SW-14B												

Table 3-2. Summary of Surface Water Sampling Events

	Perchlorate			Potassium			Sodium			Sulfate		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
SW-15B												
SW-16B												
SW-8B												
SW-9B												
A-Dock				07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1
C-CON												
C-NR1												
C-NR3												
C-NR4												
CON	06/11/2003	06/11/2003	1	07/01/1997	06/11/2003	4	07/01/1997	06/11/2003	4	07/01/1997	06/11/2003	4
Needles Gauge												
NR-1				06/11/2004	06/11/2004	1	06/11/2004	06/11/2004	1	06/11/2004	06/11/2004	1
NR-2												
NR-3												
SW-1B												
SW-2B												
SW-3B												
SW-4B												
SW-5B												
SW-6B												
SW-7B												

Table 3-2. Summary of Surface Water Sampling Events

	Perchlorate			Potassium			Sodium			Sulfate		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.	First	Last	No.
Number of Samples			2			46			46			46
Count of Locations Sampled			2			8			8			8

Table 3-2. Summary of Surface Water Sampling Events

	Sulfide			Vanadium			Zinc		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.
C-MAR									
C-I-3									
C-R22									
C-R27									
C-TAZ									
I-3	07/01/1997	06/10/2004	5	07/01/1997	11/29/2001	4	07/01/1997	06/10/2004	27
R-19							09/04/1998	09/04/1998	1
R-19-B							09/04/1998	09/04/1998	2
R-19-C							09/04/1998	09/04/1998	2
R-20							09/04/1998	09/04/1998	1
R-20-B							09/04/1998	09/04/1998	2
R-20-C							09/04/1998	09/04/1998	1
R-22							07/19/1999	06/10/2004	22
R-27	06/10/2004	06/10/2004	1				06/08/1999	06/10/2004	22
R-28	06/10/2004	06/10/2004	1	08/06/2002	08/06/2002	1	06/08/1999	06/10/2004	22
RRB	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	06/10/2004	22
Seasonal Wetlands	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	03/25/2000	8
SW-10B									
SW-11B									
SW-12B									
SW-13B									
SW-14B									

Table 3-2. Summary of Surface Water Sampling Events

	Sulfide			Vanadium			Zinc		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.
SW-15B									
SW-16B									
SW-8B									
SW-9B									
A-Dock	07/01/1997	07/01/1997	1	07/01/1997	07/01/1997	1	07/01/1997	06/19/1998	4
C-CON									
C-NR1									
C-NR3									
C-NR4									
CON	07/01/1997	11/29/2001	3	07/01/1997	11/29/2001	3	07/01/1997	06/10/2004	28
Needles Gauge									
NR-1	06/11/2004	06/11/2004	1				03/16/2004	06/11/2004	2
NR-2							03/16/2004	06/11/2004	2
NR-3							03/16/2004	06/11/2004	2
SW-1B									
SW-2B									
SW-3B									
SW-4B									
SW-5B									
SW-6B									
SW-7B									

Table 3-2. Summary of Surface Water Sampling Events

	Sulfide			Vanadium			Zinc		
Sample Location	First	Last	No.	First	Last	No.	First	Last	No.
Number of Samples			14			11			170
Count of Locations Sampled			8			6			17

Notes:

(1) Ammonia and ammonia as nitrogen are combined in this analysis.

(2) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

Table 3-3. Summary of Groundwater Well Groupings

Background Groundwater	Site Groundwater	Floodplain Groundwater
ADOT New Well	MW-1	MW-20-70
BOR-2	MW-3	MW-20-100
CA Agriculture Station	MW-4	MW-20-130
EPNG-2	MW-5	MW-22
GSRV-2	MW-6	MW-23
GSWC-1	MW-7	MW-27-20
GSWC-2	MW-8	MW-27-60
GSWC-4	MW-9	MW-27-85
Langmaack	MW-10	MW-28-25
Lily Hill	MW-11	MW-28-90
MW-16	MW-12	MW-29
MW-17	MW-13	MW-30-30
MW-18	MW-14	MW-30-50
Needles MW-10	MW-15	MW-31-60
Needles MW-11	MW-19	MW-31-135
Needles MW-12	MW-20-70	MW-32-20
New Farm Well	MW-20-100	MW-32-35
P-2	MW-20-130	MW-33-40
PGE-9S	MW-21	MW-33-90
PMM-Supply	MW-22	MW-33-150
Sanders	MW-23	MW-33-210
Tayloe	MW-24A	MW-34-55
TMLP-2	MW-24B	MW-34-80
Topock-2	MW-24BR	MW-34-100
USFW-5	MW-25	MW-35-60
	MW-26	MW-35-135
	MW-27-20	MW-36-20
	MW-27-60	MW-36-40
	MW-27-85	MW-36-50
	MW-28-25	MW-36-70
	MW-28-90	MW-36-90
	MW-29	MW-36-100
	MW-30-30	MW-39-40

Table 3-3. Summary of Groundwater Well Groupings

Background Groundwater	Site Groundwater	Floodplain Groundwater
	MW-30-50	MW-39-50
	MW-31-60	MW-39-60
	MW-31-135	MW-39-70
	MW-32-20	MW-39-80
	MW-32-35	MW-39-100
	MW-33-40	MW-42-30
	MW-33-90	MW-42-55
	MW-33-150	MW-42-65
	MW-33-210	MW-43-25
	MW-34-55	MW-43-75
	MW-34-80	MW-43-90
	MW-34-100	MW-44-70
	MW-35-60	MW-44-115
	MW-35-135	MW-44-125
	MW-36-20	MW-45-095a
	MW-36-40	MW-46-175
	MW-36-50	MW-46-205
	MW-36-70	MW-47-55
	MW-36-90	MW-47-115
	MW-36-100	MW-49-135
	MW-37S	MW-49-275
	MW-37D	MW-49-365
	MW-38S	MW-52S
	MW-38D	MW-52M
	MW-39-40	MW-52D
	MW-39-50	MW-53M
	MW-39-60	MW-53D
	MW-39-70	PE-1
	MW-39-80	PT-1S
	MW-39-100	PT-1M
	MW-40S	PT-1D
	MW-40D	PT-2S
	MW-41S	PT-2M

Table 3-3. Summary of Groundwater Well Groupings

Background Groundwater	Site Groundwater	Floodplain Groundwater
	MW-41M	PT-2D
	MW-41D	PT-3S
	MW-42-30	PT-3M
	MW-42-55	PT-3D
	MW-42-65	PT-4S
	MW-43-25	PT-4M
	MW-43-75	PT-4D
	MW-43-90	PT-5S
	MW-44-70	PT-5M
	MW-44-115	PT-5D
	MW-44-125	PT-6S
	MW-45-095a	PT-6M
	MW-46-175	PT-6D
	MW-46-205	PTI-1S
	MW-47-55	PTI-1M
	MW-47-115	PTI-1D
	MW-48	TW-2S
	MW-49-135	TW-2D
	MW-49-275	TW-3D
	MW-49-365	TW-4
	MW-50-095	
	MW-50-200	
	MW-51	
	MW-52S	
	MW-52M	
	MW-52D	
	MW-53M	
	MW-53D	
	MW-54-85	
	MW-54-140	
	MW-54-195	
	MW-55-45	
	MW-55-120	

Table 3-3. Summary of Groundwater Well Groupings

Background Groundwater	Site Groundwater	Floodplain Groundwater
	MW-56S	
	MW-56M	
	MW-56D	
	MWP-12	
	OW-1S	
	OW-1M	
	OW-1D	
	OW-2S	
	OW-2M	
	OW-2D	
	OW-3S	
	OW-3M	
	OW-3D	
	OW-5S	
	OW-5M	
	OW-5D	
	PE-1	
	PGE-6	
	PGE-7	
	PGE-7BR	
	PGE-8	
	Park Moabi-4	
	PT-1S	
	PT-1M	
	PT-1D	
	PT-2S	
	PT-2M	
	PT-2D	
	PT-3S	
	PT-3M	
	PT-3D	
	PT-4S	
	PT-4M	

Table 3-3. Summary of Groundwater Well Groupings

Background Groundwater	Site Groundwater	Floodplain Groundwater
	PT-4D	
	PT-5S	
	PT-5M	
	PT-5D	
	PT-6S	
	PT-6M	
	PT-6D	
	PT-7S	
	PT-7M	
	PT-7D	
	PT-8S	
	PT-8M	
	PT-8D	
	PT-9S	
	PT-9M	
	PT-9D	
	PTI-1S	
	PTI-1M	
	PTI-1D	
	PTR-1	
	PTR-2	
	TW-1	
	TW-2S	
	TW-2D	
	TW-3D	
	TW-4	
	TW-5	
	CW-1M	
	CW-1D	
	CW-2M	
	CW-2D	
	CW-3M	
	CW-3D	

Table 3-3. Summary of Groundwater Well Groupings

Background Groundwater	Site Groundwater	Floodplain Groundwater
	CW-4M	
	CW-4D	

Table 3-4a. Summary of Constituents Sampled in Background Groundwater

Metals		Other Inorganic Compounds, Perchlorate and Strontium		Radiological Compounds
√	Aluminum	√	Alkalinity, bicarb as CaCO3	Tritium
√	Antimony	√	Ammonia as nitrogen	
√	Arsenic	√	Calcium	
√	Barium	√	Chloride	
√	Beryllium	√	Fluoride	
	Cadmium	√	Iron	
√	Chromium, hexavalent	√	Magnesium	
√	Chromium, total	√	Manganese	
√	Cobalt	√	Nitrate as nitrogen	
√	Copper		Perchlorate	
√	Lead	√	Potassium	
	Mercury	√	Sodium	
√	Molybdenum	√	Strontium	
√	Nickel	√	Sulfate	
√	Selenium		Sulfide	
√	Silver			
√	Thallium			
√	Vanadium			
√	Zinc			

Notes:

(1) As discussed in Section 3.2.2, there are 13 general chemical parameters (categorized as “other inorganic compounds” in this risk assessment) that DTSC and USDOI requested be carried through a screening-level evaluation in order to ascertain whether they should be included in the quantitative groundwater human health risk assessments or the groundwater-to-surface water transport evaluation.

(2) Check mark (√) indicates a chemical was detected in at least one sample.

Table 3-4b. Summary of Constituents Sampled in Site Groundwater

Metals	Other Inorganic Compounds, Perchlorate and Strontium	Radiological Compounds	VOCs and TPH	SVOCs	PAHs	PCBs
√ Aluminum	√ Alkalinity, bicarb as CaCO3	Gross Alpha	Acetone	t-Amyl methyl ether	Acenaphthene	PCB 1016
√ Antimony	√ Ammonia as nitrogen	√ Gross Beta	Acrolein	Aniline	Acenaphthylene	PCB 1221
√ Arsenic	√ Calcium	Radium 226	Acrylonitrile	Azobenzene	Anthracene	PCB 1232
√ Barium	√ Chloride	Radium 228	√ Benzene	Benzidene	Benzo(a)anthracene	PCB 1242
√ Beryllium	√ Fluoride	Tritium	Bis(2-chloroethyl)ether	Benzoic acid	Benzo(a)pyrene	PCB 1248
√ Cadmium	√ Iron	√ Uranium	Bis(2-chloroisopropyl)ether	Benzyl alcohol	Benzo(b)fluoranthene	PCB 1254
√ Chromium, hexavalent	√ Magnesium		Braomochloromethane	Bis (2-chloroethoxy) methane	Benzo(ghi)perylene	PCB 1260
√ Chromium, total	√ Manganese		Bromobenzene	Bis (2-ethylhexyl) phthalate	Benzo(k)fluoranthene	PCB 1262
√ Cobalt	√ Nitrate as nitrogen		Bromodichloromethane	4-Bromophenyl phenyl ether	Chrysene	PCB 1268
√ Copper	√ Perchlorate		Bromoform	t-Butyl alcohol	Dibenzo(a,h)anthracene	
√ Lead	√ Potassium		Bromomethane	Butyl benzyl phthalate	Indeno(1,2,3-cd)pyrene	
√ Mercury	√ Sodium		Methyl t-butyl ether (mtbe)	Ethyl-t-butyl ether	2-Methylnaphthalene	
√ Molybdenum	√ Strontium		n-Butylbenzene	4-Chloro-3-methylphenol	√ Naphthalene	
√ Nickel	√ Sulfate		sec-Butylbenzene	4-Chloroaniline	Pyrene	
√ Selenium	√ Sulfide		t-Butylbenzene	2-Chloronaphthalene		
√ Silver			√ Carbon disulfide	2-Chlorophenol		
√ Thallium			Carbon tetrachloride	4-Chlorophenyl phenyl ether		
√ Vanadium			Chlorobenzene	Dibenzofuran		
√ Zinc			Chloroethane	Di-n-butyl phthalate		
			2-Chloroethyl vinyl ether	3,3'-Dichlorobenzidene		
			√ Chloroform	2,4-Dichlorophenol		
			Chloromethane	Diethyl phthalate		
			p-Chlorotoluene	Di-isopropyl ether		
			2-Chlorotoluene (o-Chlorotoluene)	Dimethyl phthalate		
			1,2-Dibromo-3-chloropropane	2,4-Dimethylphenol		
			Dibromochloromethane	4,6-Dinitro-2-methylphenol		
			1,2-Dibromoethane	2,4-Dinitrophenol		
			Dibromomethane	2,4-Dinitrotoluene		
			1,2-Dichlorobenzene	2,6-Dinitrotoluene		
			1,3-Dichlorobenzene	Di-n-octyl phthalate		
			1,4-Dichlorobenzene	Fluoranthene		
			Dichlorodifluoromethane	Fluorene		
			1,1-Dichloroethane	Hexachlorobenzene		
			1,2-Dichloroethane	Hexachloroethane		
			1,1-Dichloroethene	2-Methylphenol		
			cis-1,2-Dichloroethene	4-Methylphenol		
			trans-1,2-Dichloroethene	2-Nitroaniline		
			1,2-Dichloropropane	3-Nitroaniline		
			1,3-Dichloropropane	4-Nitroaniline		

Table 3-4b. Summary of Constituents Sampled in Site Groundwater

Metals	Other Inorganic Compounds, Perchlorate and Strontium	Radiological Compounds	VOCs and TPH	SVOCs	PAHs	PCBs
			2,2-Dichloropropane	2-Nitrophenol		
			1,1-Dichloropropene	4-Nitrophenol		
			cis-1,3-Dichloropropene	n-Nitrosodimethylamine		
			trans-1,3-Dichloropropene	n-Nitroso-di-n-propylamine		
			Dichlorotrifluoromethane	n-Nitrosodiphenylamine		
			Ethylbenzene	Pentachlorophenol/pcp		
			Hexachlorobutadiene	Phenanthrene		
			Hexachlorocyclopentadiene	Phenol		
			2-Hexanone			
			Iodomethane			
			Isobutyl Alcohol			
			Isophorone			
			Isopropylbenzene			
			4-Isopropyltoluene			
			Methyl Ethyl Ketone			
			Methyl isobutyl ketone			
			Methylene chloride			
			Nitrobenzene			
			n-Propylbenzene			
			Styrene			
			1,1,1,2-Tetrachloroethane			
			1,1,2,2-Tetrachloroethane			
			Tetrachloroethene			
			√ Toluene			
			Total xylenes			
			TPH as diesel			
			TPH as gasoline			
			TPH as motor oil			
			1,2,3-Trichlorobenzene			
			1,2,4-Trichlorobenzene			
			1,1,1-Trichloroethane			
			1,1,2-Trichloroethane			
			Trichloroethene			
			Trichlorofluoromethane (Freon 11)			
			2,4,5-Trichlorophenol			
			2,4,6-Trichlorophenol			
			1,2,3-Trichloropropane			
			1,1,2-Trichlorotrifluoroethane (Freon 113)			
			1,2,4-Trimethylbenzene			

Table 3-4b. Summary of Constituents Sampled in Site Groundwater

Metals	Other Inorganic Compounds, Perchlorate and Strontium	Radiological Compounds	VOCs and TPH	SVOCs	PAHs	PCBs
			1,3,5-Trimethylbenzene			
			Vinyl acetate			
			Vinyl chloride			
			o-Xylene			
			m+p-Xylenes			

Notes:

(1) As discussed in Section 3.2.2, there are 13 general chemical parameters (categorized as “other inorganic compounds” in this risk assessment) that DTSC and USDOI requested be carried through a screening-level evaluation in order to ascertain whether they should be included in the quantitative groundwater human health risk assessments or the groundwater-to-surface water transport evaluation.

(2) Check mark (√) indicates a chemical was detected in at least one sample.

(3) Ammonia and ammonia as nitrogen are combined into ammonia as nitrogen.

(4) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined into nitrate as nitrogen.

PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
SVOCs = semivolatile organic compounds
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-4c. Summary of Constituents Sampled in Floodplain Groundwater

Metals	Other Inorganic Compounds, Perchlorate and Strontium	VOCs and TPH	SVOCs	PAHs	PCBs
√ Aluminum	√ Alkalinity, bicarb as CaCO3	Acetone	t-Amyl methyl ether	Acenaphthene	PCB 1016
√ Antimony	√ Ammonia as nitrogen	Acrolein	Aniline	Acenaphthylene	PCB 1221
√ Arsenic	√ Calcium	Acrylonitrile	Azobenzene	Anthracene	PCB 1232
√ Barium	√ Chloride	Benzene	Benzidene	Benzo(a)anthracene	PCB 1242
√ Beryllium	√ Fluoride	Bis(2-chloroethyl)ether	Benzoic acid	Benzo(a)pyrene	PCB 1248
Cadmium	√ Iron	Bis(2-chloroisopropyl)ether	Benzyl alcohol	Benzo(b)fluoranthene	PCB 1254
√ Chromium, hexavalent	√ Magnesium	Braomochloromethane	Bis (2-ethylhexyl) phthalate	Benzo(ghi)perylene	PCB 1260
√ Chromium, total	√ Manganese	Bromobenzene	4-Bromophenyl phenyl ether	Benzo(k)fluoranthene	PCB 1262
√ Cobalt	√ Nitrate as nitrogen	Bromodichloromethane	t-Butyl alcohol	Chrysene	PCB 1268
√ Copper	Perchlorate	Bromoform	Butyl benzyl phthalate	Dibenzo(a,h)anthracene	
√ Lead	√ Potassium	Bromomethane	Ethyl-t-butyl ether	Indeno(1,2,3-cd)pyrene	
√ Mercury	√ Sodium	n-Butylbenzene	4-Chloro-3-methylphenol	2-Methylnaphthalene	
√ Molybdenum	√ Strontium	sec-Butylbenzene	4-Chloroaniline	Naphthalene	
√ Nickel	√ Sulfate	t-Butylbenzene	Bis (2-chloroethoxy) methane	Pyrene	
√ Selenium	√ Sulfide	Carbon disulfide	2-Chloronaphthalene		
√ Silver		Carbon tetrachloride	2-Chlorophenol		
Thallium		Chlorobenzene	4-Chlorophenyl phenyl ether		
√ Vanadium		Chloroethane	Dibenzofuran		
√ Zinc		2-Chloroethyl vinyl ether	Di-n-butyl phthalate		
		√ Chloroform	3,3'-Dichlorobenzidene		
		Chloromethane	2,4-Dichlorophenol		
		P-chlorotoluene	Diethyl phthalate		
		2-Chlorotoluene (o-Chlorotoluene)	Di-isopropyl ether		
		1,2-Dibromo-3-chloropropane	Dimethyl phthalate		
		Dibromochloromethane	2,4-Dimethylphenol		
		1,2-Dibromoethane	4,6-Dinitro-2-methylphenol		
		Dibromomethane	2,4-Dinitrophenol		
		1,2-Dichlorobenzene	2,4-Dinitrotoluene		
		1,3-Dichlorobenzene	2,6-Dinitrotoluene		
		1,4-Dichlorobenzene	Di-n-octyl phthalate		
		Dichlorodifluoromethane	Fluoranthene		
		1,1-Dichloroethane	Fluorene		
		1,2-Dichloroethane	Hexachlorobenzene		

Table 3-4c. Summary of Constituents Sampled in Floodplain Groundwater

Metals	Other Inorganic Compounds, Perchlorate and Strontium	VOCs and TPH	SVOCs	PAHs	PCBs
		1,1-Dichloroethene	Hexachloroethane		
		cis-1,2-Dichloroethene	2-Methylphenol		
		trans-1,2-Dichloroethene	4-Methylphenol		
		1,2-Dichloropropane	2-Nitroaniline		
		1,3-Dichloropropane	3-Nitroaniline		
		2,2-Dichloropropane	4-Nitroaniline		
		1,1-Dichloropropene	2-Nitrophenol		
		cis-1,3-Dichloropropene	4-Nitrophenol		
		trans-1,3-Dichloropropene	n-Nitrosodimethylamine		
		Dichlorotrifluoromethane	n-Nitroso-di-n-propylamine		
		Ethylbenzene	n-Nitrosodiphenylamine		
		Hexachlorobutadiene	Pentachlorophenol/pcp		
		Hexachlorocyclopentadiene	Phenanthrene		
		2-Hexanone	Phenol		
		Iodomethane			
		Isobutyl Alcohol			
		Isophorone			
		Isopropylbenzene			
		4-Isopropyltoluene			
		Methyl Ethyl Ketone			
		Methyl isobutyl ketone			
		Methyl t-butyl ether (mtbe)			
		Methylene chloride			
		Nitrobenzene			
		n-Propylbenzene			
		Styrene			
		1,1,1,2-Tetrachloroethane			
		1,1,2,2-Tetrachloroethane			
		Tetrachloroethene			
		Toluene			
		Total xylenes			
		1,2,3-Trichlorobenzene			
		1,2,4-Trichlorobenzene			

Table 3-4c. Summary of Constituents Sampled in Floodplain Groundwater

Metals	Other Inorganic Compounds, Perchlorate and Strontium	VOCs and TPH	SVOCs	PAHs	PCBs
		1,1,1-Trichloroethane			
		1,1,2-Trichloroethane			
		Trichloroethene			
		Trichlorofluoromethane (Freon 11)			
		2,4,5-Trichlorophenol			
		2,4,6-Trichlorophenol			
		1,2,3-Trichloropropane			
		1,1,2-Trichlorotrifluoroethane (Freon 113)			
		1,2,4-Trimethylbenzene			
		1,3,5-Trimethylbenzene			
		Vinyl acetate			
		Vinyl chloride			
		o-Xylene			
		m+p-Xylenes			

Notes:

(1) As discussed in Section 3.2.2, there are 13 general chemical parameters (categorized as “other inorganic compounds” in this risk assessment) that DTSC and USDOI requested be carried through a screening-level evaluation in order to ascertain whether they should be included in the quantitative groundwater human health risk assessments or the groundwater-to-surface water transport evaluation.

(2) Check mark (√) indicates a chemical was detected in at least one sample.

(3) See Table 3-3 for floodplain well designation.

(4) Ammonia and ammonia as nitrogen are combined into ammonia as nitrogen.

(5) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined into nitrate as nitrogen.

PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
SVOCs = semivolatile organic compounds
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Table 3-5. Summary of Surface Water Sampling Location Groupings

Upstream Surface Water	Downstream Surface Water
A-Dock	C-I-3
C-CON	C-R22
C-MAR	C-R27
C-NR1	C-TAZ
C-NR3	I-3
C-NR4	R-19
CON	R-19-B
Needles Gauge	R-19-C
NR-1	R-20
NR-2	R-20-B
NR-3	R-20-C
SW-1B	R-22
SW-2B	R-27
SW-3B	R-28
SW-4B	RRB
SW-5B	Seasonal Wetlands
SW-6B	SW-10B
SW-7B	SW-11B
CR Near Park Moabi*	SW-12B
	SW-13B
	SW-14B
	SW-15B
	SW-16B
	SW-8B
	SW-9B
	CR Down River*
	CR Above Railroad*
	CR Bat Cave Wash*

Notes:

(1) Sampling locations denoted with an asterix (*) are from the metropolitan water district (MWD) surface water sampling dataset presented in Appendix C. The data are used in Tables 4-5 and 4-6.

Table 3-6a. Summary of Constituents Sampled in Upstream Surface Water

Metals		Other Inorganic Compounds and Perchlorate	
√	Barium	√	Alkalinity, bicarb as CaCO3
	Chromium, hexavalent	√	Ammonia as nitrogen
√	Chromium, total	√	Calcium
√	Copper	√	Chloride
√	Lead	√	Fluoride
√	Molybdenum		Iron
√	Nickel	√	Magnesium
√	Vanadium	√	Manganese
√	Zinc	√	Nitrate as nitrogen
			Perchlorate
		√	Potassium
		√	Sodium
		√	Sulfate
			Sulfide

Notes:

(1) As discussed in Section 3.2.2, there are 13 general chemical parameters (categorized as "other inorganic compounds" in this risk assessment) that DTSC and USDOI requested be carried through a screening-level evaluation in order to ascertain whether they should be included in the quantitative groundwater human health risk assessments or the groundwater-to-surface water transport evaluation.

(2) Check mark (√) indicates a chemical was detected in at least one sample.

(3) See Table 3-5 for upstream/downstream location designation.

(4) Ammonia and ammonia as nitrogen are combined into ammonia as nitrogen.

(5) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined into nitrate as nitrogen.

Table 3-6b. Summary of Constituents Sampled in Downstream Surface Water

Metals		Other Inorganic Compounds and Perchlorate	
√	Barium	√	Alkalinity, bicarb as CaCO3
√	Chromium, hexavalent	√	Ammonia as nitrogen
√	Chromium, total	√	Calcium
√	Copper	√	Chloride
√	Lead	√	Fluoride
√	Molybdenum		Iron
√	Nickel	√	Magnesium
√	Vanadium	√	Manganese
√	Zinc	√	Nitrate as nitrogen
			Perchlorate
		√	Potassium
		√	Sodium
		√	Sulfate
		√	Sulfide

Notes:

(1) As discussed in Section 3.2.2, there are 13 general chemical parameters (categorized as "other inorganic compounds" in this risk assessment) that DTSC and USDOI requested be carried through a screening-level evaluation in order to ascertain whether they should be included in the quantitative groundwater human health risk assessments or the groundwater-to-surface water transport evaluation.

(2) Check mark (√) indicates a chemical was detected in at least one sample.

(3) See Table 3-5 for upstream/downstream location designation.

(4) Ammonia and ammonia as nitrogen are combined into ammonia as nitrogen.

(5) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined into nitrate as nitrogen.

(6) As discussed in the RFI/RI Volume 2, during September 2007 surface water sampling, hexavalent chromium was reported at a trace concentration of 0.4 µg/L at one in-channel surface water location (C R22). Subsequent investigation revealed that hexavalent chromium was present at low levels in the buffer solutions used for both field preservation and laboratory analysis of the samples (CH2M HILL, 2009). The presence of hexavalent chromium in the buffer solutions is thought to be responsible for the low-level hexavalent chromium result at C R22. The reported concentration of 0.4 ug/L is flagged with a "J" data qualifier, indicating that there is uncertainty regarding the reported concentration value.

Sources:

(1) CH2M HILL. 2009. Revised Final RCRA Facility Investigation/Remedial Investigation Report Volume 2. Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, PG&E Topock Compressor Station, Needles, California. January.

Table 3-7a. Summary of Groundwater and Floodplain ICOPCs in Background Groundwater

Chemical	Number of Detections	Number of Samples	Frequency of Detection (%)	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Background UTL (mg/L)	First Sampling Date	Last Sampling Date
Aluminum	27	149	18.1	5.1E-02	1.6E-01	3.5E-02	5.6E-02	05/11/2005	06/01/2006
Ammonia as nitrogen	8	149	5.4	5.9E-01	1.1E+00	2.8E-01	NA	05/11/2005	06/01/2006
Antimony	1	149	0.7	2.3E-03	2.3E-03	1.0E-03	1.2E-03	05/11/2005	06/01/2006
Arsenic	129	132	97.7	1.1E-03	1.9E-02	5.9E-03	2.4E-02	05/11/2005	06/01/2006
Barium	149	149	100.0	1.2E-02	1.9E-01	6.0E-02	2.0E-01	05/11/2005	06/01/2006
Beryllium	1	149	0.7	1.5E-03	1.5E-03	5.1E-04	6.6E-04	05/11/2005	06/01/2006
Chloride	149	149	100.0	2.4E+01	4.1E+03	3.7E+02	NA	05/11/2005	06/01/2006
Chromium, hexavalent	110	148	74.3	2.2E-04	3.8E-02	7.6E-03	3.2E-02	05/11/2005	06/01/2006
Cobalt	4	149	2.7	1.0E-03	1.6E-03	5.2E-04	8.4E-04	05/11/2005	06/01/2006
Copper	104	149	69.8	1.0E-03	2.1E-02	3.1E-03	1.1E-02	05/11/2005	06/01/2006
Fluoride	118	143	82.5	5.3E-01	4.3E+00	1.4E+00	7.1E+00	05/11/2005	06/01/2006
Iron	26	147	17.7	1.0E-01	5.1E+00	2.6E-01	NA	05/11/2005	06/01/2006
Lead	22	147	15.0	1.0E-03	4.1E-03	7.2E-04	1.9E-03	05/11/2005	06/01/2006
Molybdenum	148	149	99.3	3.5E-03	4.2E-02	1.1E-02	3.6E-02	05/11/2005	06/01/2006
Nickel	53	149	35.6	1.0E-03	4.2E-02	1.8E-03	1.1E-02	05/11/2005	06/01/2006
Nitrate as nitrogen	118	148	79.7	6.9E-01	4.8E+00	2.1E+00	5.0E+00	05/11/2005	06/01/2006
Selenium	104	149	69.8	1.0E-03	1.4E-02	2.2E-03	1.0E-02	05/11/2005	06/01/2006
Silver	8	149	5.4	1.1E-03	1.0E-02	6.9E-04	2.1E-03	05/11/2005	06/01/2006
Thallium	4	149	2.7	1.1E-03	3.0E-03	5.3E-04	9.1E-04	05/11/2005	06/01/2006
Vanadium	127	149	85.2	1.0E-03	8.0E-02	1.4E-02	6.0E-02	05/11/2005	06/01/2006
Zinc	94	143	65.7	1.1E-02	1.4E-01	2.7E-02	7.8E-02	05/11/2005	06/01/2006

Table 3-7a. Summary of Groundwater and Floodplain ICOPCs in Background Groundwater

Notes:

(1) UTLs obtained from Table 3-1, CH2M HILL (2008). UTLs for nitrate as nitrogen and fluoride were calculated after CH2M HILL(2008).

(2) Cadmium and mercury were not detected in background wells, and therefore UTLs were not calculated in the background study, CH2M HILL (2008).

(3) UTLs were not calculated for ammonia as nitrogen, chloride or iron.

(4) Ammonia and ammonia as nitrogen are combined in this analysis.

(5) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

(6) Nondetects are assumed equal to one-half the reporting limit in calculating mean concentrations.

ICOPCs = initial constituents of potential concern
mg/L = milligram(s) per liter
UTL = upper tolerance limit

Source:
CH2M HILL. 2008. Revised Groundwater Background Study Steps 3 and 4: Final Report of Results, PG&E Topock Compressor Station, Needles, California. July.

Table 3-7b. Summary of Groundwater ICOPCs in Site Groundwater

Chemical	Number of Detections	Number of Samples	Frequency of Detection (%)	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	First Sampling Date	Last Sampling Date
Aluminum	21	294	7.1	5.4E-02	7.5E-01	4.0E-02	02/17/2004	10/18/2007
Antimony	9	384	2.3	3.3E-03	1.6E-01	2.7E-03	06/08/2004	07/29/2008
Arsenic	190	460	41.3	1.1E-03	1.6E-01	7.4E-03	06/08/2004	07/29/2008
Barium	361	559	64.6	9.2E-03	5.3E+00	1.3E-01	07/01/1997	07/29/2008
Beryllium	20	374	5.3	1.1E-03	8.8E-03	9.6E-04	06/08/2004	07/29/2008
Cadmium	1	374	0.3	1.1E-02	1.1E-02	9.9E-04	06/08/2004	07/29/2008
Chromium, hexavalent	1,650	2,780	59.4	2.4E-04	1.6E+01	9.7E-01	07/01/1997	07/09/2008
Cobalt	13	374	3.5	1.0E-03	1.0E-02	1.6E-03	06/08/2004	07/29/2008
Copper	358	1,049	34.1	1.0E-03	3.1E-01	1.1E-02	07/01/1997	07/29/2008
Fluoride	426	491	86.8	5.0E-02	2.5E+01	2.6E+00	07/01/1997	10/18/2007
Lead	62	474	13.1	8.3E-04	7.6E-02	2.3E-03	07/01/1997	07/29/2008
Mercury	1	380	0.3	4.0E-04	4.0E-04	1.1E-04	06/08/2004	07/29/2008
Molybdenum	528	563	93.8	8.5E-04	3.0E-01	2.9E-02	07/01/1997	07/29/2008
Nickel	479	1,049	45.7	6.9E-04	5.0E-01	1.2E-02	07/01/1997	07/29/2008
Nitrate as nitrogen	573	844	67.9	1.1E-01	3.2E+01	3.3E+00	07/01/1997	04/29/2008
Selenium	168	396	42.4	1.0E-03	1.6E-01	5.9E-03	06/08/2004	07/29/2008
Silver	8	374	2.1	5.9E-03	8.7E-02	2.3E-03	06/08/2004	07/29/2008
Thallium	2	374	0.5	1.1E-03	1.2E-03	2.3E-03	06/08/2004	07/29/2008
Vanadium	372	462	80.5	9.6E-04	3.3E-01	1.9E-02	07/01/1997	07/29/2008
Zinc	725	1,049	69.1	3.3E-03	1.5E+00	6.2E-02	07/01/1997	07/29/2008

Table 3-7b. Summary of Groundwater ICOPCs in Site Groundwater

Notes:

(1) Ammonia and ammonia as nitrogen are combined in this analysis.

(2) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

(3) Non-detects are assumed equal to one-half the reporting limit in calculating mean concentrations.

ICOPCs = initial constituents of potential concern
mg/L = milligram(s) per liter

Table 3-7c. Summary of Floodplain ICOPCs in Floodplain Groundwater

Chemical	Number of Detections	Number of Samples	Frequency of Detection (%)	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	First Sampling Date	Last Sampling Date
Aluminum	2	46	4.3	6.1E-02	1.4E-01	4.8E-02	02/17/2004	05/05/2006
Ammonia as nitrogen	78	226	34.5	6.2E-02	1.4E+01	1.1E+00	06/15/1998	10/11/2007
Antimony	5	79	6.3	8.8E-03	1.6E-01	6.4E-03	06/08/2004	07/29/2008
Arsenic	66	134	49.3	1.1E-03	2.4E-02	4.8E-03	06/08/2004	07/29/2008
Barium	109	172	63.4	1.9E-02	5.3E+00	1.9E-01	06/15/1999	07/29/2008
Beryllium	1	79	1.3	1.1E-03	1.1E-03	9.1E-04	06/08/2004	07/29/2008
Cadmium	0	79	0.0			9.7E-04	06/08/2004	07/29/2008
Chloride	416	416	100.0	7.2E+01	2.2E+04	3.8E+03	06/15/1998	10/11/2007
Chromium, hexavalent	851	1,768	48.1	6.8E-04	1.4E+01	1.0E+00	06/15/1998	05/08/2008
Cobalt	8	79	10.1	1.1E-03	5.0E-03	1.4E-03	06/08/2004	07/29/2008
Copper	124	345	35.9	1.1E-03	3.1E-01	1.4E-02	06/15/1998	07/29/2008
Fluoride	98	142	69.0	5.0E-02	8.8E+00	2.1E+00	06/15/1999	05/04/2007
Iron	128	326	39.3	2.6E-02	2.1E+01	1.3E+00	06/10/2003	10/11/2007
Lead	21	114	18.4	9.4E-04	7.6E-02	5.0E-03	06/15/1999	07/29/2008
Mercury	1	82	1.2	4.0E-04	4.0E-04	1.1E-04	06/08/2004	07/29/2008
Molybdenum	106	115	92.2	8.5E-04	2.0E-01	2.6E-02	06/15/1999	07/29/2008
Nickel	160	345	46.4	7.9E-04	5.0E-01	1.6E-02	06/15/1998	07/29/2008
Nitrate as nitrogen	190	439	43.3	1.1E-01	2.5E+01	2.6E+00	06/15/1998	10/11/2007
Selenium	35	86	40.7	1.1E-03	2.3E-02	5.7E-03	06/08/2004	07/29/2008
Silver	1	79	1.3	4.0E-02	4.0E-02	2.1E-03	06/08/2004	07/29/2008
Thallium	0	79	0.0			2.5E-03	06/08/2004	07/29/2008
Vanadium	77	115	67.0	9.6E-04	2.4E-01	1.9E-02	06/15/1999	07/29/2008
Zinc	270	345	78.3	4.9E-03	8.2E-01	7.3E-02	06/15/1998	07/29/2008

Table 3-7c. Summary of Floodplain ICOPCs in Floodplain Groundwater

Notes:

(1) See Table 3-3 for floodplain well designation.

(2) Ammonia and ammonia as nitrogen are combined in this analysis.

(3) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

(4) Non-detects are assumed equal to one-half the reporting limit in calculating mean concentrations.

ICOPCs = initial constituents of potential concern
mg/L = milligram(s) per liter

Table 3-8a. Summary of Floodplain ICOPCs in Upstream Surface Water

Chemical	Number of Detections	Number of Samples	Frequency of Detection (%)	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	First Sampling Date	Last Sampling Date
Aluminum	NS	NS	NS	NS	NS	NS	NS	NS
Ammonia as nitrogen	3	6	50.0	0.06	0.20	0.13	07/01/1997	06/11/2004
Antimony	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS	NS	NS
Barium	5	6	83.3	0.1	0.14	0.14	07/01/1997	06/11/2004
Beryllium	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS	NS	NS
Chloride	6	6	100.0	72	84	78	07/01/1997	06/11/2004
Chromium, hexavalent	0	420	0.0	ND	ND	ND	07/01/1997	10/03/2007
Cobalt	NS	NS	NS	NS	NS	NS	NS	NS
Copper	14	38	36.8	0.0017	0.02	0.0057	07/01/1997	06/11/2004
Fluoride	6	6	100.0	0.3	0.4	0.34	07/01/1997	06/11/2004
Iron	0	2	0.0	ND	ND	ND	06/11/2003	06/11/2004
Lead	1	4	25.0	0.002	0.002	0.0020	07/01/1997	11/29/2001
Mercury	NS	NS	NS	NS	NS	NS	NS	NS
Molybdenum	2	4	50.0	0.0043	0.008	0.0050	07/01/1997	11/29/2001
Nickel	10	38	26.3	0.001	0.0069	0.0085	07/01/1997	06/11/2004
Nitrate as nitrogen	5	6	83.3	0.045	0.4516	0.26	07/01/1997	03/13/2007
Selenium	NS	NS	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS	NS	NS

Table 3-8a. Summary of Floodplain ICOPCs in Upstream Surface Water

Chemical	Number of Detections	Number of Samples	Frequency of Detection (%)	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	First Sampling Date	Last Sampling Date
Vanadium	2	4	50.0	0.0023	0.0031	0.0039	07/01/1997	11/29/2001
Zinc	29	38	76.3	0.0039	0.308	0.050	07/01/1997	06/11/2004

Notes:

(1) See Table 3-5 for upstream/downstream location designation.

(2) Ammonia and ammonia as nitrogen are combined in this analysis.

(3) Nitrate as NO_3^- and nitrate as nitrogen are combined in this analysis.

(4) Non-detects are assumed equal to one-half the reporting limit in calculating mean concentrations.

ICOPCs = initial constituents of potential concern
mg/L = milligram(s) per liter
NS = Not sampled

Table 3-8b. Summary of Floodplain ICOPCs in Downstream Surface Water

Chemical	Number of Detections	Number of Samples	Frequency of Detection (%)	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	First Sampling Date	Last Sampling Date
Aluminum	NS	NS	NS	NS	NS	NS	NS	NS
Ammonia as nitrogen	4	17	23.5	0.1	0.3	0.20	07/01/1997	03/06/2006
Antimony	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS	NS	NS
Barium	6	9	66.7	0.11	0.17	0.17	07/01/1997	06/10/2004
Beryllium	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS	NS	NS
Chloride	39	39	100.0	74	106	88	07/01/1997	09/12/2007
Chromium, hexavalent	1	547	0.2	0.0004	0.0004	0.0011	07/01/1997	10/03/2007
Cobalt	NS	NS	NS	NS	NS	NS	NS	NS
Copper	51	132	38.6	0.0019	0.119	0.0072	07/01/1997	06/10/2004
Fluoride	9	13	69.2	0.26	0.39	0.31	07/01/1997	06/14/2005
Iron	0	8	0.0	ND	ND	ND	06/10/2003	03/06/2006
Lead	2	5	40.0	0.002	0.0026	0.0021	07/01/1997	11/29/2001
Mercury	NS	NS	NS	NS	NS	NS	NS	NS
Molybdenum	6	6	100.0	0.0042	0.007	0.0053	07/01/1997	08/06/2002
Nickel	52	132	39.4	0.00094	0.03	0.0095	07/01/1997	06/10/2004
Nitrate as nitrogen	27	49	55.1	0.18	0.89	0.49	07/01/1997	09/12/2007
Selenium	NS	NS	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS	NS	NS

Table 3-8b. Summary of Floodplain ICOPCs in Downstream Surface Water

Chemical	Number of Detections	Number of Samples	Frequency of Detection (%)	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	First Sampling Date	Last Sampling Date
Vanadium	3	6	50.0	0.0022	0.253	0.045	07/01/1997	08/06/2002
Zinc	103	132	78.0	0.0036	1.06	0.060	07/01/1997	06/10/2004

Notes:

(1) See Table 3-5 for upstream/downstream location designation.

(2) Ammonia and ammonia as nitrogen are combined in this analysis.

(3) Nitrate as NO_3^- and nitrate as nitrogen are combined in this analysis.

(4) Non-detects are assumed equal to one-half the reporting limit in calculating mean concentrations.

(5) As discussed in the RFI/RI, during September 2007 surface water sampling, hexavalent chromium was reported at a trace concentration of 0.4 µg/L at one in-channel surface water location (C R22). Subsequent investigation revealed that hexavalent chromium was present at low levels in the buffer solutions used for both field preservation and laboratory analysis of the samples (CH2M HILL, 2009). The presence of hexavalent chromium in the buffer solutions is thought to be responsible for the low-level hexavalent chromium result at C R22. The reported concentration of 0.4 ug/L is flagged with a "J" data qualifier, indicating that there is uncertainty regarding the reported concentration value.

ICOPCs = initial constituents of potential concern
mg/L = milligram(s) per liter

Sources:

(1) CH2M HILL. 2009. Revised Final RCRA Facility Investigation/Remedial Investigation Report Volume 2. Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, PG&E Topock Compressor Station, Needles, California. January.

Table 3-9. Comparison of Analytical Detection Limits to Background Groundwater UTLs

Chemical of Potential Concern	Total number of samples	Total number of Non-Detects	Background UTL (mg/L)	Number of Detection Limits Above the UTL	Percent of Detection Limits Above the UTL
Aluminum	294	273	0.0558	10	3.7%
Antimony	384	375	0.00122	375	100.0%
Arsenic	460	270	0.0243	2	0.7%
Barium	559	198	0.195	197	99.5%
Beryllium	374	354	0.000663	354	100.0%
Chromium, hexavalent	2,780	1,130	0.0318	0	0.0%
Cobalt	374	361	0.000843	361	100.0%
Copper	1,049	691	0.0105	120	17.4%
Fluoride	491	65	7.12	6	9.2%
Lead	474	412	0.00191	268	65.0%
Molybdenum	563	35	0.0363	7	20.0%
Nickel	1,049	570	0.0106	420	73.7%
Nitrate as nitrogen	844	271	5.03	4	1.5%
Selenium	396	228	0.0103	1	0.4%
Silver	374	366	0.00213	226	61.7%
Thallium	374	372	0.000908	372	100.0%
Vanadium	462	90	0.0599	0	0.0%
Zinc	1,049	324	0.0777	8	2.5%

Notes:

UTLs obtained from Table 3-1, CH2M HILL (2008), except Fluroide UTL, obtained from RFI, CH2M HILL (2009)

mg/L = milligram(s) per liter
UTL = upper tolerance limit

Source:

CH2M HILL. 2008. Revised Groundwater Background Study Steps 3 and 4: Final Report of Results, PG&E Topock Compressor Station, Needles, California. July.

CH2M HILL. 2009. Revised Final RCRA Facility Investigation/Remedial Investigation Report Volume 2. Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, PG&E Topock Compressor Station, Needles, California. January.

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
Aluminum					
CW-1D	1	8	0.118	0.0558	Y
MW-1	1	2	0.0686	0.0558	Y
MW-10	2	6	0.0645	0.0558	Y
MW-12	1	6	0.0679	0.0558	Y
MW-3	1	2	0.0636	0.0558	Y
MW-34-80	1	6	0.0605	0.0558	Y
MW-4	1	2	0.0618	0.0558	Y
MW-5	1	2	0.0585	0.0558	Y
MW-6	1	2	0.0618	0.0558	Y
MW-7	1	2	0.0535	0.0558	N
OW-1M	1	15	0.111	0.0558	Y
OW-1S	1	13	0.118	0.0558	Y
OW-2S	3	13	0.152	0.0558	Y
OW-5D	2	13	0.202	0.0558	Y
OW-5M	1	13	0.749	0.0558	Y
OW-5S	1	13	0.0991	0.0558	Y
TW-2S	1	3	0.141	0.0558	Y
Antimony					
MW-10	1	15	0.0033	0.00122	Y
MW-12	2	17	0.0209	0.00122	Y
MW-20-100	1	1	0.043	0.00122	Y
MW-20-70	1	13	0.0088	0.00122	Y
MW-34-55	1	9	0.026	0.00122	Y
OW-5M	1	14	0.0111	0.00122	Y
TW-2D	1	3	0.155	0.00122	Y
TW-2S	1	3	0.153	0.00122	Y
Arsenic					
CW-1D	2	8	0.00275	0.0243	N
CW-1M	3	8	0.00228	0.0243	N
CW-2D	2	8	0.00491	0.0243	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
CW-2M	3	8	0.00279	0.0243	N
CW-3D	2	8	0.00172	0.0243	N
CW-3M	2	8	0.0013	0.0243	N
CW-4D	2	8	0.00389	0.0243	N
CW-4M	2	8	0.0027	0.0243	N
MW-1	2	2	0.0133	0.0243	N
MW-10	8	14	0.0143	0.0243	N
MW-11	6	11	0.00172	0.0243	N
MW-12	17	17	0.157	0.0243	Y
MW-13	1	2	0.0022	0.0243	N
MW-14	2	2	0.0014	0.0243	N
MW-15	1	1	0.00158	0.0243	N
MW-19	1	1	0.00132	0.0243	N
MW-20-130	9	12	0.00742	0.0243	N
MW-20-70	8	13	0.0022	0.0243	N
MW-22	3	3	0.0138	0.0243	N
MW-24A	3	4	0.0336	0.0243	Y
MW-24B	2	2	0.00843	0.0243	N
MW-25	6	10	0.00239	0.0243	N
MW-3	2	2	0.0119	0.0243	N
MW-31-135	1	1	0.00464	0.0243	N
MW-31-60	1	2	0.00196	0.0243	N
MW-32-35	2	3	0.0231	0.0243	N
MW-33-210	1	1	0.00203	0.0243	N
MW-33-90	1	1	0.00189	0.0243	N
MW-34-100	2	2	0.00201	0.0243	N
MW-34-55	4	9	0.00483	0.0243	N
MW-34-80	8	13	0.00219	0.0243	N
MW-35-135	2	2	0.00137	0.0243	N
MW-35-60	1	1	0.0015	0.0243	N
MW-37D	8	13	0.00397	0.0243	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-37S	1	1	0.00226	0.0243	N
MW-38D	2	2	0.00844	0.0243	N
MW-38S	1	2	0.00362	0.0243	N
MW-39-60	1	1	0.00221	0.0243	N
MW-4	2	2	0.00607	0.0243	N
MW-40D	1	1	0.00436	0.0243	N
MW-40S	1	1	0.0016	0.0243	N
MW-43-25	3	3	0.0244	0.0243	Y
MW-44-115	2	3	0.00693	0.0243	N
MW-44-125	1	1	0.00299	0.0243	N
MW-45-095a	1	1	0.00376	0.0243	N
MW-46-175	1	1	0.00271	0.0243	N
MW-47-55	1	1	0.00135	0.0243	N
MW-5	2	2	0.00734	0.0243	N
MW-6	2	2	0.0157	0.0243	N
MW-7	2	2	0.0138	0.0243	N
MW-8	2	2	0.00621	0.0243	N
MW-9	1	2	0.0019	0.0243	N
OW-1D	3	15	0.00477	0.0243	N
OW-1M	3	14	0.00269	0.0243	N
OW-1S	2	13	0.00132	0.0243	N
OW-2D	3	14	0.0033	0.0243	N
OW-2M	2	13	0.00165	0.0243	N
OW-2S	2	13	0.00245	0.0243	N
OW-3M	2	3	0.00271	0.0243	N
OW-5D	3	14	0.00441	0.0243	N
OW-5M	4	14	0.0144	0.0243	N
OW-5S	3	14	0.00222	0.0243	N
PT-3S	1	2	0.00508	0.0243	N
PT-4D	1	2	0.00513	0.0243	N
PT-4S	2	2	0.00656	0.0243	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
PT-5D	1	2	0.0115	0.0243	N
PT-5M	1	2	0.0111	0.0243	N
PT-5S	2	2	0.00936	0.0243	N
PT-6S	2	2	0.0152	0.0243	N
PT-7D	1	1	0.00796	0.0243	N
PT-8D	1	1	0.00707	0.0243	N
PT-9D	1	1	0.00628	0.0243	N
PTI-1S	2	2	0.0132	0.0243	N
TW-2D	1	5	0.00453	0.0243	N
Barium					
CW-1D	5	8	0.0721	0.195	N
CW-1M	6	8	0.0862	0.195	N
CW-2D	5	8	0.0766	0.195	N
CW-2M	6	8	0.0684	0.195	N
CW-3D	5	8	0.119	0.195	N
CW-3M	5	8	0.0611	0.195	N
CW-4D	5	8	0.0741	0.195	N
CW-4M	5	8	0.0758	0.195	N
MW-1	2	2	0.0263	0.195	N
MW-10	14	18	0.18	0.195	N
MW-11	11	14	0.22	0.195	Y
MW-12	15	21	0.11	0.195	N
MW-13	5	7	0.071	0.195	N
MW-14	6	7	0.13	0.195	N
MW-15	5	6	0.12	0.195	N
MW-19	4	5	0.086	0.195	N
MW-20-100	4	5	0.042	0.195	N
MW-20-130	13	16	0.049	0.195	N
MW-20-70	14	17	0.0591	0.195	N
MW-21	3	8	0.042	0.195	N
MW-22	3	7	0.5	0.195	Y

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-23	3	8	5.3	0.195	Y
MW-24A	4	7	0.944	0.195	Y
MW-24B	4	5	0.0386	0.195	N
MW-24BR	3	4	0.3	0.195	Y
MW-25	11	14	0.0489	0.195	N
MW-26	3	7	0.17	0.195	N
MW-27-20	3	4	0.26	0.195	Y
MW-28-25	3	4	0.24	0.195	Y
MW-28-90	1	1	0.11	0.195	N
MW-29	3	4	0.3	0.195	Y
MW-3	2	2	0.0159	0.195	N
MW-30-30	4	5	1.1	0.195	Y
MW-31-135	2	2	0.067	0.195	N
MW-31-60	4	6	0.054	0.195	N
MW-32-20	1	1	5.14	0.195	Y
MW-33-210	1	3	0.0525	0.195	N
MW-33-40	1	2	0.021	0.195	N
MW-33-90	2	3	0.069	0.195	N
MW-34-100	2	4	0.0259	0.195	N
MW-34-55	7	10	0.0876	0.195	N
MW-34-80	11	15	0.0541	0.195	N
MW-35-135	3	3	0.064	0.195	N
MW-35-60	2	2	0.1	0.195	N
MW-36-100	1	1	0.0546	0.195	N
MW-36-20	1	1	0.128	0.195	N
MW-36-40	1	1	0.158	0.195	N
MW-36-50	1	1	0.0751	0.195	N
MW-36-70	1	1	0.0754	0.195	N
MW-36-90	1	1	0.0387	0.195	N
MW-37D	11	13	0.0659	0.195	N
MW-37S	2	2	0.11	0.195	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-38D	2	2	0.069	0.195	N
MW-38S	2	2	0.0387	0.195	N
MW-39-100	1	1	0.0233	0.195	N
MW-39-40	1	1	0.057	0.195	N
MW-39-50	1	1	0.0398	0.195	N
MW-39-60	2	2	0.0878	0.195	N
MW-39-70	1	1	0.0287	0.195	N
MW-39-80	1	1	0.0221	0.195	N
MW-4	2	2	0.0176	0.195	N
MW-40D	2	2	0.127	0.195	N
MW-40S	2	2	0.103	0.195	N
MW-44-125	1	1	0.0708	0.195	N
MW-45-095a	1	1	0.0196	0.195	N
MW-46-175	1	1	0.029	0.195	N
MW-47-55	1	1	0.0544	0.195	N
MW-5	2	2	0.0297	0.195	N
MW-6	2	2	0.0102	0.195	N
MW-7	2	2	0.0178	0.195	N
MW-8	2	2	0.0321	0.195	N
MW-9	6	7	0.073	0.195	N
OW-1D	8	15	0.113	0.195	N
OW-1M	8	15	0.0962	0.195	N
OW-1S	6	13	0.0829	0.195	N
OW-2D	7	14	0.0833	0.195	N
OW-2M	6	13	0.0672	0.195	N
OW-2S	6	13	0.0625	0.195	N
OW-3D	2	2	0.0634	0.195	N
OW-3M	4	4	0.089	0.195	N
OW-3S	3	3	0.162	0.195	N
OW-5D	7	14	0.0844	0.195	N
OW-5M	7	14	0.0601	0.195	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
OW-5S	7	14	0.0644	0.195	N
Park Moabi-4	1	1	0.112	0.195	N
PGE-6	3	3	0.031	0.195	N
PGE-7	2	2	0.038	0.195	N
PGE-8	3	3	0.064	0.195	N
TW-1	1	4	0.0427	0.195	N
TW-2D	3	3	0.0276	0.195	N
TW-2S	2	3	0.063	0.195	N
Beryllium					
CW-1D	1	7	0.0024	0.000663	Y
CW-2D	1	7	0.0024	0.000663	Y
CW-3D	1	7	0.0024	0.000663	Y
CW-3M	1	7	0.0019	0.000663	Y
CW-4D	1	7	0.002	0.000663	Y
CW-4M	1	7	0.0016	0.000663	Y
MW-43-25	1	3	0.0011	0.000663	Y
OW-1D	2	15	0.0028	0.000663	Y
OW-1M	2	14	0.0025	0.000663	Y
OW-2D	2	14	0.0023	0.000663	Y
OW-2M	2	13	0.0023	0.000663	Y
OW-2S	1	13	0.0018	0.000663	Y
OW-5D	2	14	0.0025	0.000663	Y
OW-5M	2	14	0.0088	0.000663	Y
OW-5M	1	14	0.0105	NA	NA
Chromium, hexavalent					
CW-1D	2	8	0.0012	0.0318	N
CW-1M	8	8	0.0181	0.0318	N
CW-2D	4	8	0.0033	0.0318	N
CW-2M	8	8	0.0158	0.0318	N
CW-3D	5	8	0.0047	0.0318	N
CW-3M	8	8	0.0118	0.0318	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
CW-4D	4	8	0.0034	0.0318	N
CW-4M	7	8	0.0214	0.0318	N
MW-1	3	6	0.0048	0.0318	N
MW-10	37	37	4.57	0.0318	Y
MW-11	34	34	1.71	0.0318	Y
MW-12	40	40	2.97	0.0318	Y
MW-13	35	37	0.028	0.0318	N
MW-14	36	37	0.099	0.0318	Y
MW-15	23	32	0.05	0.0318	Y
MW-19	34	34	1.39	0.0318	Y
MW-20-100	37	37	10.4	0.0318	Y
MW-20-130	38	38	14.4	0.0318	Y
MW-20-70	39	39	13.2	0.0318	Y
MW-21	1	36	0.02	0.0318	N
MW-23	14	36	1.02	0.0318	Y
MW-24A	32	32	4.3	0.0318	Y
MW-24B	34	34	6.12	0.0318	Y
MW-24BR	1	34	0.346	0.0318	Y
MW-25	33	33	2.98	0.0318	Y
MW-26	34	35	4.06	0.0318	Y
MW-27-85	1	42	0.0012	0.0318	N
MW-3	6	6	0.0117	0.0318	N
MW-30-50	34	45	3.76	0.0318	Y
MW-31-135	14	14	0.422	0.0318	Y
MW-31-60	36	36	4.52	0.0318	Y
MW-33-150	22	24	0.0108	0.0318	N
MW-33-210	23	24	0.0119	0.0318	N
MW-33-40	1	29	0.00068	0.0318	N
MW-33-90	52	56	0.0213	0.0318	N
MW-34-100	79	79	0.976	0.0318	Y
MW-34-80	13	88	0.111	0.0318	Y

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-35-135	13	14	0.0354	0.0318	Y
MW-35-60	13	13	0.0351	0.0318	Y
MW-36-100	51	51	2.98	0.0318	Y
MW-36-20	1	17	0.0026	0.0318	N
MW-36-90	38	39	3.66	0.0318	Y
MW-37D	15	15	1.97	0.0318	Y
MW-37S	14	14	0.0083	0.0318	N
MW-38D	11	11	0.328	0.0318	Y
MW-38S	11	11	0.964	0.0318	Y
MW-39-100	41	41	12.9	0.0318	Y
MW-39-50	12	18	4.14	0.0318	Y
MW-39-60	16	18	3.81	0.0318	Y
MW-39-70	27	27	8.21	0.0318	Y
MW-39-80	40	40	10.9	0.0318	Y
MW-4	6	6	0.022	0.0318	N
MW-40D	15	15	0.112	0.0318	Y
MW-40S	13	13	0.0082	0.0318	N
MW-41M	11	11	0.0105	0.0318	N
MW-41S	11	11	0.0199	0.0318	N
MW-44-115	32	32	1.71	0.0318	Y
MW-44-125	29	29	0.634	0.0318	Y
MW-45-095a	3	3	0.259	0.0318	Y
MW-46-175	29	29	0.287	0.0318	Y
MW-46-205	7	14	0.00452	0.0318	N
MW-47-115	6	8	0.0182	0.0318	N
MW-47-55	8	8	0.0619	0.0318	Y
MW-5	6	6	0.02	0.0318	N
MW-50-095	8	8	0.304	0.0318	Y
MW-50-200	8	8	12.3	0.0318	Y
MW-51	7	7	4.69	0.0318	Y
MW-6	6	6	0.01	0.0318	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-7	6	6	0.02	0.0318	N
MW-8	6	6	0.0509	0.0318	Y
MW-9	35	35	0.402	0.0318	Y
MWP-12	1	1	0.00024	0.0318	N
OW-1D	8	17	0.0013	0.0318	N
OW-1M	17	18	0.0163	0.0318	N
OW-1S	15	15	0.0216	0.0318	N
OW-2D	7	16	0.00061	0.0318	N
OW-2M	16	16	0.0077	0.0318	N
OW-2S	15	16	0.0404	0.0318	Y
OW-3D	5	8	0.0039	0.0318	N
OW-3M	10	10	0.0183	0.0318	N
OW-3S	9	9	0.0228	0.0318	N
OW-5D	2	16	0.0015	0.0318	N
OW-5M	14	16	0.0128	0.0318	N
OW-5S	16	16	0.0326	0.0318	Y
Park Moabi-4	1	2	0.0214	0.0318	N
PE-1	21	24	0.148	0.0318	Y
PGE-6	13	18	3.1	0.0318	Y
PGE-7	15	16	5.4	0.0318	Y
PT-1D	2	2	3.08	0.0318	Y
PT-2D	2	2	2.31	0.0318	Y
PT-3D	2	2	4.44	0.0318	Y
PT-4D	1	1	5.96	0.0318	Y
PT-5D	1	2	6.15	0.0318	Y
PT-6D	2	2	3.31	0.0318	Y
PT-7D	1	1	7.26	0.0318	Y
PT-7M	1	1	2.32	0.0318	Y
PT-7S	1	1	1.2	0.0318	Y
PT-8D	1	1	6.54	0.0318	Y
PT-8M	1	1	3.96	0.0318	Y

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
PT-8S	1	1	1.75	0.0318	Y
PT-9D	1	1	15.7	0.0318	Y
PT-9M	1	1	2.34	0.0318	Y
PT-9S	1	1	1.18	0.0318	Y
PTI-1D	1	1	3.35	0.0318	Y
PTI-1M	1	1	0.0033	0.0318	N
PTR-1	1	1	0.538	0.0318	Y
PTR-2	1	1	3.19	0.0318	Y
TW-1	3	3	4.61	0.0318	Y
TW-2D	12	12	7.41	0.0318	Y
TW-2S	10	10	7.19	0.0318	Y
TW-3D	22	22	4.33	0.0318	Y
TW-4	5	6	0.0355	0.0318	Y
TW-5	3	4	0.0066	0.0318	N
Cobalt					
MW-14	1	2	0.00101	0.000843	Y
MW-20-130	1	12	0.00109	0.000843	Y
MW-22	1	3	0.005	0.000843	Y
MW-33-210	1	1	0.00126	0.000843	Y
MW-34-80	5	13	0.00139	0.000843	Y
MW-37D	2	13	0.00117	0.000843	Y
OW-5M	1	14	0.01	0.000843	Y
OW-5S	1	14	0.00125	0.000843	Y
Copper					
CW-1M	2	8	0.00303	0.0105	N
CW-2D	2	8	0.00347	0.0105	N
CW-2M	1	8	0.00261	0.0105	N
CW-3M	1	8	0.00141	0.0105	N
CW-4D	1	8	0.0154	0.0105	Y
CW-4M	2	8	0.0218	0.0105	Y
MW-1	3	5	0.0079	0.0105	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-10	16	39	0.026	0.0105	Y
MW-11	12	35	0.019	0.0105	Y
MW-12	14	41	0.018	0.0105	Y
MW-13	11	27	0.011	0.0105	Y
MW-14	12	26	0.0297	0.0105	Y
MW-15	7	24	0.019	0.0105	Y
MW-19	6	22	0.0126	0.0105	Y
MW-20-100	10	23	0.05	0.0105	Y
MW-20-130	10	34	0.1	0.0105	Y
MW-20-70	16	36	0.0785	0.0105	Y
MW-21	17	25	0.111	0.0105	Y
MW-22	14	27	0.2	0.0105	Y
MW-23	10	26	0.1	0.0105	Y
MW-24A	10	25	0.076	0.0105	Y
MW-24B	8	23	0.019	0.0105	Y
MW-24BR	8	22	0.0655	0.0105	Y
MW-25	7	29	0.02	0.0105	Y
MW-26	13	25	0.0342	0.0105	Y
MW-27-20	11	22	0.0961	0.0105	Y
MW-28-25	10	21	0.0269	0.0105	Y
MW-29	12	22	0.0187	0.0105	Y
MW-3	3	5	0.00485	0.0105	N
MW-30-30	11	22	0.2	0.0105	Y
MW-30-50	1	6	0.0392	0.0105	Y
MW-31-60	7	23	0.05	0.0105	Y
MW-32-20	1	6	0.0102	0.0105	N
MW-33-40	1	6	0.0189	0.0105	Y
MW-33-90	1	6	0.306	0.0105	Y
MW-34-55	2	14	0.012	0.0105	Y
MW-34-80	4	18	0.0106	0.0105	Y
MW-35-60	1	1	0.00121	0.0105	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-37D	2	13	0.0096	0.0105	N
MW-4	4	5	0.0045	0.0105	N
MW-40D	1	1	0.00112	0.0105	N
MW-45-095a	1	1	0.00645	0.0105	N
MW-5	2	5	0.00283	0.0105	N
MW-6	2	5	0.00189	0.0105	N
MW-7	2	5	0.0013	0.0105	N
MW-8	2	5	0.0114	0.0105	Y
MW-9	17	27	0.0167	0.0105	Y
OW-1D	3	15	0.0216	0.0105	Y
OW-1M	2	15	0.021	0.0105	Y
OW-2D	4	14	0.0186	0.0105	Y
OW-2M	1	13	0.0206	0.0105	Y
OW-3M	1	4	0.00112	0.0105	N
OW-5D	4	14	0.015	0.0105	Y
OW-5M	5	14	0.0114	0.0105	Y
OW-5S	4	14	0.015	0.0105	Y
Park Moabi-4	1	1	0.00196	0.0105	N
PGE-6	10	17	0.047	0.0105	Y
PGE-7	4	15	0.0192	0.0105	Y
PGE-8	7	17	0.0053	0.0105	N
TW-2S	1	3	0.00173	0.0105	N
Fluoride					
CW-1D	7	8	4.98	7.12	N
CW-1M	8	8	3.78	7.12	N
CW-2D	7	8	7.26	7.12	Y
CW-2M	7	8	3.64	7.12	N
CW-3D	6	8	5.84	7.12	N
CW-3M	7	8	3.58	7.12	N
CW-4D	7	8	5.01	7.12	N
CW-4M	7	8	2.42	7.12	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-1	7	7	7.95	7.12	Y
MW-10	6	6	24.6	7.12	Y
MW-11	6	6	1.4	7.12	N
MW-12	6	6	6.59	7.12	N
MW-13	6	6	1.5	7.12	N
MW-14	6	6	3.2	7.12	N
MW-15	6	6	1.3	7.12	N
MW-19	5	5	2.5	7.12	N
MW-20-100	6	6	4.77	7.12	N
MW-20-130	6	6	3.6	7.12	N
MW-20-70	7	7	2.66	7.12	N
MW-21	3	4	2.3	7.12	N
MW-22	4	5	3.2	7.12	N
MW-23	2	4	1.8	7.12	N
MW-24A	4	4	5.78	7.12	N
MW-24B	5	5	3.5	7.12	N
MW-24BR	4	4	5.2	7.12	N
MW-25	6	6	1.3	7.12	N
MW-26	5	6	0.835	7.12	N
MW-27-20	4	5	0.68	7.12	N
MW-28-25	6	7	0.68	7.12	N
MW-28-90	2	3	1.8	7.12	N
MW-29	4	4	1	7.12	N
MW-3	6	6	3.85	7.12	N
MW-30-30	3	5	1.5	7.12	N
MW-31-135	3	3	4.05	7.12	N
MW-31-60	6	6	3.46	7.12	N
MW-33-40	3	3	8.78	7.12	Y
MW-33-90	4	4	3.4	7.12	N
MW-34-100	2	4	1.78	7.12	N
MW-34-55	1	3	1.3	7.12	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-34-80	1	3	1.4	7.12	N
MW-35-135	3	4	1.95	7.12	N
MW-35-60	3	3	1.92	7.12	N
MW-36-100	1	1	2.8	7.12	N
MW-36-20	2	2	2.1	7.12	N
MW-36-40	1	1	2.1	7.12	N
MW-36-50	1	1	2	7.12	N
MW-36-70	2	2	1.7	7.12	N
MW-36-90	1	1	2.5	7.12	N
MW-37D	2	2	2.6	7.12	N
MW-37S	2	2	2.4	7.12	N
MW-38D	2	2	4.58	7.12	N
MW-38S	2	2	6.9	7.12	N
MW-39-100	1	2	2.4	7.12	N
MW-39-40	2	2	3	7.12	N
MW-39-50	1	1	2.8	7.12	N
MW-39-60	2	2	2.8	7.12	N
MW-39-70	2	2	2.7	7.12	N
MW-39-80	1	1	2.3	7.12	N
MW-4	6	6	3.01	7.12	N
MW-40D	2	2	2.79	7.12	N
MW-40S	2	2	2.55	7.12	N
MW-41S	2	2	4.6	7.12	N
MW-43-25	1	2	0.63	7.12	N
MW-43-75	1	2	1.56	7.12	N
MW-43-90	1	2	1.37	7.12	N
MW-44-125	1	1	2.87	7.12	N
MW-45-095a	1	1	2.24	7.12	N
MW-46-175	1	1	3.99	7.12	N
MW-47-55	1	1	2.32	7.12	N
MW-5	6	6	6.6	7.12	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-6	6	6	8.6	7.12	Y
MW-7	6	6	5.07	7.12	N
MW-8	6	6	1.5	7.12	N
MW-9	3	6	0.2	7.12	N
OW-1D	15	16	3.91	7.12	N
OW-1M	16	16	2.41	7.12	N
OW-1S	14	14	2.74	7.12	N
OW-2D	14	15	2.38	7.12	N
OW-2M	14	15	2.29	7.12	N
OW-2S	14	14	5.23	7.12	N
OW-3D	1	1	3.89	7.12	N
OW-3M	3	3	2.58	7.12	N
OW-3S	2	2	4.59	7.12	N
OW-5D	14	15	4.56	7.12	N
OW-5M	14	15	3.97	7.12	N
OW-5S	15	15	2.82	7.12	N
PE-1	2	2	2.56	7.12	N
PGE-6	3	3	5.6	7.12	N
PGE-7	2	2	3.7	7.12	N
PGE-8	3	3	6.2	7.12	N
TW-2D	1	1	2.8	7.12	N
TW-2S	1	1	2.05	7.12	N
Lead					
CW-1D	1	8	0.0036	0.00191	Y
CW-1M	1	8	0.0054	0.00191	Y
CW-2M	1	8	0.0067	0.00191	Y
CW-3M	1	8	0.0029	0.00191	Y
CW-4M	1	8	0.0055	0.00191	Y
MW-10	6	17	0.008	0.00191	Y
MW-11	3	13	0.006	0.00191	Y
MW-12	4	20	0.0067	0.00191	Y

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-13	1	5	0.0017	0.00191	N
MW-14	3	6	0.0026	0.00191	Y
MW-15	2	4	0.0039	0.00191	Y
MW-20-100	2	4	0.017	0.00191	Y
MW-20-130	1	15	0.042	0.00191	Y
MW-20-70	3	16	0.003	0.00191	Y
MW-22	1	5	0.076	0.00191	Y
MW-23	2	6	0.027	0.00191	Y
MW-26	1	6	0.0021	0.00191	Y
MW-27-20	3	3	0.024	0.00191	Y
MW-28-25	2	3	0.014	0.00191	Y
MW-29	1	3	0.0033	0.00191	Y
MW-30-30	2	4	0.073	0.00191	Y
MW-31-60	1	5	0.021	0.00191	Y
MW-34-55	1	9	0.0122	0.00191	Y
MW-43-25	1	3	0.0059	0.00191	Y
MW-45-095a	1	1	0.00153	0.00191	N
MW-51	1	3	0.0058	0.00191	Y
MW-9	2	5	0.00317	0.00191	Y
OW-1M	1	15	0.0049	0.00191	Y
OW-1S	2	13	0.0047	0.00191	Y
OW-2D	2	14	0.0029	0.00191	Y
OW-2M	1	13	0.0032	0.00191	Y
OW-3D	1	2	0.0024	0.00191	Y
OW-3S	1	3	0.0046	0.00191	Y
OW-5D	1	14	0.0037	0.00191	Y
OW-5M	1	14	0.0102	0.00191	Y
OW-5S	1	14	0.0028	0.00191	Y
PGE-6	1	3	0.006	0.00191	Y
TW-1	1	4	0.0051	0.00191	Y

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
Mercury					
MW-22	1	3	0.0004	NA	NA
Molybdenum					
CW-1D	8	8	0.0518	0.0363	Y
CW-1M	8	8	0.0244	0.0363	N
CW-2D	8	8	0.0732	0.0363	Y
CW-2M	8	8	0.0292	0.0363	N
CW-3D	8	8	0.0882	0.0363	Y
CW-3M	8	8	0.0378	0.0363	Y
CW-4D	8	8	0.0442	0.0363	Y
CW-4M	8	8	0.031	0.0363	N
MW-1	3	12	0.078	0.0363	Y
MW-10	17	17	0.301	0.0363	Y
MW-11	13	13	0.035	0.0363	N
MW-12	20	20	0.087	0.0363	Y
MW-13	5	5	0.02	0.0363	N
MW-14	5	6	0.025	0.0363	N
MW-15	4	4	0.03	0.0363	N
MW-19	3	3	0.00772	0.0363	N
MW-20-100	3	4	0.029	0.0363	N
MW-20-130	15	15	0.0576	0.0363	Y
MW-20-70	16	16	0.0289	0.0363	N
MW-21	5	6	0.052	0.0363	Y
MW-22	5	6	0.0562	0.0363	Y
MW-23	3	6	0.015	0.0363	N
MW-24A	5	5	0.0397	0.0363	Y
MW-24B	3	3	0.0649	0.0363	Y
MW-24BR	2	2	0.058	0.0363	Y
MW-25	9	13	0.017	0.0363	N
MW-26	6	6	0.043	0.0363	Y
MW-27-20	3	3	0.0067	0.0363	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-28-25	3	3	0.0076	0.0363	N
MW-29	2	3	0.021	0.0363	N
MW-3	11	12	0.041	0.0363	Y
MW-30-30	2	4	0.1	0.0363	Y
MW-31-135	1	1	0.0309	0.0363	N
MW-31-60	5	5	0.025	0.0363	N
MW-32-35	3	3	0.019	0.0363	N
MW-33-210	1	1	0.0151	0.0363	N
MW-33-90	1	1	0.0369	0.0363	Y
MW-34-100	2	2	0.0367	0.0363	Y
MW-34-55	9	9	0.0252	0.0363	N
MW-34-80	13	13	0.02	0.0363	N
MW-35-135	2	2	0.0211	0.0363	N
MW-35-60	1	1	0.00856	0.0363	N
MW-37D	13	13	0.0518	0.0363	Y
MW-37S	1	1	0.0199	0.0363	N
MW-38D	1	1	0.0797	0.0363	Y
MW-38S	1	1	0.0637	0.0363	Y
MW-39-60	1	1	0.0109	0.0363	N
MW-4	11	12	0.024	0.0363	N
MW-40D	1	1	0.0458	0.0363	Y
MW-40S	1	1	0.00859	0.0363	N
MW-43-25	3	3	0.015	0.0363	N
MW-44-115	3	3	0.0856	0.0363	Y
MW-44-125	1	1	0.125	0.0363	Y
MW-45-095a	1	1	0.0268	0.0363	N
MW-46-175	1	1	0.196	0.0363	Y
MW-47-55	1	1	0.00805	0.0363	N
MW-48	3	3	0.019	0.0363	N
MW-5	11	12	0.15	0.0363	Y
MW-50-200	3	3	0.054	0.0363	Y

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-51	3	3	0.04	0.0363	Y
MW-6	11	12	0.022	0.0363	N
MW-7	11	12	0.026	0.0363	N
MW-8	11	12	0.022	0.0363	N
MW-9	2	5	0.0053	0.0363	N
OW-1D	17	17	0.0518	0.0363	Y
OW-1M	16	17	0.027	0.0363	N
OW-1S	14	15	0.0273	0.0363	N
OW-2D	16	16	0.0665	0.0363	Y
OW-2M	15	15	0.0353	0.0363	N
OW-2S	15	15	0.0893	0.0363	Y
OW-3D	2	2	0.0437	0.0363	Y
OW-3M	4	4	0.0206	0.0363	N
OW-3S	3	3	0.0239	0.0363	N
OW-5D	16	16	0.0838	0.0363	Y
OW-5M	16	16	0.0501	0.0363	Y
OW-5S	16	16	0.0294	0.0363	N
Park Moabi-4	1	1	0.00602	0.0363	N
PGE-6	3	3	0.03	0.0363	N
PGE-7	2	2	0.056	0.0363	Y
PGE-8	3	3	0.078	0.0363	Y
TW-1	4	4	0.022	0.0363	N
TW-2D	3	3	0.05	0.0363	Y
TW-2S	2	3	0.03	0.0363	N
Nickel					
CW-1D	2	8	0.0055	0.0106	N
CW-1M	2	8	0.00187	0.0106	N
CW-2D	2	8	0.0056	0.0106	N
CW-2M	2	8	0.0015	0.0106	N
CW-3D	3	8	0.0076	0.0106	N
CW-3M	3	8	0.0057	0.0106	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
CW-4D	2	8	0.0056	0.0106	N
CW-4M	1	8	0.00219	0.0106	N
MW-1	4	5	0.023	0.0106	Y
MW-10	20	39	0.033	0.0106	Y
MW-11	16	35	0.0203	0.0106	Y
MW-12	20	41	0.0179	0.0106	Y
MW-13	19	27	0.168	0.0106	Y
MW-14	17	26	0.0397	0.0106	Y
MW-15	14	24	0.028	0.0106	Y
MW-19	10	22	0.0202	0.0106	Y
MW-20-100	13	23	0.13	0.0106	Y
MW-20-130	14	34	0.25	0.0106	Y
MW-20-70	15	36	0.029	0.0106	Y
MW-21	20	25	0.158	0.0106	Y
MW-22	17	27	0.5	0.0106	Y
MW-23	15	26	0.25	0.0106	Y
MW-24A	11	25	0.0225	0.0106	Y
MW-24B	12	23	0.053	0.0106	Y
MW-24BR	11	22	0.0172	0.0106	Y
MW-25	15	29	0.0213	0.0106	Y
MW-26	11	25	0.0183	0.0106	Y
MW-27-20	12	22	0.11	0.0106	Y
MW-28-25	10	21	0.0206	0.0106	Y
MW-29	14	22	0.0213	0.0106	Y
MW-3	5	5	0.042	0.0106	Y
MW-30-30	15	22	0.5	0.0106	Y
MW-31-60	12	23	0.13	0.0106	Y
MW-33-90	1	6	0.00233	0.0106	N
MW-34-100	1	2	0.00109	0.0106	N
MW-34-55	6	14	0.0223	0.0106	Y
MW-34-80	11	18	0.0222	0.0106	Y

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-35-135	1	2	0.00101	0.0106	N
MW-35-60	1	1	0.00215	0.0106	N
MW-37D	4	13	0.0254	0.0106	Y
MW-39-60	1	1	0.0012	0.0106	N
MW-4	5	5	0.022	0.0106	Y
MW-40D	1	1	0.0014	0.0106	N
MW-5	4	5	0.02	0.0106	Y
MW-6	1	5	0.00144	0.0106	N
MW-7	5	5	0.02	0.0106	Y
MW-8	4	5	0.016	0.0106	Y
MW-9	15	27	0.0297	0.0106	Y
OW-1D	3	15	0.0095	0.0106	N
OW-1M	1	15	0.00468	0.0106	N
OW-1S	6	13	0.0103	0.0106	N
OW-2D	3	14	0.0135	0.0106	Y
OW-2M	1	13	0.00153	0.0106	N
OW-2S	1	13	0.00173	0.0106	N
OW-3S	1	3	0.00601	0.0106	N
OW-5D	6	14	0.0097	0.0106	N
OW-5M	4	14	0.0201	0.0106	Y
OW-5S	3	14	0.00529	0.0106	N
Park Moabi-4	1	1	0.0063	0.0106	N
PGE-6	10	17	0.014	0.0106	Y
PGE-7	9	15	0.015	0.0106	Y
PGE-8	9	17	0.045	0.0106	Y
TW-2D	1	3	0.0051	0.0106	N
Nitrate as nitrogen					
CW-1D	8	8	3.78	5.03	N
CW-1M	8	8	2.31	5.03	N
CW-2D	7	8	2.69	5.03	N
CW-2M	8	8	1.09	5.03	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
CW-3D	7	8	2.62	5.03	N
CW-3M	8	8	5.98	5.03	Y
CW-4D	7	8	1.28	5.03	N
CW-4M	7	8	1.96	5.03	N
MW-1	2	2	6.28	5.03	Y
MW-10	7	7	16.1	5.03	Y
MW-11	8	8	16.4	5.03	Y
MW-12	7	7	4.7	5.03	N
MW-13	7	7	4.68	5.03	N
MW-14	8	8	5.74	5.03	Y
MW-15	7	7	9.73	5.03	Y
MW-19	7	7	4.9	5.03	N
MW-20-100	19	19	23.2	5.03	Y
MW-20-130	19	19	20.4	5.03	Y
MW-20-70	20	20	25.1	5.03	Y
MW-21	4	4	2.68702	5.03	N
MW-22	3	8	6.75142	5.03	Y
MW-23	6	6	3.8386	5.03	N
MW-24A	7	7	18.3	5.03	Y
MW-24B	8	8	16	5.03	Y
MW-24BR	3	6	3.1612	5.03	N
MW-25	16	16	4.58	5.03	N
MW-26	17	17	7.84	5.03	Y
MW-27-20	3	17	0.27096	5.03	N
MW-28-25	3	17	0.47418	5.03	N
MW-28-90	1	4	0.43	5.03	N
MW-29	3	6	0.72256	5.03	N
MW-3	2	2	11	5.03	Y
MW-30-30	3	16	14.40604	5.03	Y
MW-30-50	5	12	3.7	5.03	N
MW-31-135	4	4	0.953	5.03	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-31-60	17	17	6.2	5.03	Y
MW-32-20	1	17	0.925	5.03	N
MW-33-150	4	5	1.41	5.03	N
MW-33-210	5	5	1.86	5.03	N
MW-33-40	2	5	0.57	5.03	N
MW-33-90	5	6	1.1	5.03	N
MW-34-100	7	8	1.39	5.03	N
MW-35-135	5	5	2.46	5.03	N
MW-35-60	4	4	2	5.03	N
MW-36-100	2	4	2.8	5.03	N
MW-36-90	1	3	2.5	5.03	N
MW-37D	3	3	3.88	5.03	N
MW-37S	3	3	1.74	5.03	N
MW-38D	4	4	14.7	5.03	Y
MW-38S	4	4	10.5	5.03	Y
MW-39-100	3	4	9.8	5.03	Y
MW-39-50	1	3	6.3	5.03	Y
MW-39-60	1	4	6.3	5.03	Y
MW-39-70	1	4	9	5.03	Y
MW-39-80	3	4	8.9	5.03	Y
MW-4	2	2	6.28	5.03	Y
MW-40D	3	3	19.7	5.03	Y
MW-40S	3	3	6.6	5.03	Y
MW-41M	2	2	0.702	5.03	N
MW-41S	3	3	1.33	5.03	N
MW-44-115	1	1	0.787	5.03	N
MW-44-125	2	2	6.43	5.03	Y
MW-45-095a	1	2	0.508	5.03	N
MW-46-175	1	2	1.57	5.03	N
MW-46-205	1	1	0.573	5.03	N
MW-47-115	1	1	1.23	5.03	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-47-55	2	2	2	5.03	N
MW-49-135	1	2	1.31	5.03	N
MW-49-275	1	2	0.745	5.03	N
MW-5	2	2	18.9	5.03	Y
MW-50-095	1	1	2.2	5.03	N
MW-50-200	1	1	6.06	5.03	Y
MW-51	1	1	14.1	5.03	Y
MW-52D	1	4	0.153	5.03	N
MW-52M	1	4	0.159	5.03	N
MW-52S	2	4	1.42	5.03	N
MW-53M	1	4	0.112	5.03	N
MW-6	2	2	2.77	5.03	N
MW-7	2	2	7.83	5.03	Y
MW-8	2	2	20.5	5.03	Y
MW-9	7	7	22.6	5.03	Y
OW-1D	16	16	3.44	5.03	N
OW-1M	16	16	6.49	5.03	Y
OW-1S	14	14	4.02	5.03	N
OW-2D	14	15	7.57	5.03	Y
OW-2M	15	15	7.16	5.03	Y
OW-2S	14	14	7.75	5.03	Y
OW-3D	1	2	0.36	5.03	N
OW-3M	4	4	1.53	5.03	N
OW-3S	3	3	3.25	5.03	N
OW-5D	15	15	5.99	5.03	Y
OW-5M	15	15	8.155	5.03	Y
OW-5S	15	15	7.67	5.03	Y
Park Moabi-4	2	2	25.9	5.03	Y
PE-1	2	4	0.623	5.03	N
PGE-6	4	4	3.90634	5.03	N
PGE-7	3	3	10.3868	5.03	Y

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
PGE-8	4	5	3.65796	5.03	N
PT-1D	2	2	2.27	5.03	N
PT-2D	2	2	1.84	5.03	N
PT-3D	2	2	3.33	5.03	N
PT-4D	2	2	4.7	5.03	N
PT-5D	1	2	4.86	5.03	N
PT-6D	2	2	2.5	5.03	N
PT-7D	1	1	7.41	5.03	Y
PT-7M	1	1	25.2	5.03	Y
PT-7S	1	1	22	5.03	Y
PT-8D	1	1	9.72	5.03	Y
PT-8M	1	1	31.8	5.03	Y
PT-8S	1	1	25.1	5.03	Y
PT-9D	1	1	9.3	5.03	Y
PT-9M	1	1	24.6	5.03	Y
PT-9S	1	1	16.4	5.03	Y
PTI-1D	1	2	2.53	5.03	N
PTR-1	1	1	18.4	5.03	Y
PTR-2	1	1	25.8	5.03	Y
TW-1	1	1	5.42	5.03	Y
TW-2D	4	4	5.02	5.03	N
TW-2S	2	2	6.71	5.03	Y
TW-3D	2	2	4.87	5.03	N
TW-4	1	1	1.43	5.03	N
TW-5	1	1	0.542	5.03	N
Selenium					
CW-1D	3	8	0.0052	0.0103	N
CW-1M	2	8	0.00193	0.0103	N
CW-2D	2	8	0.00229	0.0103	N
CW-3D	1	8	0.00184	0.0103	N
CW-4D	2	8	0.0053	0.0103	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
CW-4M	2	8	0.0011	0.0103	N
MW-1	2	2	0.00348	0.0103	N
MW-10	10	14	0.02	0.0103	Y
MW-11	7	10	0.0136	0.0103	Y
MW-12	11	17	0.008	0.0103	N
MW-13	1	2	0.00396	0.0103	N
MW-14	2	2	0.00426	0.0103	N
MW-15	1	1	0.00458	0.0103	N
MW-19	1	1	0.00421	0.0103	N
MW-20-130	11	12	0.023	0.0103	Y
MW-20-70	9	13	0.0181	0.0103	Y
MW-21	4	4	0.038	0.0103	Y
MW-23	4	4	0.0109	0.0103	Y
MW-24A	2	3	0.0507	0.0103	Y
MW-24B	1	1	0.0143	0.0103	Y
MW-25	7	10	0.0131	0.0103	Y
MW-26	3	3	0.0168	0.0103	Y
MW-3	2	2	0.00884	0.0103	N
MW-31-60	1	2	0.00294	0.0103	N
MW-32-35	1	3	0.0071	0.0103	N
MW-33-90	1	1	0.00106	0.0103	N
MW-34-55	1	9	0.0125	0.0103	Y
MW-35-135	2	2	0.00127	0.0103	N
MW-35-60	1	1	0.00119	0.0103	N
MW-37D	10	13	0.01	0.0103	N
MW-37S	1	1	0.00137	0.0103	N
MW-38S	1	1	0.0051	0.0103	N
MW-4	2	2	0.00391	0.0103	N
MW-40D	1	1	0.00212	0.0103	N
MW-40S	1	1	0.00737	0.0103	N
MW-47-55	1	1	0.00146	0.0103	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-48	1	3	0.00524	0.0103	N
MW-5	2	2	0.0203	0.0103	Y
MW-50-200	2	3	0.0102	0.0103	N
MW-51	3	3	0.0182	0.0103	Y
MW-6	2	2	0.00144	0.0103	N
MW-7	2	2	0.00747	0.0103	N
MW-8	2	2	0.00667	0.0103	N
MW-9	2	2	0.0132	0.0103	Y
OW-1D	2	15	0.00223	0.0103	N
OW-1M	3	14	0.0052	0.0103	N
OW-1S	3	13	0.0059	0.0103	N
OW-2D	5	14	0.0171	0.0103	Y
OW-2M	3	13	0.0065	0.0103	N
OW-2S	4	13	0.0068	0.0103	N
OW-3M	1	3	0.00103	0.0103	N
OW-3S	1	2	0.00226	0.0103	N
OW-5D	2	14	0.00246	0.0103	N
OW-5M	3	14	0.0186	0.0103	Y
OW-5S	3	14	0.00294	0.0103	N
Park Moabi-4	1	1	0.00145	0.0103	N
TW-1	4	4	0.155	0.0103	Y
TW-2D	2	3	0.01	0.0103	N
TW-2S	1	3	0.02	0.0103	Y
Silver					
MW-10	1	14	0.0618	0.00213	Y
MW-34-55	1	9	0.0404	0.00213	Y
MW-9	1	1	0.0059	0.00213	Y
OW-2D	1	14	0.0085	0.00213	Y
OW-5M	1	14	0.02	0.00213	Y
OW-5S	1	14	0.0649	0.00213	Y
TW-1	2	4	0.0873	0.00213	Y

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
Thallium					
CW-3D	1	7	0.0012	0.000908	Y
MW-12	1	17	0.00111	0.000908	Y
Vanadium					
CW-1D	6	7	0.0893	0.0599	Y
CW-1M	6	7	0.0977	0.0599	Y
CW-2D	6	7	0.121	0.0599	Y
CW-2M	6	7	0.124	0.0599	Y
CW-3D	6	7	0.115	0.0599	Y
CW-3M	6	7	0.0983	0.0599	Y
CW-4D	6	7	0.109	0.0599	Y
CW-4M	6	7	0.0953	0.0599	Y
MW-1	2	2	0.0406	0.0599	N
MW-10	17	17	0.165	0.0599	Y
MW-11	13	13	0.0859	0.0599	Y
MW-12	20	20	0.218	0.0599	Y
MW-13	5	5	0.00644	0.0599	N
MW-14	5	5	0.016	0.0599	N
MW-15	4	4	0.027	0.0599	N
MW-19	3	3	0.00502	0.0599	N
MW-20-100	3	4	0.05	0.0599	N
MW-20-130	11	15	0.172	0.0599	Y
MW-20-70	15	16	0.117	0.0599	Y
MW-21	3	6	0.0121	0.0599	N
MW-22	2	6	0.179	0.0599	Y
MW-23	2	6	0.016	0.0599	N
MW-24A	4	5	0.0273	0.0599	N
MW-24B	2	3	0.00821	0.0599	N
MW-24BR	1	2	0.0023	0.0599	N
MW-25	11	13	0.0733	0.0599	Y
MW-26	4	6	0.017	0.0599	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-27-20	2	3	0.021	0.0599	N
MW-28-25	2	3	0.016	0.0599	N
MW-29	2	3	0.014	0.0599	N
MW-3	2	2	0.0374	0.0599	N
MW-30-30	1	4	0.2	0.0599	Y
MW-31-135	1	1	0.0108	0.0599	N
MW-31-60	4	5	0.118	0.0599	Y
MW-33-210	1	1	0.00179	0.0599	N
MW-33-90	1	1	0.00525	0.0599	N
MW-34-100	2	2	0.00215	0.0599	N
MW-34-55	5	9	0.227	0.0599	Y
MW-34-80	10	13	0.238	0.0599	Y
MW-35-135	2	2	0.00184	0.0599	N
MW-35-60	1	1	0.00311	0.0599	N
MW-37D	11	13	0.326	0.0599	Y
MW-37S	1	1	0.00899	0.0599	N
MW-38D	1	1	0.00615	0.0599	N
MW-38S	1	1	0.0188	0.0599	N
MW-39-60	1	1	0.00927	0.0599	N
MW-4	2	2	0.0236	0.0599	N
MW-40D	1	1	0.00549	0.0599	N
MW-40S	1	1	0.00921	0.0599	N
MW-44-115	3	3	0.0071	0.0599	N
MW-45-095a	1	1	0.00614	0.0599	N
MW-46-175	1	1	0.00356	0.0599	N
MW-47-55	1	1	0.0024	0.0599	N
MW-48	2	3	0.0173	0.0599	N
MW-5	2	2	0.0235	0.0599	N
MW-6	2	2	0.0472	0.0599	N
MW-7	2	2	0.0387	0.0599	N
MW-8	2	2	0.0226	0.0599	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-9	5	5	0.014	0.0599	N
OW-1D	14	15	0.122	0.0599	Y
OW-1M	12	14	0.0625	0.0599	Y
OW-1S	10	13	0.0564	0.0599	N
OW-2D	10	14	0.0862	0.0599	Y
OW-2M	11	13	0.0913	0.0599	Y
OW-2S	13	13	0.0382	0.0599	N
OW-3D	1	1	0.0084	0.0599	N
OW-3M	3	3	0.0095	0.0599	N
OW-3S	2	2	0.0087	0.0599	N
OW-5D	11	14	0.0966	0.0599	Y
OW-5M	12	14	0.122	0.0599	Y
OW-5S	13	14	0.0415	0.0599	N
Park Moabi-4	1	1	0.00157	0.0599	N
PGE-6	1	3	0.007	0.0599	N
PGE-7	1	2	0.0012	0.0599	N
TW-1	3	4	0.0138	0.0599	N
TW-2D	2	3	0.016	0.0599	N
TW-2S	1	3	0.0109	0.0599	N
Zinc					
CW-1D	4	8	0.113	0.0777	Y
CW-1M	3	8	0.248	0.0777	Y
CW-2D	2	8	0.0522	0.0777	N
CW-2M	3	8	0.215	0.0777	Y
CW-3D	1	8	0.0276	0.0777	N
CW-3M	3	8	0.0617	0.0777	N
CW-4D	2	8	0.0323	0.0777	N
CW-4M	2	8	0.0316	0.0777	N
MW-1	4	5	0.0728	0.0777	N
MW-10	28	39	0.637	0.0777	Y
MW-11	26	35	0.45	0.0777	Y

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-12	30	41	0.54	0.0777	Y
MW-13	23	27	0.451	0.0777	Y
MW-14	24	26	0.498	0.0777	Y
MW-15	21	24	0.419	0.0777	Y
MW-19	19	22	0.398	0.0777	Y
MW-20-100	21	23	0.486	0.0777	Y
MW-20-130	27	34	0.445	0.0777	Y
MW-20-70	28	36	0.53	0.0777	Y
MW-21	20	25	0.692	0.0777	Y
MW-22	22	27	0.734	0.0777	Y
MW-23	22	26	0.817	0.0777	Y
MW-24A	21	25	0.62	0.0777	Y
MW-24B	20	23	0.468	0.0777	Y
MW-24BR	19	22	0.152	0.0777	Y
MW-25	23	29	0.555	0.0777	Y
MW-26	23	25	0.514	0.0777	Y
MW-27-20	18	22	0.44	0.0777	Y
MW-28-25	19	21	0.286	0.0777	Y
MW-29	21	22	0.356	0.0777	Y
MW-3	3	5	0.06	0.0777	N
MW-30-30	18	22	0.597	0.0777	Y
MW-30-50	5	6	0.365	0.0777	Y
MW-31-60	21	23	0.274	0.0777	Y
MW-32-20	5	6	0.0857	0.0777	Y
MW-32-35	5	9	0.381	0.0777	Y
MW-33-40	4	6	0.171	0.0777	Y
MW-33-90	5	6	0.315	0.0777	Y
MW-34-100	2	2	0.0457	0.0777	N
MW-34-55	9	14	0.163	0.0777	Y
MW-34-80	9	18	0.0854	0.0777	Y
MW-35-135	1	2	0.0182	0.0777	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
MW-35-60	1	1	0.0233	0.0777	N
MW-37D	5	13	0.0918	0.0777	Y
MW-4	4	5	0.018	0.0777	N
MW-44-115	1	3	0.0383	0.0777	N
MW-45-095a	1	1	0.0422	0.0777	N
MW-5	3	5	0.0367	0.0777	N
MW-50-200	1	3	0.0317	0.0777	N
MW-51	1	3	0.0344	0.0777	N
MW-6	2	5	0.0378	0.0777	N
MW-7	3	5	0.018	0.0777	N
MW-8	3	5	0.0727	0.0777	N
MW-9	26	27	0.363	0.0777	Y
OW-1D	3	15	0.0383	0.0777	N
OW-1M	4	15	0.0461	0.0777	N
OW-1S	1	13	0.0264	0.0777	N
OW-2D	1	14	0.0174	0.0777	N
OW-2M	3	13	0.0388	0.0777	N
OW-2S	1	13	0.0333	0.0777	N
OW-3D	2	2	0.0712	0.0777	N
OW-3M	1	4	0.0303	0.0777	N
OW-3S	2	3	0.0309	0.0777	N
OW-5D	5	14	0.0367	0.0777	N
OW-5M	5	14	0.278	0.0777	Y
OW-5S	2	14	0.0256	0.0777	N
Park Moabi-4	1	1	0.605	0.0777	Y
PGE-6	16	17	1.5	0.0777	Y
PGE-7	15	15	0.125	0.0777	Y
PGE-8	17	17	0.82	0.0777	Y
TW-1	4	4	0.11	0.0777	Y
TW-2D	3	3	0.0287	0.0777	N

Table 4-1a. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Comparison of Maximum Concentrations to Background UTLs

Well	Number of Detections	Number of Samples	Maximum Detection (mg/L)	UTL (mg/L)	Maximum Detection Exceeds UTL?
TW-2S	2	3	0.217	0.0777	Y

Notes:

(1) UTLs obtained from Table 3-1, CH2M HILL (2008). "NA" indicates no UTL is available.

(a) Cadmium and mercury were not detected in background wells; therefore, UTLs were not calculated in CH2M HILL (2008).

(b) UTLs for fluoride and nitrate presented in the RFI/RI Volume 2 (CH2M HILL, 2009).

(2) Ammonia and ammonia as nitrogen are combined in this analysis.

(3) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

ICOPC = initial constituent of potential concern
mg/L = milligram(s) per liter
UTL = upper tolerance limit

Source:

CH2M HILL. 2008. Revised Groundwater Background Study Steps 3 and 4: Final Report of Results, PG&E Topock Compressor Station, Needles, California. July.

CH2M HILL. 2009. Revised Final RCRA Facility Investigation/Remedial Investigation Report Volume 2. Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, PG&E Topock Compressor Station, Needles, California. January.

Table 4-1b. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Background Population Comparison

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Median Test Conclusion	Include as COPC?
Arsenic										
MW-12	17	17	0.052	0.157	0.0243	0.106	Site > Background	MW	Site > Background	Y
Barium										
MW-11	14	11	0.028	0.22	0.195	0.0919	Inconclusive	Gehan	Site ≤ Background	Y
Chromium, hexavalent										
MW-10	37	37	0.755	4.57	0.0318	2.031	Site > Background	Gehan	Site > Background	Y
MW-11	34	34	0.02	1.71	0.0318	0.86	Site > Background	Gehan	Site > Background	Y
MW-12	40	40	0.311	2.97	0.0318	1.339	Site > Background	Gehan	Site > Background	Y
MW-14	37	36	0.01	0.099	0.0318	0.0437	Site > Background	Gehan	Site > Background	Y
MW-15	32	23	0.0076	0.05	0.0318	0.0163	Site ≤ Background	Gehan	Site > Background	Y
MW-19	34	34	0.557	1.39	0.0318	0.901	Site > Background	Gehan	Site > Background	Y
MW-20-100	37	37	1.35	10.4	0.0318	7.403	Site > Background	Gehan	Site > Background	Y
MW-20-130	38	38	3.66	14.4	0.0318	8.532	Site > Background	Gehan	Site > Background	Y
MW-20-70	39	39	2.4	13.2	0.0318	9.654	Site > Background	Gehan	Site > Background	Y
MW-23	36	14	0.0011	1.02	0.0318	0.0943	Site ≤ Background	Gehan	Site ≤ Background	N
MW-24A	32	32	2.48	4.3	0.0318	3.361	Site > Background	Gehan	Site > Background	Y
MW-24B	34	34	0.741	6.12	0.0318	4.92	Site > Background	Gehan	Site > Background	Y
MW-25	33	33	0.933	2.98	0.0318	2.363	Site > Background	Gehan	Site > Background	Y
MW-26	35	34	0.759	4.06	0.0318	3.729	Site > Background	Gehan	Site > Background	Y
MW-30-50	45	34	0.0185	3.76	0.0318	1.326	Site > Background	Gehan	Site > Background	Y
MW-31-135	14	14	0.0332	0.422	0.0318	0.284	Site > Background	Gehan	Site > Background	Y
MW-31-60	36	36	0.626	4.52	0.0318	3.879	Site > Background	Gehan	Site > Background	Y

Table 4-1b. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Background Population Comparison

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Median Test Conclusion	Include as COPC?
MW-34-100	79	79	0.0739	0.976	0.0318	0.712	Site > Background	Gehan	Site > Background	Y
MW-34-80	88	13	0.00086	0.111	0.0318	0.00731	Site ≤ Background	Gehan	Site ≤ Background	N
MW-35-135	14	13	0.0079	0.0354	0.0318	0.0262	Site ≤ Background	Gehan	Site > Background	Y
MW-35-60	13	13	0.0048	0.0351	0.0318	0.0372	Site ≤ Background	Gehan	Site > Background	Y
MW-36-100	51	51	0.157	2.98	0.0318	1.551	Site > Background	Gehan	Site > Background	Y
MW-36-90	39	38	0.002	3.66	0.0318	2.545	Site > Background	Gehan	Site > Background	Y
MW-37D	15	15	0.834	1.97	0.0318	1.575	Site > Background	Gehan	Site > Background	Y
MW-38D	11	11	0.0331	0.328	0.0318	0.219	Site > Background	Gehan	Site > Background	Y
MW-38S	11	11	0.332	0.964	0.0318	0.886	Site > Background	Gehan	Site > Background	Y
MW-39-100	41	41	1.66	12.9	0.0318	7.87	Site > Background	Gehan	Site > Background	Y
MW-39-50	18	12	0.0662	4.14	0.0318	1.682	Site > Background	Gehan	Site > Background	Y
MW-39-60	18	16	0.0011	3.81	0.0318	2.921	Site > Background	Gehan	Site > Background	Y
MW-39-70	27	27	0.0045	8.21	0.0318	4.29	Site > Background	Gehan	Site > Background	Y
MW-39-80	40	40	0.0433	10.9	0.0318	4.397	Site > Background	Gehan	Site > Background	Y
MW-40D	15	15	0.0076	0.112	0.0318	0.0833	Site > Background	Gehan	Site > Background	Y
MW-44-115	32	32	0.62	1.71	0.0318	1.346	Site > Background	Gehan	Site > Background	Y
MW-44-125	29	29	0.157	0.634	0.0318	0.378	Site > Background	Gehan	Site > Background	Y
MW-46-175	29	29	0.0779	0.287	0.0318	0.176	Site > Background	Gehan	Site > Background	Y
MW-47-55	8	8	0.0109	0.0619	0.0318	0.0548	Site > Background	Gehan	Site > Background	Y
MW-50-095	8	8	0.164	0.304	0.0318	0.273	Site > Background	Gehan	Site > Background	Y
MW-50-200	8	8	5.81	12.3	0.0318	10.89	Site > Background	Gehan	Site > Background	Y
MW-9	35	35	0.265	0.402	0.0318	0.348	Site > Background	Gehan	Site > Background	Y

Table 4-1b. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Background Population Comparison

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Median Test Conclusion	Include as COPC?
OW-2S	16	15	0.0153	0.0404	0.0318	0.0397	Site > Background	Gehan	Site > Background	Y
OW-5S	16	16	0.0223	0.0326	0.0318	0.0267	Site ≤ Background	Gehan	Site > Background	Y
PE-1	24	21	0.0471	0.148	0.0318	0.1	Site > Background	Gehan	Site > Background	Y
PGE-6	18	13	0.16	3.1	0.0318	1.183	Site > Background	Gehan	Site > Background	Y
PGE-7	16	15	0.827	5.4	0.0318	5.581	Site > Background	Gehan	Site > Background	Y
TW-2D	12	12	0.21	7.41	0.0318	5.507	Site > Background	Gehan	Site > Background	Y
TW-2S	10	10	1.25	7.19	0.0318	4.867	Site > Background	Gehan	Site > Background	Y
TW-3D	22	22	1.93	4.33	0.0318	2.838	Site > Background	Gehan	Site > Background	Y
Cobalt										
MW-34-80	13	5	0.00108	0.00139	0.000843	0.0013	Inconclusive	Gehan	Site > Background	Y
Copper										
MW-10	39	16	0.00118	0.026	0.0105	0.00491	Inconclusive	Gehan	Site ≤ Background	Y
MW-11	35	12	0.00122	0.019	0.0105	0.00483	Inconclusive	Gehan	Site ≤ Background	Y
MW-12	41	14	0.0013	0.018	0.0105	0.00493	Inconclusive	Gehan	Site ≤ Background	Y
MW-13	27	11	0.0016	0.011	0.0105	0.00649	Inconclusive	Gehan	Site > Background	Y
MW-14	26	12	0.00348	0.0297	0.0105	0.00799	Inconclusive	Gehan	Site > Background	Y
MW-15	24	7	0.00111	0.019	0.0105	0.00932	Inconclusive	Gehan	Site ≤ Background	Y
MW-19	22	6	0.0016	0.0126	0.0105	0.00654	Inconclusive	Gehan	Site ≤ Background	Y
MW-20-100	23	10	0.002	0.05	0.0105	0.0115	Inconclusive	Gehan	Site > Background	Y
MW-20-130	34	10	0.00162	0.1	0.0105	0.0118	Inconclusive	Gehan	Site ≤ Background	Y
MW-20-70	36	16	0.00107	0.0785	0.0105	0.0108	Inconclusive	Gehan	Site ≤ Background	Y
MW-21	25	17	0.0047	0.111	0.0105	0.0269	Inconclusive	Gehan	Site > Background	Y

Table 4-1b. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Background Population Comparison

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Median Test Conclusion	Include as COPC?
MW-22	27	14	0.0033	0.2	0.0105	0.0779	Inconclusive	Gehan	Site > Background	Y
MW-23	26	10	0.0031	0.1	0.0105	0.0185	Inconclusive	Gehan	Site > Background	Y
MW-24A	25	10	0.0027	0.076	0.0105	0.0141	Inconclusive	Gehan	Site > Background	Y
MW-24B	23	8	0.0026	0.019	0.0105	0.00649	Inconclusive	Gehan	Site ≤ Background	Y
MW-24BR	22	8	0.0025	0.0655	0.0105	0.0153	Inconclusive	Gehan	Site > Background	Y
MW-25	29	7	0.00134	0.02	0.0105	0.0076	Inconclusive	Gehan	Site ≤ Background	Y
MW-26	25	13	0.0037	0.0342	0.0105	0.00939	Inconclusive	Gehan	Site > Background	Y
MW-27-20	22	11	0.0033	0.0961	0.0105	0.0189	Inconclusive	Gehan	Site > Background	Y
MW-28-25	21	10	0.0032	0.0269	0.0105	0.00875	Inconclusive	Gehan	Site > Background	Y
MW-29	22	12	0.0031	0.0187	0.0105	0.00976	Inconclusive	Gehan	Site > Background	Y
MW-30-30	22	11	0.0023	0.2	0.0105	0.0347	Inconclusive	Gehan	Site > Background	Y
MW-31-60	23	7	0.0037	0.05	0.0105	0.0148	Inconclusive	Gehan	Site > Background	Y
MW-9	27	17	0.0024	0.0167	0.0105	0.00734	Inconclusive	Gehan	Site > Background	Y
OW-5M	14	5	0.0016	0.0114	0.0105	0.00694	Site ≤ Background	Gehan	Site ≤ Background	N
PGE-6	17	10	0.0034	0.047	0.0105	0.0144	Site > Background	Gehan	Site > Background	Y
Fluoride										
CW-2D	8	7	0.982	7.26	7.12	4.364	Site > Background	Gehan	Site > Background	Y
Lead										
MW-10	17	6	0.00106	0.008	0.00191	0.00249	Inconclusive	Gehan	Site > Background	Y
Molybdenum										
CW-1D	8	8	0.012	0.0518	0.0363	0.0404	Site > Background	MW	Site > Background	Y
CW-2D	8	8	0.0339	0.0732	0.0363	0.0613	Site > Background	MW	Site > Background	Y

Table 4-1b. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Background Population Comparison

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Median Test Conclusion	Include as COPC?
CW-3D	8	8	0.0292	0.0882	0.0363	0.0653	Site > Background	MW	Site > Background	Y
CW-3M	8	8	0.0154	0.0378	0.0363	0.0298	Site ≤ Background	MW	Site > Background	Y
CW-4D	8	8	0.0218	0.0442	0.0363	0.0421	Site > Background	MW	Site > Background	Y
MW-10	17	17	0.0683	0.301	0.0363	0.167	Site > Background	MW	Site > Background	Y
MW-12	20	20	0.019	0.087	0.0363	0.0543	Site > Background	MW	Site > Background	Y
MW-20-130	15	15	0.018	0.0576	0.0363	0.0478	Site > Background	MW	Site > Background	Y
MW-3	12	11	0.025	0.041	0.0363	0.0342	Inconclusive	Gehan	Site > Background	Y
MW-37D	13	13	0.034	0.0518	0.0363	0.0472	Site > Background	MW	Site > Background	Y
MW-5	12	11	0.039	0.15	0.0363	0.0913	Site > Background	Gehan	Site > Background	Y
OW-1D	17	17	0.0088	0.0518	0.0363	0.0324	Site > Background	MW	Site > Background	Y
OW-2D	16	16	0.0082	0.0665	0.0363	0.0413	Site > Background	MW	Site > Background	Y
OW-2S	15	15	0.029	0.0893	0.0363	0.0476	Site > Background	MW	Site > Background	Y
OW-5D	16	16	0.0118	0.0838	0.0363	0.0477	Site > Background	MW	Site > Background	Y
OW-5M	16	16	0.0098	0.0501	0.0363	0.0316	Site > Background	MW	Site > Background	Y
Nickel										
MW-10	39	20	0.00165	0.033	0.0106	0.00665	Inconclusive	Gehan	Site > Background	Y
MW-11	35	16	0.00096	0.0203	0.0106	0.00695	Inconclusive	Gehan	Site > Background	Y
MW-12	41	20	0.0013	0.0179	0.0106	0.00632	Inconclusive	Gehan	Site > Background	Y
MW-13	27	19	0.0035	0.168	0.0106	0.027	Inconclusive	Gehan	Site > Background	Y
MW-14	26	17	0.0013	0.0397	0.0106	0.0134	Inconclusive	Gehan	Site > Background	Y
MW-15	24	14	0.0014	0.028	0.0106	0.00787	Inconclusive	Gehan	Site > Background	Y
MW-19	22	10	0.0012	0.0202	0.0106	0.00757	Inconclusive	Gehan	Site > Background	Y

Table 4-1b. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Background Population Comparison

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Median Test Conclusion	Include as COPC?
MW-20-100	23	13	0.0011	0.13	0.0106	0.0228	Inconclusive	Gehan	Site > Background	Y
MW-20-130	34	14	0.00079	0.25	0.0106	0.0326	Inconclusive	Gehan	Site > Background	Y
MW-20-70	36	15	0.0012	0.029	0.0106	0.00697	Inconclusive	Gehan	Site > Background	Y
MW-21	25	20	0.0017	0.158	0.0106	0.0491	Site > Background	Gehan	Site > Background	Y
MW-22	27	17	0.0013	0.5	0.0106	0.15	Inconclusive	Gehan	Site > Background	Y
MW-23	26	15	0.0015	0.25	0.0106	0.0823	Site > Background	Gehan	Site > Background	Y
MW-24A	25	11	0.0013	0.0225	0.0106	0.00658	Inconclusive	Gehan	Site > Background	Y
MW-24B	23	12	0.00069	0.053	0.0106	0.0124	Inconclusive	Gehan	Site > Background	Y
MW-24BR	22	11	0.0017	0.0172	0.0106	0.00757	Inconclusive	Gehan	Site > Background	Y
MW-25	29	15	0.00122	0.0213	0.0106	0.00577	Inconclusive	Gehan	Site > Background	Y
MW-26	25	11	0.0014	0.0183	0.0106	0.00994	Inconclusive	Gehan	Site > Background	Y
MW-27-20	22	12	0.0014	0.11	0.0106	0.0466	Inconclusive	Gehan	Site > Background	Y
MW-28-25	21	10	0.0022	0.0206	0.0106	0.00893	Inconclusive	Gehan	Site > Background	Y
MW-29	22	14	0.0015	0.0213	0.0106	0.0102	Inconclusive	Gehan	Site > Background	Y
MW-30-30	22	15	0.0017	0.5	0.0106	0.261	Inconclusive	Gehan	Site > Background	Y
MW-31-60	23	12	0.0017	0.13	0.0106	0.0441	Inconclusive	Gehan	Site > Background	Y
MW-34-55	14	6	0.00122	0.0223	0.0106	0.0106	Inconclusive	Gehan	Site > Background	Y
MW-34-80	18	11	0.001	0.0222	0.0106	0.00814	Inconclusive	Gehan	Site > Background	Y
MW-9	27	15	0.0014	0.0297	0.0106	0.00801	Inconclusive	Gehan	Site > Background	Y
PGE-6	17	10	0.00091	0.014	0.0106	0.00628	Inconclusive	Gehan	Site > Background	Y
PGE-7	15	9	0.0015	0.015	0.0106	0.00773	Inconclusive	Gehan	Site > Background	Y
PGE-8	17	9	0.0012	0.045	0.0106	0.0133	Inconclusive	Gehan	Site > Background	Y

Table 4-1b. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Background Population Comparison

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Median Test Conclusion	Include as COPC?
Nitrate as nitrogen										
CW-3M	8	8	0.594	5.98	5.03	4.252	Site > Background	Gehan	Site ≤ Background	Y
MW-11	8	8	0.51934	16.4	5.03	10.44	Site > Background	Gehan	Site > Background	Y
MW-14	8	8	1.10642	5.74	5.03	7.285	Site > Background	Gehan	Site > Background	Y
MW-20-100	19	19	2.9354	23.2	5.03	14.09	Site > Background	Gehan	Site > Background	Y
MW-20-130	19	19	6.0966	20.4	5.03	11.36	Site > Background	Gehan	Site > Background	Y
MW-20-70	20	20	2.4838	25.1	5.03	12.36	Site > Background	Gehan	Site > Background	Y
MW-24B	8	8	3.1612	16	5.03	13.99	Site > Background	Gehan	Site > Background	Y
MW-26	17	17	1.33222	7.84	5.03	5.366	Site > Background	Gehan	Site > Background	Y
MW-31-60	17	17	1.78382	6.2	5.03	5.008	Site > Background	Gehan	Site > Background	Y
OW-1M	16	16	0.892	6.49	5.03	3.24	Site ≤ Background	Gehan	Site ≤ Background	N
OW-2D	15	14	0.107	7.57	5.03	4.839	Site ≤ Background	Gehan	Site > Background	Y
OW-2M	15	15	0.574	7.16	5.03	3.519	Site ≤ Background	Gehan	Site > Background	Y
OW-2S	14	14	3.24	7.75	5.03	4.932	Site > Background	Gehan	Site > Background	Y
OW-5D	15	15	0.151	5.99	5.03	2.861	Site ≤ Background	Gehan	Site ≤ Background	N
OW-5M	15	15	0.51	8.155	5.03	2.944	Site ≤ Background	Gehan	Site ≤ Background	N
OW-5S	15	15	1.74	7.67	5.03	4.499	Site > Background	Gehan	Site > Background	Y
Selenium										
MW-10	14	10	0.00193	0.02	0.0103	0.00752	Site ≤ Background	Gehan	Site > Background	Y
MW-11	10	7	0.0045	0.0136	0.0103	0.00814	Site ≤ Background	Gehan	Site > Background	Y
MW-20-130	12	11	0.0107	0.023	0.0103	0.0158	Site > Background	Gehan	Site > Background	Y
MW-20-70	13	9	0.00782999	0.0181	0.0103	0.0118	Site ≤ Background	Gehan	Site > Background	Y
MW-25	10	7	0.00204	0.0131	0.0103	0.00569	Site ≤ Background	Gehan	Site > Background	Y
OW-2D	14	5	0.00208	0.0171	0.0103	0.00724	Site ≤ Background	Gehan	Site ≤ Background	N

Table 4-1b. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Background Population Comparison

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Median Test Conclusion	Include as COPC?
Vanadium										
MW-10	17	17	0.02	0.165	0.0599	0.059	Site ≤ Background	Gehan	Site > Background	Y
MW-11	13	13	0.0036	0.0859	0.0599	0.0413	Site ≤ Background	Gehan	Site ≤ Background	N
MW-12	20	20	0.009	0.218	0.0599	0.0821	Site ≤ Background	Gehan	Site > Background	Y
MW-20-130	15	11	0.0028	0.172	0.0599	0.101	Site > Background	Gehan	Site ≤ Background	Y
MW-20-70	16	15	0.0034	0.117	0.0599	0.0578	Site > Background	Gehan	Site ≤ Background	Y
MW-25	13	11	0.0051	0.0733	0.0599	0.036	Site ≤ Background	Gehan	Site ≤ Background	N
MW-34-55	9	5	0.00115	0.227	0.0599	0.289	Site > Background	Gehan	Site ≤ Background	Y
MW-34-80	13	10	0.0016	0.238	0.0599	0.204	Site ≤ Background	Gehan	Site ≤ Background	N
MW-37D	13	11	0.004	0.326	0.0599	0.187	Site ≤ Background	Gehan	Site ≤ Background	N
OW-1D	15	14	0.00169	0.122	0.0599	0.0752	Site > Background	Gehan	Site ≤ Background	Y
OW-1M	14	12	0.00184	0.0625	0.0599	0.0376	Site ≤ Background	Gehan	Site ≤ Background	N
OW-2D	14	10	0.00148	0.0862	0.0599	0.0455	Site ≤ Background	Gehan	Site ≤ Background	N
OW-2M	13	11	0.0021	0.0913	0.0599	0.0489	Site ≤ Background	Gehan	Site ≤ Background	N
OW-5D	14	11	0.00166	0.0966	0.0599	0.0715	Site > Background	Gehan	Site ≤ Background	Y
OW-5M	14	12	0.00181	0.122	0.0599	0.0608	Site > Background	Gehan	Site ≤ Background	Y
Zinc										
MW-10	39	28	0.0053	0.637	0.0777	0.183	Site > Background	Gehan	Site ≤ Background	Y
MW-11	35	26	0.0053	0.45	0.0777	0.179	Site > Background	Gehan	Site ≤ Background	Y
MW-12	41	30	0.0046	0.54	0.0777	0.0689	Site ≤ Background	Gehan	Site ≤ Background	N
MW-13	27	23	0.0068	0.451	0.0777	0.216	Site > Background	Gehan	Site > Background	Y
MW-14	26	24	0.008	0.498	0.0777	0.177	Site > Background	Gehan	Site > Background	Y
MW-15	24	21	0.004	0.419	0.0777	0.19	Site > Background	Gehan	Site ≤ Background	Y
MW-19	22	19	0.011	0.398	0.0777	0.219	Site > Background	Gehan	Site > Background	Y
MW-20-100	23	21	0.0065	0.486	0.0777	0.192	Site > Background	Gehan	Site > Background	Y

Table 4-1b. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Background Population Comparison

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Median Test Conclusion	Include as COPC?
MW-20-130	34	27	0.0102	0.445	0.0777	0.108	Site > Background	Gehan	Site > Background	Y
MW-20-70	36	28	0.0112	0.53	0.0777	0.197	Site > Background	Gehan	Site > Background	Y
MW-21	25	20	0.0053	0.692	0.0777	0.326	Site > Background	Gehan	Site > Background	Y
MW-22	27	22	0.0068	0.734	0.0777	0.196	Site > Background	Gehan	Site > Background	Y
MW-23	26	22	0.0066	0.817	0.0777	0.265	Site > Background	Gehan	Site > Background	Y
MW-24A	25	21	0.0056	0.62	0.0777	0.212	Site > Background	Gehan	Site > Background	Y
MW-24B	23	20	0.0096	0.468	0.0777	0.232	Site > Background	Gehan	Site > Background	Y
MW-24BR	22	19	0.009	0.152	0.0777	0.0788	Site > Background	Gehan	Site > Background	Y
MW-25	29	23	0.0073	0.555	0.0777	0.166	Site > Background	Gehan	Site > Background	Y
MW-26	25	23	0.0088	0.514	0.0777	0.21	Site > Background	Gehan	Site > Background	Y
MW-27-20	22	18	0.0053	0.44	0.0777	0.179	Inconclusive	Gehan	Site ≤ Background	Y
MW-28-25	21	19	0.0053	0.286	0.0777	0.153	Inconclusive	Gehan	Site ≤ Background	Y
MW-29	22	21	0.0049	0.356	0.0777	0.168	Site > Background	Gehan	Site > Background	Y
MW-30-30	22	18	0.008	0.597	0.0777	0.179	Site > Background	Gehan	Site ≤ Background	Y
MW-31-60	23	21	0.0073	0.274	0.0777	0.151	Site > Background	Gehan	Site > Background	Y
MW-32-35	9	5	0.0398	0.381	0.0777	0.316	Site > Background	Gehan	Site > Background	Y
MW-34-55	14	9	0.0141	0.163	0.0777	0.0612	Site ≤ Background	Gehan	Site ≤ Background	N
MW-34-80	18	9	0.0232	0.0854	0.0777	0.0465	Site ≤ Background	Gehan	Site ≤ Background	N
MW-37D	13	5	0.011	0.0918	0.0777	0.0407	Site ≤ Background	Gehan	Site ≤ Background	N
MW-9	27	26	0.0034	0.363	0.0777	0.206	Site > Background	Gehan	Site > Background	Y
OW-5M	14	5	0.0238	0.278	0.0777	0.0964	Site ≤ Background	Gehan	Site ≤ Background	N
PGE-6	17	16	0.0067	1.5	0.0777	0.674	Site > Background	Gehan	Site > Background	Y
PGE-7	15	15	0.01	0.125	0.0777	0.0522	Site ≤ Background	Gehan	Site > Background	Y
PGE-8	17	17	0.015	0.82	0.0777	0.31	Site > Background	Gehan	Site > Background	Y

Table 4-1b. Well-Specific Statistical Summary of Groundwater ICOPCs in Site Groundwater – Background Population Comparison

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Median Test Conclusion	Include as COPC?

Notes:

(1) Data shown here have a detection above the background UTL and a minimum of eight samples and five detections.

(2) The quantile and a median test (either the Mann-Whitney or Gehan Test) were preformed in ProUCL to test the hypothesis that the distribution of concentrations at a given well are below the background distribution.

(3) 95% UCLs calculated in ProUCL.

(4) UTLs obtained from Table 3-1, CH2M HILL (2008). "NA" indicates no UTL was calculated.

(a) Cadmium and mercury were not detected in background wells; therefore, UTLs were not calculated in CH2M HILL (2008)

(b) A UTL was not calculated for fluoride and nitrate as nitrogen. UTLs for fluoride and nitrate presented in the RFI/RI Volume 2 (CH2M HILL, 2009).

(5) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

(6) Based on the ProUCL manual recommendations, the Gehan test is used for chemicals for which either the background or sample data sets have more than 40% nondetects or multiple detection limits. The Mann-Whitney test is used for all other cases.

(7) In performing the above statistical analyses, an erroneous Mann-Whitney conclusion was discovered affecting samples with more than 20 samples in exactly one of the two populations. As recommended by ProUCL developers, for these samples the Median Test conclusion is based on the p-value (personal communication, Narain Armbya).

(8) Inconclusive Quantile Test results occur when detection limits are high and there are too many nondetects in the upper tail of the distribution.

COPC = constituent of potential concern
ICOPC = initial constituent of potential concern
mg/L = milligram(s) per liter
UCL = upper confidence limit
UTL = upper tolerance limit

Source:

CH2M HILL. 2008. Revised Groundwater Background Study Steps 3 and 4: Final Report of Results, PG&E Topock Compressor Station, Needles, California. July.

CH2M HILL. 2009. Revised Final RCRA Facility Investigation/Remedial Investigation Report Volume 2. Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, PG&E Topock Compressor Station, Needles, California. January.

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
Aluminum						
CW-1D	8	1	0.118	0.118	NA	0.12
MW-1	2	1	0.0686	0.0686	NA	0.069
MW-10	6	2	0.0559	0.0645	NA	0.065
MW-12	6	1	0.0679	0.0679	NA	0.068
MW-3	2	1	0.0636	0.0636	NA	0.064
MW-34-80	6	1	0.0605	0.0605	NA	0.061
MW-4	2	1	0.0618	0.0618	NA	0.062
MW-5	2	1	0.0585	0.0585	NA	0.059
MW-6	2	1	0.0618	0.0618	NA	0.062
OW-1M	15	1	0.111	0.111	NA	0.11
OW-1S	13	1	0.118	0.118	NA	0.12
OW-2S	13	3	0.0567	0.152	NA	0.15
OW-5D	13	2	0.138	0.202	NA	0.20
OW-5M	13	1	0.749	0.749	NA	0.75
OW-5S	13	1	0.0991	0.0991	NA	0.099
TW-2S	3	1	0.141	0.141	NA	0.14
Antimony						
MW-10	15	1	0.0033	0.0033	NA	0.0033
MW-12	17	2	0.013	0.0209	NA	0.021
MW-20-100	1	1	0.043	0.043	NA	0.043
MW-20-70	13	1	0.0088	0.0088	NA	0.0088
MW-34-55	9	1	0.026	0.026	NA	0.026
OW-5M	14	1	0.0111	0.0111	NA	0.011
TW-2D	3	1	0.155	0.155	NA	0.16
TW-2S	3	1	0.153	0.153	NA	0.15
Arsenic						
MW-12	17	17	0.052	0.157	Y	0.11
MW-24A	4	3	0.0054	0.0336	NA	0.034
MW-43-25	3	3	0.0189	0.0244	NA	0.024
Barium						
MW-11	14	11	0.028	0.22	Y	0.092
MW-22	7	3	0.11	0.5	NA	0.50
MW-23	8	3	0.089	5.3	NA	5.3
MW-24A	7	4	0.026	0.944	NA	0.94
MW-24BR	4	3	0.19	0.3	NA	0.30

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-27-20	4	3	0.069	0.26	NA	0.26
MW-28-25	4	3	0.12	0.24	NA	0.24
MW-29	4	3	0.034	0.3	NA	0.30
MW-30-30	5	4	0.083	1.1	NA	1.1
MW-32-20	1	1	5.14	5.14	NA	5.1
Beryllium						
CW-1D	7	1	0.0024	0.0024	NA	0.0024
CW-2D	7	1	0.0024	0.0024	NA	0.0024
CW-3D	7	1	0.0024	0.0024	NA	0.0024
CW-3M	7	1	0.0019	0.0019	NA	0.0019
CW-4D	7	1	0.002	0.002	NA	0.0020
CW-4M	7	1	0.0016	0.0016	NA	0.0016
MW-43-25	3	1	0.0011	0.0011	NA	0.0011
OW-1D	15	2	0.0011	0.0028	NA	0.0028
OW-1M	14	2	0.0012	0.0025	NA	0.0025
OW-2D	14	2	0.0013	0.0023	NA	0.0023
OW-2M	13	2	0.0011	0.0023	NA	0.0023
OW-2S	13	1	0.0018	0.0018	NA	0.0018
OW-5D	14	2	0.0014	0.0025	NA	0.0025
OW-5M	14	2	0.0023	0.0088	NA	0.0088
OW-5M	14	1	0.0105	0.0105	NA	0.011
Chromium, hexavalent						
MW-10	37	37	0.755	4.57	Y	2.0
MW-11	34	34	0.02	1.71	Y	0.86
MW-12	40	40	0.311	2.97	Y	1.3
MW-14	37	36	0.01	0.099	Y	0.044
MW-15	32	23	0.0076	0.05	Y	0.016
MW-19	34	34	0.557	1.39	Y	0.90
MW-20-100	37	37	1.35	10.4	Y	7.4
MW-20-130	38	38	3.66	14.4	Y	8.5
MW-20-70	39	39	2.4	13.2	Y	9.7
MW-24A	32	32	2.48	4.3	Y	3.4
MW-24B	34	34	0.741	6.12	Y	4.9
MW-24BR	34	1	0.346	0.346	NA	0.35
MW-25	33	33	0.933	2.98	Y	2.4
MW-26	35	34	0.759	4.06	Y	3.7

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-30-50	45	34	0.0185	3.76	Y	1.3
MW-31-135	14	14	0.0332	0.422	Y	0.28
MW-31-60	36	36	0.626	4.52	Y	3.9
MW-34-100	79	79	0.0739	0.976	Y	0.71
MW-35-135	14	13	0.0079	0.0354	Y	0.026
MW-35-60	13	13	0.0048	0.0351	Y	0.037
MW-36-100	51	51	0.157	2.98	Y	1.6
MW-36-90	39	38	0.002	3.66	Y	2.5
MW-37D	15	15	0.834	1.97	Y	1.6
MW-38D	11	11	0.0331	0.328	Y	0.22
MW-38S	11	11	0.332	0.964	Y	0.89
MW-39-100	41	41	1.66	12.9	Y	7.9
MW-39-50	18	12	0.0662	4.14	Y	1.7
MW-39-60	18	16	0.0011	3.81	Y	2.9
MW-39-70	27	27	0.0045	8.21	Y	4.3
MW-39-80	40	40	0.0433	10.9	Y	4.4
MW-40D	15	15	0.0076	0.112	Y	0.083
MW-44-115	32	32	0.62	1.71	Y	1.3
MW-44-125	29	29	0.157	0.634	Y	0.38
MW-45-095a	3	3	0.169	0.259	NA	0.26
MW-46-175	29	29	0.0779	0.287	Y	0.18
MW-47-55	8	8	0.0109	0.0619	Y	0.055
MW-50-095	8	8	0.164	0.304	Y	0.27
MW-50-200	8	8	5.81	12.3	Y	11
MW-51	7	7	4.13	4.69	NA	4.7
MW-8	6	6	0.02	0.0509	NA	0.051
MW-9	35	35	0.265	0.402	Y	0.35
OW-2S	16	15	0.0153	0.0404	Y	0.040
OW-5S	16	16	0.0223	0.0326	Y	0.027
PE-1	24	21	0.0471	0.148	Y	0.10
PGE-6	18	13	0.16	3.1	Y	1.2
PGE-7	16	15	0.827	5.4	Y	5.6
PT-1D	2	2	2.47	3.08	NA	3.1
PT-2D	2	2	1.67	2.31	NA	2.3
PT-3D	2	2	4.39	4.44	NA	4.4
PT-4D	1	1	5.96	5.96	NA	6.0

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
PT-5D	2	1	6.15	6.15	NA	6.2
PT-6D	2	2	2.27	3.31	NA	3.3
PT-7D	1	1	7.26	7.26	NA	7.3
PT-7M	1	1	2.32	2.32	NA	2.3
PT-7S	1	1	1.2	1.2	NA	1.2
PT-8D	1	1	6.54	6.54	NA	6.5
PT-8M	1	1	3.96	3.96	NA	4.0
PT-8S	1	1	1.75	1.75	NA	1.8
PT-9D	1	1	15.7	15.7	NA	16
PT-9M	1	1	2.34	2.34	NA	2.3
PT-9S	1	1	1.18	1.18	NA	1.2
PTI-1D	1	1	3.35	3.35	NA	3.4
PTR-1	1	1	0.538	0.538	NA	0.54
PTR-2	1	1	3.19	3.19	NA	3.2
TW-1	3	3	3.82	4.61	NA	4.6
TW-2D	12	12	0.21	7.41	Y	5.5
TW-2S	10	10	1.25	7.19	Y	4.9
TW-3D	22	22	1.93	4.33	Y	2.8
TW-4	6	5	0.001	0.0355	NA	0.036
Chromium, total						
MW-1	9	6	0.004	0.23	Y	0.29
MW-10	38	38	0.473	4.9	Y	2.2
MW-11	35	35	0.07	1.7	Y	0.83
MW-12	41	41	0.34	2.93	Y	1.5
MW-13	36	35	0.01	0.18	Y	0.045
MW-14	36	36	0.0134	0.1	Y	0.037
MW-19	33	33	0.589	1.51	Y	0.91
MW-20-100	36	36	1.5	12.1	Y	7.8
MW-20-130	37	37	4.1	16.4	Y	8.9
MW-20-70	38	38	2.14	15.9	Y	11
MW-22	38	17	0.0015	0.4	Y	0.039
MW-23	38	23	0.0011	1.02	Y	0.21
MW-24A	34	34	0.01	4.26	Y	4.5
MW-24B	32	32	0.68	6.26	Y	4.9
MW-24BR	33	16	0.001	0.38	Y	0.042
MW-25	32	32	0.884	3.41	Y	2.4

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-26	37	37	0.76	5.02	Y	3.2
MW-3	9	8	0.0099	1.2	Y	1.5
MW-30-30	66	17	0.0011	0.4	Y	0.021
MW-30-50	51	39	0.0028	3.34	Y	1.8
MW-31-135	14	14	0.0294	0.407	Y	0.28
MW-31-60	35	35	0.638	5.62	Y	4.0
MW-34-100	79	79	0.11	1.19	Y	0.74
MW-34-80	92	23	0.0011	0.111	Y	0.0077
MW-35-135	14	13	0.0066	0.0392	Y	0.026
MW-35-60	14	14	0.0054	0.038	Y	0.032
MW-36-100	51	51	0.184	3.18	Y	1.5
MW-36-90	39	39	0.0018	3.45	Y	2.4
MW-37D	15	15	0.794	1.97	Y	1.5
MW-38D	11	11	0.0296	0.323	Y	0.21
MW-38S	11	11	0.373	1.01	Y	0.93
MW-39-100	41	41	1.69	13.7	Y	7.9
MW-39-50	18	13	0.0047	3.92	Y	1.6
MW-39-60	18	16	0.0027	3.61	Y	2.9
MW-39-70	28	28	0.0043	8.49	Y	4.3
MW-39-80	40	40	0.0452	12.9	Y	4.5
MW-4	9	9	0.0187	0.083	Y	0.049
MW-40D	15	15	0.0064	0.104	Y	0.078
MW-44-115	34	34	0.59	1.97	Y	1.4
MW-44-125	29	29	0.18	0.74	Y	0.41
MW-45-095a	3	3	0.14	0.216	NA	0.22
MW-46-175	29	29	0.0747	0.279	Y	0.18
MW-47-55	8	8	0.0079	0.082	Y	0.059
MW-5	9	9	0.0117	0.15	Y	0.10
MW-50-095	8	8	0.192	0.372	Y	0.29
MW-50-200	10	10	5.91	14.6	Y	12
MW-51	10	10	4.34	5.36	Y	4.9
MW-7	9	9	0.0134	0.19	Y	0.12
MW-8	9	9	0.033	0.1	Y	0.070
MW-9	34	34	0.287	0.46	Y	0.35
OW-2S	16	16	0.0034	0.0445	Y	0.043
PE-1	25	22	0.0397	0.293	Y	0.11

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
PGE-6	18	16	0.024	3.3	Y	1.8
PGE-7	16	15	0.742	6.78	Y	5.5
PT-1D	2	2	2.27	2.77	NA	2.8
PT-2D	2	2	1.58	2.17	NA	2.2
PT-3D	2	2	4.37	4.68	NA	4.7
PT-3S	2	2	0.00148	0.0403	NA	0.040
PT-4D	2	2	5.48	5.51	NA	5.5
PT-5D	2	1	5.65	5.65	NA	5.7
PT-6D	2	2	2.18	3.14	NA	3.1
PT-7D	1	1	7.89	7.89	NA	7.9
PT-7M	1	1	2.24	2.24	NA	2.2
PT-7S	1	1	1.26	1.26	NA	1.3
PT-8D	1	1	7.26	7.26	NA	7.3
PT-8M	1	1	4.12	4.12	NA	4.1
PT-8S	1	1	1.66	1.66	NA	1.7
PT-9D	1	1	15.6	15.6	NA	16
PT-9M	1	1	2.27	2.27	NA	2.3
PT-9S	1	1	1.15	1.15	NA	1.2
PTI-1D	2	2	1.58	3.37	NA	3.4
PTR-1	1	1	0.713	0.713	NA	0.71
PTR-2	1	1	3.38	3.38	NA	3.4
TW-1	6	6	2.45	4.34	NA	4.3
TW-2D	13	13	0.228	6.98	Y	5.4
TW-2S	10	10	1.22	6.82	Y	4.9
TW-3D	22	22	1.8	4.72	Y	2.9
TW-4	6	6	0.0041	0.0369	NA	0.037
Cobalt						
MW-14	2	1	0.00101	0.00101	NA	0.0010
MW-20-130	12	1	0.00109	0.00109	NA	0.0011
MW-22	3	1	0.005	0.005	NA	0.0050
MW-33-210	1	1	0.00126	0.00126	NA	0.0013
MW-34-80	13	5	0.00108	0.00139	Y	0.0013
MW-37D	13	2	0.00106	0.00117	NA	0.0012
OW-5M	14	1	0.01	0.01	NA	0.010
OW-5S	14	1	0.00125	0.00125	NA	0.0013

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
Copper						
CW-4D	8	1	0.0154	0.0154	NA	0.015
CW-4M	8	2	0.00389	0.0218	NA	0.022
MW-10	39	16	0.00118	0.026	Y	0.0049
MW-11	35	12	0.00122	0.019	Y	0.0048
MW-12	41	14	0.0013	0.018	Y	0.0049
MW-13	27	11	0.0016	0.011	Y	0.0065
MW-14	26	12	0.00348	0.0297	Y	0.0080
MW-15	24	7	0.00111	0.019	Y	0.0093
MW-19	22	6	0.0016	0.0126	Y	0.0065
MW-20-100	23	10	0.002	0.05	Y	0.012
MW-20-130	34	10	0.00162	0.1	Y	0.012
MW-20-70	36	16	0.00107	0.0785	Y	0.011
MW-21	25	17	0.0047	0.111	Y	0.027
MW-22	27	14	0.0033	0.2	Y	0.078
MW-23	26	10	0.0031	0.1	Y	0.019
MW-24A	25	10	0.0027	0.076	Y	0.014
MW-24B	23	8	0.0026	0.019	Y	0.0065
MW-24BR	22	8	0.0025	0.0655	Y	0.015
MW-25	29	7	0.00134	0.02	Y	0.0076
MW-26	25	13	0.0037	0.0342	Y	0.0094
MW-27-20	22	11	0.0033	0.0961	Y	0.019
MW-28-25	21	10	0.0032	0.0269	Y	0.0088
MW-29	22	12	0.0031	0.0187	Y	0.0098
MW-30-30	22	11	0.0023	0.2	Y	0.035
MW-30-50	6	1	0.0392	0.0392	NA	0.039
MW-31-60	23	7	0.0037	0.05	Y	0.015
MW-33-40	6	1	0.0189	0.0189	NA	0.019
MW-33-90	6	1	0.306	0.306	NA	0.31
MW-34-55	14	2	0.0066	0.012	NA	0.012
MW-34-80	18	4	0.0011	0.0106	NA	0.011
MW-8	5	2	0.00211	0.0114	NA	0.011
MW-9	27	17	0.0024	0.0167	Y	0.0073
OW-1D	15	3	0.00252	0.0216	NA	0.022
OW-1M	15	2	0.00241	0.021	NA	0.021
OW-2D	14	4	0.00103	0.0186	NA	0.019

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
OW-2M	13	1	0.0206	0.0206	NA	0.021
OW-5D	14	4	0.00294	0.015	NA	0.015
OW-5S	14	4	0.00114	0.015	NA	0.015
PGE-6	17	10	0.0034	0.047	Y	0.014
PGE-7	15	4	0.0026	0.0192	NA	0.019
Fluoride						
CW-2D	8	7	0.982	7.26	Y	4.4
MW-1	7	7	0.735	7.95	NA	8.0
MW-10	6	6	10	24.6	NA	25
MW-33-40	3	3	8.2	8.78	NA	8.8
MW-6	6	6	6.87	8.6	NA	8.6
Lead						
CW-1D	8	1	0.0036	0.0036	NA	0.0036
CW-1M	8	1	0.0054	0.0054	NA	0.0054
CW-2M	8	1	0.0067	0.0067	NA	0.0067
CW-3M	8	1	0.0029	0.0029	NA	0.0029
CW-4M	8	1	0.0055	0.0055	NA	0.0055
MW-10	17	6	0.00106	0.008	Y	0.0025
MW-11	13	3	0.00083	0.006	NA	0.0060
MW-12	20	4	0.001	0.0067	NA	0.0067
MW-14	6	3	0.00138	0.0026	NA	0.0026
MW-15	4	2	0.00127	0.0039	NA	0.0039
MW-20-100	4	2	0.00094	0.017	NA	0.017
MW-20-130	15	1	0.042	0.042	NA	0.042
MW-20-70	16	3	0.00137	0.003	NA	0.0030
MW-22	5	1	0.076	0.076	NA	0.076
MW-23	6	2	0.00426	0.027	NA	0.027
MW-26	6	1	0.0021	0.0021	NA	0.0021
MW-27-20	3	3	0.0017	0.024	NA	0.024
MW-28-25	3	2	0.0038	0.014	NA	0.014
MW-29	3	1	0.0033	0.0033	NA	0.0033
MW-30-30	4	2	0.067	0.073	NA	0.073
MW-31-60	5	1	0.021	0.021	NA	0.021
MW-34-55	9	1	0.0122	0.0122	NA	0.012
MW-43-25	3	1	0.0059	0.0059	NA	0.0059
MW-51	3	1	0.0058	0.0058	NA	0.0058

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-9	5	2	0.002	0.00317	NA	0.0032
OW-1M	15	1	0.0049	0.0049	NA	0.0049
OW-1S	13	2	0.0026	0.0047	NA	0.0047
OW-2D	14	2	0.0024	0.0029	NA	0.0029
OW-2M	13	1	0.0032	0.0032	NA	0.0032
OW-3D	2	1	0.0024	0.0024	NA	0.0024
OW-3S	3	1	0.0046	0.0046	NA	0.0046
OW-5D	14	1	0.0037	0.0037	NA	0.0037
OW-5M	14	1	0.0102	0.0102	NA	0.010
OW-5S	14	1	0.0028	0.0028	NA	0.0028
PGE-6	3	1	0.006	0.006	NA	0.0060
TW-1	4	1	0.0051	0.0051	NA	0.0051
Mercury						
MW-22	3	1	0.0004	0.0004	NA	0.00040
Molybdenum						
CW-1D	8	8	0.012	0.0518	Y	0.040
CW-2D	8	8	0.0339	0.0732	Y	0.061
CW-3D	8	8	0.0292	0.0882	Y	0.065
CW-3M	8	8	0.0154	0.0378	Y	0.030
CW-4D	8	8	0.0218	0.0442	Y	0.042
MW-1	12	3	0.0057	0.078	NA	0.078
MW-10	17	17	0.0683	0.301	Y	0.17
MW-12	20	20	0.019	0.087	Y	0.054
MW-20-130	15	15	0.018	0.0576	Y	0.048
MW-21	6	5	0.0239	0.052	NA	0.052
MW-22	6	5	0.031	0.0562	NA	0.056
MW-24A	5	5	0.011	0.0397	NA	0.040
MW-24B	3	3	0.053	0.0649	NA	0.065
MW-24BR	2	2	0.036	0.058	NA	0.058
MW-26	6	6	0.0288	0.043	NA	0.043
MW-3	12	11	0.025	0.041	Y	0.034
MW-30-30	4	2	0.011	0.1	NA	0.10
MW-33-90	1	1	0.0369	0.0369	NA	0.037
MW-34-100	2	2	0.0362	0.0367	NA	0.037
MW-37D	13	13	0.034	0.0518	Y	0.047
MW-38D	1	1	0.0797	0.0797	NA	0.080

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-38S	1	1	0.0637	0.0637	NA	0.064
MW-40D	1	1	0.0458	0.0458	NA	0.046
MW-44-115	3	3	0.0729	0.0856	NA	0.086
MW-44-125	1	1	0.125	0.125	NA	0.13
MW-46-175	1	1	0.196	0.196	NA	0.20
MW-5	12	11	0.039	0.15	Y	0.091
MW-50-200	3	3	0.0404	0.054	NA	0.054
MW-51	3	3	0.0336	0.04	NA	0.040
OW-1D	17	17	0.0088	0.0518	Y	0.032
OW-2D	16	16	0.0082	0.0665	Y	0.041
OW-2S	15	15	0.029	0.0893	Y	0.048
OW-3D	2	2	0.031	0.0437	NA	0.044
OW-5D	16	16	0.0118	0.0838	Y	0.048
OW-5M	16	16	0.0098	0.0501	Y	0.032
PGE-7	2	2	0.054	0.056	NA	0.056
PGE-8	3	3	0.056	0.078	NA	0.078
TW-2D	3	3	0.0332	0.05	NA	0.050
Nickel						
MW-1	5	4	0.00671	0.023	NA	0.023
MW-10	39	20	0.00165	0.033	Y	0.0067
MW-11	35	16	0.00096	0.0203	Y	0.0070
MW-12	41	20	0.0013	0.0179	Y	0.0063
MW-13	27	19	0.0035	0.168	Y	0.027
MW-14	26	17	0.0013	0.0397	Y	0.013
MW-15	24	14	0.0014	0.028	Y	0.0079
MW-19	22	10	0.0012	0.0202	Y	0.0076
MW-20-100	23	13	0.0011	0.13	Y	0.023
MW-20-130	34	14	0.00079	0.25	Y	0.033
MW-20-70	36	15	0.0012	0.029	Y	0.0070
MW-21	25	20	0.0017	0.158	Y	0.049
MW-22	27	17	0.0013	0.5	Y	0.15
MW-23	26	15	0.0015	0.25	Y	0.082
MW-24A	25	11	0.0013	0.0225	Y	0.0066
MW-24B	23	12	0.00069	0.053	Y	0.012
MW-24BR	22	11	0.0017	0.0172	Y	0.0076
MW-25	29	15	0.00122	0.0213	Y	0.0058

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-26	25	11	0.0014	0.0183	Y	0.0099
MW-27-20	22	12	0.0014	0.11	Y	0.047
MW-28-25	21	10	0.0022	0.0206	Y	0.0089
MW-29	22	14	0.0015	0.0213	Y	0.010
MW-3	5	5	0.0125	0.042	NA	0.042
MW-30-30	22	15	0.0017	0.5	Y	0.26
MW-31-60	23	12	0.0017	0.13	Y	0.044
MW-34-55	14	6	0.00122	0.0223	Y	0.011
MW-34-80	18	11	0.001	0.0222	Y	0.0081
MW-37D	13	4	0.0015	0.0254	NA	0.025
MW-4	5	5	0.00774	0.022	NA	0.022
MW-5	5	4	0.00497	0.02	NA	0.020
MW-7	5	5	0.00529	0.02	NA	0.020
MW-8	5	4	0.00246	0.016	NA	0.016
MW-9	27	15	0.0014	0.0297	Y	0.0080
OW-2D	14	3	0.00102	0.0135	NA	0.014
OW-5M	14	4	0.00128	0.0201	NA	0.020
PGE-6	17	10	0.00091	0.014	Y	0.0063
PGE-7	15	9	0.0015	0.015	Y	0.0077
PGE-8	17	9	0.0012	0.045	Y	0.013
Nitrate as nitrogen						
CW-3M	8	8	0.594	5.98	Y	4.3
MW-1	2	2	6.16	6.28	NA	6.3
MW-10	7	7	3.81602	16.1	NA	16
MW-11	8	8	0.51934	16.4	Y	10
MW-14	8	8	1.10642	5.74	Y	7.3
MW-15	7	7	0.72256	9.73	NA	9.7
MW-20-100	19	19	2.9354	23.2	Y	14
MW-20-130	19	19	6.0966	20.4	Y	11
MW-20-70	20	20	2.4838	25.1	Y	12
MW-22	8	3	2.9354	6.75142	NA	6.8
MW-24A	7	7	3.47732	18.3	NA	18
MW-24B	8	8	3.1612	16	Y	14
MW-26	17	17	1.33222	7.84	Y	5.4
MW-3	2	2	9	11	NA	11
MW-30-30	16	3	10.161	14.40604	NA	14

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-31-60	17	17	1.78382	6.2	Y	5.0
MW-38D	4	4	0.697	14.7	NA	15
MW-38S	4	4	8.73	10.5	NA	11
MW-39-100	4	3	2.68	9.8	NA	9.8
MW-39-50	3	1	6.3	6.3	NA	6.3
MW-39-60	4	1	6.3	6.3	NA	6.3
MW-39-70	4	1	9	9	NA	9.0
MW-39-80	4	3	0.931	8.9	NA	8.9
MW-4	2	2	5.49	6.28	NA	6.3
MW-40D	3	3	1	19.7	NA	20
MW-40S	3	3	4.6	6.6	NA	6.6
MW-44-125	2	2	1.72	6.43	NA	6.4
MW-5	2	2	14.8	18.9	NA	19
MW-50-200	1	1	6.06	6.06	NA	6.1
MW-51	1	1	14.1	14.1	NA	14
MW-7	2	2	7.06	7.83	NA	7.8
MW-8	2	2	15	20.5	NA	21
MW-9	7	7	1.62576	22.6	NA	23
OW-2D	15	14	0.107	7.57	Y	4.8
OW-2M	15	15	0.574	7.16	Y	3.5
OW-2S	14	14	3.24	7.75	Y	4.9
OW-5S	15	15	1.74	7.67	Y	4.5
Park Moabi-4	2	2	2.8	25.9	NA	26
PGE-7	3	3	5.1934	10.3868	NA	10
PT-7D	1	1	7.41	7.41	NA	7.4
PT-7M	1	1	25.2	25.2	NA	25
PT-7S	1	1	22	22	NA	22
PT-8D	1	1	9.72	9.72	NA	9.7
PT-8M	1	1	31.8	31.8	NA	32
PT-8S	1	1	25.1	25.1	NA	25
PT-9D	1	1	9.3	9.3	NA	9.3
PT-9M	1	1	24.6	24.6	NA	25
PT-9S	1	1	16.4	16.4	NA	16
PTR-1	1	1	18.4	18.4	NA	18
PTR-2	1	1	25.8	25.8	NA	26
TW-1	1	1	5.42	5.42	NA	5.4

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
TW-2S	2	2	5.3	6.71	NA	6.7
Selenium						
MW-10	14	10	0.00193	0.02	Y	0.0075
MW-11	10	7	0.0045	0.0136	Y	0.0081
MW-20-130	12	11	0.0107	0.023	Y	0.016
MW-20-70	13	9	0.007829999	0.0181	Y	0.012
MW-21	4	4	0.012	0.038	NA	0.038
MW-23	4	4	0.00544	0.0109	NA	0.011
MW-24A	3	2	0.00529	0.0507	NA	0.051
MW-24B	1	1	0.0143	0.0143	NA	0.014
MW-25	10	7	0.00204	0.0131	Y	0.0057
MW-26	3	3	0.0144	0.0168	NA	0.017
MW-34-55	9	1	0.0125	0.0125	NA	0.013
MW-5	2	2	0.0173	0.0203	NA	0.020
MW-51	3	3	0.0115	0.0182	NA	0.018
MW-9	2	2	0.00622	0.0132	NA	0.013
OW-5M	14	3	0.00236	0.0186	NA	0.019
TW-1	4	4	0.0553	0.155	NA	0.16
TW-2S	3	1	0.02	0.02	NA	0.020
Silver						
MW-10	14	1	0.0618	0.0618	NA	0.062
MW-34-55	9	1	0.0404	0.0404	NA	0.040
MW-9	1	1	0.0059	0.0059	NA	0.0059
OW-2D	14	1	0.0085	0.0085	NA	0.0085
OW-5M	14	1	0.02	0.02	NA	0.020
OW-5S	14	1	0.0649	0.0649	NA	0.065
TW-1	4	2	0.0122	0.0873	NA	0.087
Thallium						
CW-3D	7	1	0.0012	0.0012	NA	0.0012
MW-12	17	1	0.00111	0.00111	NA	0.0011
Vanadium						
CW-1D	7	6	0.00416	0.0893	NA	0.089
CW-1M	7	6	0.00357	0.0977	NA	0.098
CW-2D	7	6	0.00545	0.121	NA	0.12
CW-2M	7	6	0.00417	0.124	NA	0.12
CW-3D	7	6	0.00219	0.115	NA	0.12

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
CW-3M	7	6	0.00224	0.0983	NA	0.098
CW-4D	7	6	0.00284	0.109	NA	0.11
CW-4M	7	6	0.0034	0.0953	NA	0.095
MW-10	17	17	0.02	0.165	Y	0.059
MW-12	20	20	0.009	0.218	Y	0.082
MW-20-130	15	11	0.0028	0.172	Y	0.10
MW-20-70	16	15	0.0034	0.117	Y	0.058
MW-22	6	2	0.044	0.179	NA	0.18
MW-30-30	4	1	0.2	0.2	NA	0.20
MW-31-60	5	4	0.0058	0.118	NA	0.12
MW-34-55	9	5	0.00115	0.227	Y	0.29
OW-1D	15	14	0.00169	0.122	Y	0.075
OW-5D	14	11	0.00166	0.0966	Y	0.072
OW-5M	14	12	0.00181	0.122	Y	0.061
Zinc						
CW-1D	8	4	0.0185	0.113	NA	0.11
CW-1M	8	3	0.019	0.248	NA	0.25
CW-2M	8	3	0.0272	0.215	NA	0.22
MW-10	39	28	0.0053	0.637	Y	0.18
MW-11	35	26	0.0053	0.45	Y	0.18
MW-13	27	23	0.0068	0.451	Y	0.22
MW-14	26	24	0.008	0.498	Y	0.18
MW-15	24	21	0.004	0.419	Y	0.19
MW-19	22	19	0.011	0.398	Y	0.22
MW-20-100	23	21	0.0065	0.486	Y	0.19
MW-20-130	34	27	0.0102	0.445	Y	0.11
MW-20-70	36	28	0.0112	0.53	Y	0.20
MW-21	25	20	0.0053	0.692	Y	0.33
MW-22	27	22	0.0068	0.734	Y	0.20
MW-23	26	22	0.0066	0.817	Y	0.27
MW-24A	25	21	0.0056	0.62	Y	0.21
MW-24B	23	20	0.0096	0.468	Y	0.23
MW-24BR	22	19	0.009	0.152	Y	0.079
MW-25	29	23	0.0073	0.555	Y	0.17
MW-26	25	23	0.0088	0.514	Y	0.21
MW-27-20	22	18	0.0053	0.44	Y	0.18

Table 4-2. Estimated EPCs of Well-Specific COPCs in Groundwater

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-28-25	21	19	0.0053	0.286	Y	0.15
MW-29	22	21	0.0049	0.356	Y	0.17
MW-30-30	22	18	0.008	0.597	Y	0.18
MW-30-50	6	5	0.0467	0.365	NA	0.37
MW-31-60	23	21	0.0073	0.274	Y	0.15
MW-32-20	6	5	0.0359	0.0857	NA	0.086
MW-32-35	9	5	0.0398	0.381	Y	0.32
MW-33-40	6	4	0.0331	0.171	NA	0.17
MW-33-90	6	5	0.017	0.315	NA	0.32
MW-9	27	26	0.0034	0.363	Y	0.21
Park Moabi-4	1	1	0.605	0.605	NA	0.61
PGE-6	17	16	0.0067	1.5	Y	0.67
PGE-7	15	15	0.01	0.125	Y	0.052
PGE-8	17	17	0.015	0.82	Y	0.31
TW-1	4	4	0.0386	0.11	NA	0.11
TW-2S	3	2	0.05	0.217	NA	0.22

Notes:

(1) Data shown here fit one of two criteria:

(a) For data with eight or more samples and five or more detections, statistical hypothesis tests conducted are presented in Table 4-1a to confirm concentration in the well is greater than background. For these wells, the 95% UCL of the mean calculated using ProUCL is used as the EPC.

(b) For data with fewer samples or detections, the maximum detected chemical concentration at individual wells exceed the UTL. For these wells the maximum detected concentration is used as the EPC.

(2) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

COPC = constituent of potential concern
EPC = exposure point concentration
mg/L = milligram(s) per liter
NA = not applicable – data do not meet minimum criteria to perform statistical tests
UCL = upper confidence limit
UTL = upper tolerance limit
Y = Statistical tests conclude site concentration is greater than background concentration.

Table 4-3. Site-Wide Statistical Summary of Floodplain ICOPCs in Site Groundwater – Comparison to Background

Chemical of Potential Concern	Number of Detections	Number of Samples	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	Maximum Detection Above UTL?	Quantile Test Conclusion	Median Test Conclusion	Include as COPC?
Aluminum	21	294	0.0535	0.749	0.0558	Y	Inconclusive	Site ≤ Background	Y
Ammonia as nitrogen	120	569	0.062	180	NA	NA	Site > Background	Site > Background	Y
Antimony	9	384	0.0033	0.155	0.00122	Y	Inconclusive	Site > Background	Y
Arsenic	190	460	0.00105	0.157	0.0243	Y	Site > Background	Site ≤ Background	Y
Barium	361	559	0.00917	5.3	0.195	Y	Inconclusive	Site ≤ Background	Y
Beryllium	20	374	0.0011	0.0088	0.000663	Y	Inconclusive	Site > Background	Y
Cadmium	1	374	0.0105	0.0105	NA	NA	NA	NA	Y
Chloride	825	825	18.9	22,300	NA	NA	Site > Background	Site > Background	Y
Chromium, hexavalent	1,650	2,780	0.00024	15.7	0.0318	Y	Site > Background	Site > Background	Y
Cobalt	13	374	0.00101	0.01	0.000843	Y	Inconclusive	Site > Background	Y
Copper	358	1,049	0.00103	0.306	0.0105	Y	Inconclusive	Site > Background	Y
Fluoride	426	491	0.05	24.6	7.12	Y	Inconclusive	Site > Background	Y
Iron	152	684	0.0245	21	NA	NA	Site > Background	Site > Background	Y
Lead	62	474	0.00083	0.076	0.00191	Y	Inconclusive	Site > Background	Y
Mercury	1	380	0.0004	0.0004	NA	NA	NA	NA	Y
Molybdenum	528	563	0.00085	0.301	0.0363	Y	Site > Background	Site > Background	Y
Nickel	479	1,049	0.00069	0.5	0.0106	Y	Inconclusive	Site > Background	Y
Nitrate as nitrogen	573	844	0.107	31.8	5.03	Y	Inconclusive	Site ≤ Background	Y
Selenium	168	396	0.00103	0.155	0.0103	Y	Inconclusive	Site > Background	Y
Silver	8	374	0.0059	0.0873	0.00213	Y	Inconclusive	Site ≤ Background	Y
Thallium	2	374	0.00111	0.0012	0.000908	Y	Inconclusive	Site ≤ Background	Y
Vanadium	372	462	0.00096	0.326	0.0599	Y	Site > Background	Site ≤ Background	Y
Zinc	725	1,049	0.0033	1.5	0.0777	Y	Site > Background	Site > Background	Y

Table 4-3. Site-Wide Statistical Summary of Floodplain ICOPCs in Site Groundwater – Comparison to Background

Chemical of Potential Concern	Number of Detections	Number of Samples	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background UTL (mg/L)	Maximum Detection Above UTL?	Quantile Test Conclusion	Median Test Conclusion	Include as COPC?

Notes:

(1) Cadmium and mercury can not be statistically evaluated because the background data are all nondetectable results.

(2) Median tests are conducted using either the Gehan or Mann-Whitney Test, depending on the frequency of nondetect results and the presence of multiple detection limits. The Mann-Whitney Test is used when the frequency of nondetects is 40% or less and a single detection limit is present, vice versa, the Gehan Test is used when the frequency is greater than 40% or multiple detection limits are present. All median tests performed are Gehan Tests, because multiple detection limits are present.

(3) A chemical is determined to be a COPC if either statistical test indicates that site data are greater than background.

(4) UTLs obtained from Table 3-1, CH2M HILL (2008).

(a) Cadmium and mercury were not detected in background wells; therefore, UTLs were not calculated in CH2M HILL (2008).

(b) UTLs were not calculated in CH2M HILL (2008) for ammonia as nitrogen, chloride, and iron.

(c) UTLs were not calculated in CH2M HILL (2008) for nitrate as nitrogen or fluoride. UTLs for these compounds were presented in the RFI/RI Volume 2 (CH2M HILL, 2009).

(5) Ammonia and ammonia as nitrogen are combined in this analysis.

(6) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

(7) Inconclusive Quantile Test results occur when detection limits are high and there are too many nondetects in the upper tail of the distribution.

(8) In performing the above statistical analyses, an erroneous Mann-Whitney conclusion was discovered affecting samples with more than 20 samples in one of the two populations. As recommended by ProUCL developers, for these samples the Median Test conclusion is based on the p-value (personal communication, Narain Armbya).

COPC = constituent of potential concern
ICOPC = initial constituent of potential concern
NA = not applicable – data do not meet minimum criteria to perform statistical tests
mg/L = milligram(s) per liter

Source:

CH2M HILL. 2008. Revised Groundwater Background Study Steps 3 and 4: Final Report of Results, PG&E Topock Compressor Station, Needles, California. July.

CH2M HILL. 2009. Revised Final RCRA Facility Investigation/Remedial Investigation Report Volume 2. Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, PG&E Topock Compressor Station, Needles, California. January.

Table 4-4. Estimated EPCs of Floodplain COPCs in Floodplain Groundwater – Comparison to Surface Water Quality Criteria

Chemical of Potential Concern	Number of Samples	Number of Detections	95% UCL (mg/L)	Maximum Detection (mg/L)	Estimated EPC (mg/L)	Surface Water Screening Criteria (mg/L)	Type of Crit.	Ratio of EPC to Screening Criteria	Present Above Surface Water Criteria?
Aluminum	46	2	6.7E-02	1.4E-01	1.4E-01	1	HH	0.14	
Ammonia as nitrogen	226	78	1.4E+00	1.4E+01	1.4E+00	1.41	Eco	0.98	
Antimony	79	5	4.9E-02	1.6E-01	4.9E-02	0.006	HH	8.1	Y
Arsenic	134	66	4.9E-03	2.4E-02	4.9E-03	0.01	HH	0.49	
Barium	172	109	2.2E-01	5.3E+00	2.2E-01	0.004	Eco	55	Y
Beryllium	79	1	NA	1.1E-03	1.1E-03	0.00066	Eco	1.7	Y
Cadmium	79	0	NA	NA	NA	0.005	HH	NA	
Chloride	416	416	5.0E+03	2.2E+04	5.0E+03	230	Eco	22	Y
Chromium, hexavalent	1768	851	2.1E+00	8.8E+00	2.1E+00	0.011	Eco	190	Y
Cobalt	79	8	1.3E+00	1.6E+01	1.3E+00	0.023	Eco	59	Y
Copper	345	124	1.3E-03	5.0E-03	1.3E-03	0.023	Eco	0.057	
Fluoride	142	98	1.2E-02	3.1E-01	1.2E-02	2	HH	0.0059	
Iron	326	128	1.5E+00	2.1E+01	1.5E+00	1	Eco	1.5	Y
Lead	114	21	6.4E-03	7.6E-02	6.4E-03	0.008	Eco	0.80	
Mercury	82	1	NA	4.0E-04	4.0E-04	0.00005	HH	8.0	Y
Molybdenum	115	106	3.0E-02	2.0E-01	3.0E-02	0.37	Eco	0.081	
Nickel	345	160	1.7E-02	5.0E-01	1.7E-02	0.1	HH	0.17	
Nitrate as nitrogen	439	190	2.6E+00	2.5E+01	2.6E+00	10	HH	0.26	
Selenium	86	35	6.0E-03	2.3E-02	6.0E-03	0.005	Eco	1.2	Y
Silver	79	1	NA	4.0E-02	4.0E-02	0.00036	Eco	110	Y
Thallium	79	0	NA	NA	NA	0.0017	HH	NA	
Vanadium	115	77	3.7E-02	2.4E-01	3.7E-02	0.02	Eco	1.8	Y
Zinc	345	270	9.8E-02	8.2E-01	9.8E-02	0.3	Eco	0.33	

Table 4-4. Estimated EPCs of Floodplain COPCs in Floodplain Groundwater – Comparison to Surface Water Quality Criteria

Notes:

(1) The EPC is the 95% UCL of the mean, as calculated by ProUCL, if there are at least eight results including at least five detections; otherwise, the EPC is the maximum detected concentration.

(2) See Table 3-3 for floodplain well designation.

(3) Surface water screening criteria consist of the more stringent of human health (HH) or ecological (Eco) surface water criteria. See text.

(4) Ammonia and ammonia as nitrogen are combined in this analysis.

(5) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

(6) Chemicals with EPCs exceeding the screening criteria are further analyzed as surface water COPCs in Table 4-5.

COPC = constituent of potential concern
Eco = ecological
EPC = exposure point concentration
HH = human health
NA = not applicable – data do not meet minimum criteria to perform statistical tests
mg/L = milligram(s) per liter
UCL = upper confidence limit
UTL = upper tolerance limit

Source:

CH2M HILL. 2008. Revised Groundwater Background Study Steps 3 and 4: Final Report of Results, PG&E Topock Compressor Station, Needles, California. July.

Table 4-5. Estimated EPCs of Floodplain COPCs in Downstream Surface Water – Comparison to Surface Water Quality Criteria

Chemical of Potential Concern	Number of Samples	Number of Detects	UCL (mg/L)	Mean Concentration (mg/L)	Maximum Concentration (mg/L)	Data Source	Estimated EPC (mg/L)	Screening Criteria (mg/L)	Type of Crit.	Ratio of EPC to Screening Criteria	Present Above Surface Water Criteria?
Antimony	30	ND	ND	0.001	ND	2	ND	0.006	HH	ND	
Barium	9	6	0.14	0.17	0.17	1	0.14	0.004	Eco	35	Y
Beryllium	30	ND	ND	0.00025	ND	2	ND	0.00066	Eco	ND	
Chloride	39	39	90.3	88.5	106	1	90.3	230	Eco	0.39	
Chromium, hexavalent	547	1	NA	0.0011	0.0004	1	0.0004	0.011	Eco	0.036	
Cobalt	NS	NS	NS	NS	NS		NS	0.023	Eco	NS	
Iron	8	ND	ND	0.25	ND	1	ND	1	Eco	ND	
Mercury	NS	NS	NS	NS	NS		NS	0.00005	HH	NS	
Selenium	30	ND	ND	0.0025	ND	2	ND	0.005	Eco	ND	
Silver	30	ND	ND	0.0025	ND	2	ND	0.00036	Eco	ND	
Vanadium	6	3	0.509	0.045	0.253	1	0.253	0.02	Eco	13	Y

Table 4-5. Estimated EPCs of Floodplain COPCs in Downstream Surface Water – Comparison to Surface Water Quality Criteria

Notes:

(1) Non-detects are assumed equal to one-half the reporting limit in calculating mean concentrations.

(2) High reporting limits can lead to a calculated mean concentration higher than the maximum detected concentration.

(3) See Table 3-5 for upstream/downstream location designation.

(4) Surface water screening criteria consist of the more stringent of human health (HH) or ecological (Eco) surface water criteria.

(5) Nitrate as NO_3^- and nitrate as nitrogen are combined in this analysis.

(6) The EPC is the 95% UCL of the mean, as calculated by ProUCL, if there are at least eight results including at least five detections; otherwise, the EPC is the maximum detected concentration.

(7) EPCs are presented for chemicals detected in floodplain groundwater wells in concentrations exceeding surface water screening criteria (see Table 4-4).

COPC = constituent of potential concern
Eco = ecological
EPC = exposure point concentration
HH = human health
mg/L = milligram(s) per liter
NA = not applicable – data do not meet minimum criteria to perform statistical tests
ND = not detected
NS = not sampled
UCL = upper confidence limit

Sources:

(1) CH2M HILL. 2009. Revised Final RCRA Facility Investigation/Remedial Investigation Report Volume 2. Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, PG&E Topock Compressor Station, Needles, California. January.

(2) Metropolitan Water District of Southern California (see Appendix C).

Table 4-6. Statistical Summary of Floodplain COPCs in Surface Water – Downstream vs. Upstream Population Comparison

	PG&E Topock Surface Water Data		Metropolitan Surface Water Data		
Chemical of Potential Concern	Quantile Conclusion	Mann-Whitney Conclusion	Quantile Conclusion	Mann-Whitney Conclusion	Conclude Downstream > Upstream?
Barium	Not enough samples	Not enough samples	Downstream ≤ Upstream	Downstream ≤ Upstream	N
Vanadium	Not enough samples	Not enough samples	Downstream ≤ Upstream	Downstream ≤ Upstream	N

Notes:

(1) Comparison of downstream surface water data to upstream (background) data using ProUCL for chemicals with EPCs exceeding screening levels in Table 4-5.

(2) See Table 3-5 for upstream/downstream location designation.

(3) A minimum of eight samples and five detection in both upstream and downstream datasets is necessary for statistical analysis.

COPC = constituent of potential concern

Table 5-1. Standard Default Exposure Assumptions: Hypothetical Future Groundwater User

Parameter	Symbol	Value			Units
		On-Site Resident Child	On-Site Resident Adult	On-Site Resident Age-Adjusted	
Dermal Contact with Groundwater					
Surface area	SA	6,600	18,000	18,000	cm^2
Conversion factor	CF	0.001	0.001	0.001	L/cm^3
Ingestion of Groundwater					
Ingestion rate	IR	1	2	2	L/d
Population-Specific Intake Parameters					
Exposure time	ET	1	0.58	0.58	hr/d
Exposure frequency	EF	350	350	350	d/yr
Exposure duration	ED	6	30	24	yr
Body weight	BW	15	70	70	kg
Averaging time for carcinogenic effects	AT_c	25,550	25,550	25,550	d
Averaging time for noncarcinogenic effe	AT_{nc}	2,190	10,950	NA	d

Notes:

(1) Per CalEPA guidance (1994), cancer risks for the hypothetical future groundwater user are calculated using an age-adjusted approach to account for the higher exposures per body weight that occur during the childhood years. Accordingly, for carcinogenic effects, the evaluation assumes that the hypothetical groundwater user is a child for the first 6 years of exposure and an adult for the remaining 24 years. For noncarcinogenic hazards, the averaging time for the adult resident is 30 years.

cm^2 = square centimeter(s)
d = day(s)
d/yr = day(s) per year
hr/d = hour(s) per day
kg = kilogram(s)
L/cm^3 = liter(s) per cubic centimeter
L/d = liter(s) per day
yr = year

Sources:

CalEPA. 1994. Preliminary Endangerment Assessment Guidance Manual. California Environmental Protection Agency, Department of Toxic Substances Control. January.

CalEPA. 2005. Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Military Facilities. Human Health Risk Assessment (HHRA) Note Number: 1. Department of Toxic Substances Control (DTSC). Human and Ecological Risk Division (HERD). October 27.

USEPA. 2004. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). Final. Office of Superfund Remediation and Technology Innovation. July.

Table 5-2. Physicochemical Properties

Chemical of Potential Concern	K_p (cm/hr)
Aluminum	0.001
Antimony	0.001
Arsenic	0.001
Barium	0.001
Beryllium	0.001
Cadmium	0.001
Chromium, hexavalent	0.002
Cobalt	0.001
Copper	0.001
Fluoride	0.001
Mercury	0.001
Molybdenum	0.001
Nickel	0.0002
Nitrate as nitrogen	0.001
Selenium	0.001
Silver	0.0006
Thallium	0.001
Vanadium	0.001
Zinc	0.0006

Notes:

(1) K_p is the chemical-specific dermal permeability coefficient for specific compound classes from CalEPA (1994).

(2) The default K_p value for inorganic compounds is 0.001 cm/hr from RAGS Part E (USEPA, 2001).

cm/h = centimeter(s) per hour

Sources:

CalEPA. 1994. *Preliminary Endangerment Assessment Guidance Manual*. California Environmental Protection Agency, Department of Toxic Substances Control. January.

USEPA. 2001. *Risk Assessment Guidance for Superfund, Part E, Supplemental Guidance for Dermal Risk Assessment.* U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response., Washington, DC. September.

Table 5-3. CDI Equations

Dermal Contact

Noncancer

$$CDI_{derm,child} = \frac{C_w \times SA_{child} \times PC \times ET_{child} \times EF \times ED_{child} \times CF}{BW_{child} \times AT_{nc,child}}$$

$$CDI_{derm,adult} = \frac{C_w \times SA_{adult} \times PC \times ET_{adult} \times EF \times ED_{adult} \times CF}{BW_{adult} \times AT_{nc,adult}}$$

Cancer

$$CDI_{derm,age-adjusted} = \frac{C_w \times SA_{child} \times PC \times ET_{child} \times EF \times ED_{child} \times CF}{BW_{child} \times AT_c} + \frac{C_w \times SA_{adult} \times PC \times ET_{adult} \times EF \times ED_{age-adjusted} \times CF}{BW_{adult} \times AT_c}$$

Ingestion

Noncancer

$$CDI_{ing,child} = \frac{C_w \times IR_{child} \times EF \times ED_{child}}{BW_{child} \times AT_{nc,child}}$$

$$CDI_{ing,adult} = \frac{C_w \times IR_{adult} \times EF \times ED_{adult}}{BW_{adult} \times AT_{nc,adult}}$$

Cancer

$$CDI_{ing,age-adjusted} = \frac{C_w \times IR_{child} \times EF \times ED_{child}}{BW_{child} \times AT_c} + \frac{C_w \times IR_{adult} \times EF \times ED_{age-adjusted}}{BW_{adult} \times AT_c}$$

Notes:

(1) Definitions and values of symbols used are given in Table 5-1.

(2) PC is a chemical-specific permeability constant (K_p) given in Table 5-2.

CDI = chronic daily intake

Table 6-1. Carcinogenic and Noncarcinogenic Toxicity Values

	Oral Slope Factor (SF_o) (per mg/kg/d)		Oral Chronic Reference Dose (RfD_o) (mg/kg/d)	
Chemical of Potential Concern	Value	Source	Value	Source
Aluminum	NC	NA	1.0E+00	3P
Antimony	NC	NA	4.0E-04	2
Arsenic	9.45E+00	1	3.0E-04	2
Barium	NC	NA	2.0E-01	2
Beryllium	NC	NA	2.0E-03	2
Cadmium	NC	NA	5.0E-04	2
Chromium, hexavalent	NC	NA	3.0E-03	2
Cobalt	NC	NA	3.0E-04	3P
Copper	NC	NA	4.0E-02	3H
Fluoride	NC	NA	6.0E-02	2
Mercury	NC	NA	3.0E-04	3I
Molybdenum	NC	NA	5.0E-03	2
Nickel	NC	NA	2.0E-02	2
Nitrate as nitrogen	NC	NA	1.6E+00	2
Selenium	NC	NA	5.0E-03	2
Silver	NC	NA	5.0E-03	2
Thallium	NC	NA	6.5E-05	3S
Vanadium	NC	NA	7.0E-03	3H
Zinc	NC	NA	3.0E-01	2

Notes:

P = PPRTV
H = HEAST
I = IRIS
mg/kg/d = milligrams per kilogram per day
N = NCEA
NA = not applicable
NC = not considered to be a carcinogen.
S = see user guide Section 5, USEPA 2008 (RSL table)

Sources:

(1) CalEPA. 2008. *Toxicity Criteria Database*. Office of Environmental Health Hazard Assessment (OEHHA). URL: http://www.oehha.org/risk/ChemicalDB/index.asp. Accessed on September 16th, 2008.

(2) USEPA. 2008. Integrated Risk Information System (IRIS). URL: http://www.epa.gov/iriswebp/iris/. Accessed on September 16th, 2008.

(3) USEPA. 2008. Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites. URL: http://www.epa.gov/region09/waste/sfund/prg/. September 12.

(4) USEPA. 1997. *Health Effects Assessment Summary Tables (HEAST) FY 1997 Update.* Office of Solid Waste and Emergency Response. EPA 540-R-97-036. July.

**Table 7-1. Summary of Estimated Potential Cancer Risk:
Future Hypothetical Groundwater User – Well-Specific**

	On-Site Resident Age-Adjusted
Well ID	Arsenic
MW-12	1.5E-02
MW-24A	4.7E-03
MW-43-25	3.4E-03

Notes:
(1) Complete risks showing all pathways and receptors is presented in Appendix O.

Table 7-2. Summary of Estimated Potential Noncancer Hazard Indices: Future Hypothetical Child Groundwater User – Well-Specific

Well ID	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc	Cumulative Estimated Noncancer Hazard Index
MW-1	4.4E-03	ND	ND	ND	ND	ND	ND	ND	ND	8.5E+00	ND	1.0E+00	7.4E-02	2.5E-01	ND	ND	ND	ND	ND	9.9E+00
MW-3	4.1E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.4E-01	1.3E-01	4.4E-01	ND	ND	ND	ND	ND	1.0E+00
MW-4	4.0E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.0E-02	2.5E-01	ND	ND	ND	ND	ND	3.3E-01
MW-5	3.8E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2E+00	6.4E-02	7.6E-01	2.6E-01	ND	ND	ND	ND	2.3E+00
MW-6	4.0E-03	ND	ND	ND	ND	ND	ND	ND	ND	9.2E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.2E+00
MW-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.4E-02	3.1E-01	ND	ND	ND	ND	ND	3.8E-01
MW-8	ND	ND	ND	ND	ND	ND	1.1E+00	ND	1.8E-02	ND	ND	ND	5.1E-02	8.2E-01	ND	ND	ND	ND	ND	2.0E+00
MW-9	ND	ND	ND	ND	ND	ND	7.5E+00	ND	1.2E-02	ND	ND	ND	2.6E-02	9.1E-01	1.7E-01	7.6E-02	ND	ND	4.4E-02	8.7E+00
MW-10	4.2E-03	5.3E-01	ND	ND	ND	ND	4.4E+01	ND	7.9E-03	2.6E+01	ND	2.1E+00	2.1E-02	6.5E-01	9.7E-02	7.9E-01	ND	5.4E-01	3.9E-02	7.5E+01
MW-11	ND	ND	ND	3.0E-02	ND	ND	1.9E+01	ND	7.8E-03	ND	ND	ND	2.2E-02	4.2E-01	1.0E-01	ND	ND	ND	3.8E-02	1.9E+01
MW-12	4.4E-03	3.4E+00	2.3E+01	ND	ND	ND	2.9E+01	ND	7.9E-03	ND	ND	7.0E-01	2.0E-02	ND	ND	ND	1.1E+00	7.5E-01	ND	5.8E+01
MW-13	ND	ND	ND	ND	ND	ND	ND	ND	1.0E-02	ND	ND	ND	8.6E-02	ND	ND	ND	ND	ND	4.6E-02	1.4E-01
MW-14	ND	ND	ND	ND	ND	ND	9.4E-01	2.2E-01	1.3E-02	ND	ND	ND	4.3E-02	2.9E-01	ND	ND	ND	ND	3.8E-02	1.5E+00
MW-15	NS	NS	ND	ND	NS	NS	3.5E-01	NS	1.5E-02	ND	NS	ND	2.5E-02	3.9E-01	ND	NS	NS	ND	4.1E-02	8.2E-01
MW-19	ND	ND	ND	ND	ND	ND	1.9E+01	ND	1.1E-02	ND	ND	ND	2.4E-02	ND	ND	ND	ND	ND	4.7E-02	2.0E+01
MW-20-70	ND	1.4E+00	ND	ND	ND	ND	2.1E+02	ND	1.7E-02	ND	ND	ND	2.2E-02	5.0E-01	1.5E-01	ND	ND	5.3E-01	4.2E-02	2.1E+02
MW-20-100	NS	6.9E+00	ND	ND	ND	ND	1.6E+02	ND	1.9E-02	ND	ND	ND	7.3E-02	5.7E-01	ND	ND	ND	ND	4.1E-02	1.7E+02
MW-20-130	ND	ND	ND	ND	ND	ND	1.8E+02	2.3E-01	1.9E-02	ND	ND	6.2E-01	1.0E-01	4.6E-01	2.0E-01	ND	ND	9.3E-01	2.3E-02	1.9E+02
MW-21	ND	ND	ND	ND	ND	ND	ND	ND	4.3E-02	ND	ND	6.7E-01	1.6E-01	ND	4.9E-01	ND	ND	ND	7.0E-02	1.4E+00
MW-22	NS	ND	ND	1.6E-01	ND	ND	ND	1.1E+00	1.3E-01	ND	8.6E-02	7.2E-01	4.8E-01	2.7E-01	ND	ND	ND	1.6E+00	4.2E-02	4.6E+00
MW-23	NS	ND	ND	1.7E+00	ND	ND	ND	ND	3.0E-02	ND	ND	ND	2.6E-01	ND	1.4E-01	ND	ND	ND	5.7E-02	2.2E+00
MW-24A	NS	ND	7.2E+00	3.0E-01	ND	ND	7.3E+01	ND	2.3E-02	ND	ND	5.1E-01	2.1E-02	7.4E-01	6.5E-01	ND	ND	ND	4.5E-02	8.2E+01
MW-24B	ND	ND	ND	ND	ND	ND	1.1E+02	ND	1.0E-02	ND	ND	8.4E-01	4.0E-02	5.6E-01	1.8E-01	ND	ND	ND	5.0E-02	1.1E+02
MW-24BR	NS	NS	NS	9.7E-02	NS	NS	7.5E+00	NS	2.5E-02	ND	NS	7.5E-01	2.4E-02	ND	NS	NS	NS	ND	1.7E-02	8.4E+00
MW-25	ND	ND	ND	ND	ND	ND	5.1E+01	ND	1.2E-02	ND	ND	ND	1.8E-02	ND	7.3E-02	ND	ND	ND	3.6E-02	5.1E+01
MW-26	NS	ND	ND	ND	ND	ND	8.1E+01	ND	1.5E-02	ND	ND	5.5E-01	3.2E-02	2.2E-01	2.2E-01	ND	ND	ND	4.5E-02	8.2E+01
MW-27-20	ND	NS	NS	8.4E-02	NS	NS	ND	NS	3.0E-02	ND	NS	ND	1.5E-01	ND	NS	NS	NS	ND	3.8E-02	3.0E-01
MW-28-25	ND	NS	NS	7.7E-02	NS	NS	ND	NS	1.4E-02	ND	NS	ND	2.9E-02	ND	NS	NS	NS	ND	3.3E-02	1.5E-01
MW-29	NS	NS	NS	9.7E-02	NS	NS	ND	NS	1.6E-02	ND	NS	ND	3.3E-02	ND	NS	NS	NS	ND	3.6E-02	1.8E-01
MW-30-30	ND	ND	ND	3.5E-01	ND	ND	ND	ND	5.6E-02	ND	ND	1.3E+00	8.4E-01	5.8E-01	ND	ND	ND	1.8E+00	3.8E-02	5.0E+00
MW-30-50	NS	NS	NS	ND	NS	NS	2.9E+01	NS	6.3E-02	ND	NS	NS	ND	ND	NS	NS	NS	NS	7.8E-02	2.9E+01
MW-31-60	ND	ND	ND	ND	ND	ND	8.4E+01	ND	2.4E-02	ND	ND	ND	1.4E-01	2.0E-01	ND	ND	ND	1.1E+00	3.2E-02	8.5E+01
MW-31-135	NS	NS	ND	ND	NS	NS	6.1E+00	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	ND	6.1E+00
MW-32-20	ND	NS	NS	1.7E+00	NS	NS	ND	NS	ND	ND	NS	NS	ND	ND	NS	NS	NS	NS	1.8E-02	1.7E+00
MW-32-35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	ND	6.8E-02	6.8E-02
MW-33-40	ND	NS	NS	ND	NS	NS	ND	NS	3.0E-02	9.4E+00	NS	NS	ND	ND	NS	NS	NS	NS	3.7E-02	9.5E+00
MW-33-90	ND	ND	ND	ND	ND	ND	ND	ND	4.9E-01	ND	ND	4.7E-01	ND	ND	ND	ND	ND	ND	6.7E-02	1.0E+00
MW-33-210	ND	ND	ND	ND	ND	ND	ND	2.7E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.7E-01
MW-34-55	ND	4.2E+00	ND	ND	ND	ND	ND	ND	1.9E-02	ND	ND	ND	3.4E-02	NS	1.6E-01	5.2E-01	ND	2.7E+00	ND	7.6E+00
MW-34-80	3.9E-03	ND	ND	ND	ND	ND	ND	2.8E-01	1.7E-02	ND	ND	ND	2.6E-02	NS	ND	ND	ND	ND	ND	3.3E-01
MW-34-100	ND	ND	ND	ND	ND	ND	1.5E+01	ND	ND	ND	ND	4.7E-01	ND	ND	ND	ND	ND	ND	ND	1.6E+01
MW-35-60	ND	ND	ND	ND	ND	ND	8.0E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.0E-01
MW-35-135	ND	ND	ND	ND	ND	ND	5.7E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7E-01
MW-36-90	NS	NS	NS	ND	NS	NS	5.5E+01	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS	5.5E+01
MW-36-100	NS	NS	NS	ND	NS	NS	3.3E+01	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS	3.3E+01
MW-37D	ND	ND	ND	ND	ND	ND	3.4E+01	2.5E-01	ND	ND	ND	6.1E-01	8.1E-02	ND	ND	ND	ND	ND	ND	3.5E+01
MW-38S	ND	ND	ND	ND	ND	ND	1.9E+01	ND	ND	ND	ND	8.2E-01	ND	4.2E-01	ND	ND	ND	ND	ND	2.0E+01

Table 7-2. Summary of Estimated Potential Noncancer Hazard Indices: Future Hypothetical Child Groundwater User – Well-Specific

Well ID	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc	Cumulative Estimated Noncancer Hazard Index
MW-38D	NS	NS	ND	ND	NS	NS	4.7E+00	NS	ND	ND	NS	1.0E+00	ND	5.9E-01	ND	NS	NS	ND	ND	6.3E+00
MW-39-50	NS	NS	NS	ND	NS	NS	3.6E+01	NS	NS	ND	NS	NS	NS	2.5E-01	NS	NS	NS	NS	NS	3.7E+01
MW-39-60	ND	ND	ND	ND	ND	ND	6.3E+01	ND	ND	ND	ND	ND	ND	2.5E-01	ND	ND	ND	ND	ND	6.3E+01
MW-39-70	NS	NS	NS	ND	NS	NS	9.3E+01	NS	NS	ND	NS	NS	NS	3.6E-01	NS	NS	NS	NS	NS	9.3E+01
MW-39-80	NS	NS	NS	ND	NS	NS	9.5E+01	NS	NS	ND	NS	NS	NS	3.6E-01	NS	NS	NS	NS	NS	9.5E+01
MW-39-100	NS	NS	NS	ND	NS	NS	1.7E+02	NS	NS	ND	NS	NS	NS	3.9E-01	NS	NS	NS	NS	NS	1.7E+02
MW-40S	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.7E-01	ND	ND	ND	ND	ND	2.7E-01
MW-40D	NS	NS	ND	ND	NS	NS	1.8E+00	NS	ND	ND	NS	5.9E-01	ND	7.9E-01	ND	NS	NS	ND	ND	3.2E+00
MW-43-25	ND	ND	5.2E+00	ND	3.5E-02	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	ND	ND	5.3E+00
MW-44-115	NS	ND	ND	ND	ND	ND	2.9E+01	ND	ND	NS	ND	1.1E+00	ND	ND	ND	ND	ND	ND	ND	3.0E+01
MW-44-125	NS	NS	ND	ND	NS	NS	8.2E+00	NS	ND	ND	NS	1.6E+00	ND	2.6E-01	ND	NS	NS	ND	ND	1.0E+01
MW-45-095a	NS	NS	ND	ND	NS	NS	5.6E+00	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	ND	5.6E+00
MW-46-175	NS	NS	ND	ND	NS	NS	3.8E+00	NS	ND	ND	NS	2.5E+00	ND	ND	ND	NS	NS	ND	ND	6.3E+00
MW-47-55	NS	NS	ND	ND	NS	NS	1.2E+00	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	ND	1.2E+00
MW-50-095	NS	NS	NS	NS	NS	NS	5.9E+00	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	5.9E+00
MW-50-200	NS	ND	ND	ND	ND	ND	2.4E+02	ND	ND	NS	ND	6.9E-01	ND	2.4E-01	ND	ND	ND	ND	ND	2.4E+02
MW-51	NS	ND	ND	ND	ND	ND	1.0E+02	ND	ND	NS	ND	5.1E-01	ND	5.7E-01	2.3E-01	ND	ND	ND	ND	1.0E+02
OW-1S	7.6E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.6E-03
OW-1M	7.1E-03	ND	ND	ND	8.0E-02	ND	ND	ND	3.4E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2E-01
OW-1D	ND	ND	ND	ND	9.0E-02	ND	ND	ND	3.5E-02	ND	ND	4.2E-01	ND	ND	ND	ND	ND	6.9E-01	ND	1.2E+00
OW-2S	9.8E-03	ND	ND	ND	5.8E-02	ND	8.6E-01	ND	ND	ND	ND	6.1E-01	ND	2.0E-01	ND	ND	ND	ND	ND	1.7E+00
OW-2M	ND	ND	ND	ND	7.4E-02	ND	ND	ND	3.3E-02	ND	ND	ND	ND	1.4E-01	ND	ND	ND	ND	ND	2.5E-01
OW-2D	ND	ND	ND	ND	7.4E-02	ND	ND	ND	3.0E-02	ND	ND	5.3E-01	4.3E-02	1.9E-01	ND	1.1E-01	ND	ND	ND	9.8E-01
OW-3D	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.6E-01	ND	ND	ND	ND	ND	ND	ND	5.6E-01
OW-5S	6.4E-03	ND	ND	ND	ND	ND	5.8E-01	2.7E-01	2.4E-02	ND	ND	ND	ND	1.8E-01	ND	8.3E-01	ND	ND	ND	1.9E+00
OW-5M	4.8E-02	1.8E+00	ND	ND	2.8E-01	1.4E+00	ND	2.1E+00	ND	ND	ND	4.1E-01	6.4E-02	ND	2.4E-01	2.6E-01	ND	5.6E-01	ND	7.1E+00
OW-5D	1.3E-02	ND	ND	ND	8.0E-02	ND	ND	ND	2.4E-02	ND	ND	6.1E-01	ND	ND	ND	ND	ND	6.6E-01	ND	1.4E+00
PE-1	NS	NS	ND	ND	NS	NS	2.2E+00	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS	2.2E+00
PGE-6	NS	NS	NS	ND	NS	NS	2.6E+01	NS	2.3E-02	ND	NS	ND	2.0E-02	ND	NS	NS	NS	ND	1.4E-01	2.6E+01
PGE-7	NS	NS	NS	ND	NS	NS	1.2E+02	NS	3.1E-02	ND	NS	7.2E-01	2.5E-02	4.2E-01	NS	NS	NS	ND	1.1E-02	1.2E+02
PGE-8	NS	NS	NS	ND	NS	NS	ND	NS	ND	ND	NS	1.0E+00	4.3E-02	ND	NS	NS	NS	ND	6.6E-02	1.1E+00
Park Moabi-4	NS	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	1.0E+00	ND	ND	ND	ND	1.3E-01	1.2E+00
PT-1D	NS	NS	ND	NS	NS	NS	6.6E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	6.6E+01
PT-2D	NS	NS	ND	NS	NS	NS	5.0E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	5.0E+01
PT-3D	NS	NS	ND	NS	NS	NS	9.6E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	9.6E+01
PT-4D	NS	NS	ND	NS	NS	NS	1.3E+02	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	1.3E+02
PT-5D	NS	NS	ND	NS	NS	NS	1.3E+02	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	1.3E+02
PT-6D	NS	NS	ND	NS	NS	NS	7.1E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	7.1E+01
PT-7S	NS	NS	ND	NS	NS	NS	2.6E+01	NS	NS	NS	NS	NS	NS	8.8E-01	NS	NS	NS	NS	NS	2.7E+01
PT-7M	NS	NS	ND	NS	NS	NS	5.0E+01	NS	NS	NS	NS	NS	NS	1.0E+00	NS	NS	NS	NS	NS	5.1E+01
PT-7D	NS	NS	ND	NS	NS	NS	1.6E+02	NS	NS	NS	NS	NS	NS	3.0E-01	NS	NS	NS	NS	NS	1.6E+02
PT-8S	NS	NS	ND	NS	NS	NS	3.8E+01	NS	NS	NS	NS	NS	NS	1.0E+00	NS	NS	NS	NS	NS	3.9E+01
PT-8M	NS	NS	ND	NS	NS	NS	8.5E+01	NS	NS	NS	NS	NS	NS	1.3E+00	NS	NS	NS	NS	NS	8.7E+01
PT-8D	NS	NS	ND	NS	NS	NS	1.4E+02	NS	NS	NS	NS	NS	NS	3.9E-01	NS	NS	NS	NS	NS	1.4E+02
PT-9S	NS	NS	ND	NS	NS	NS	2.5E+01	NS	NS	NS	NS	NS	NS	6.6E-01	NS	NS	NS	NS	NS	2.6E+01
PT-9M	NS	NS	ND	NS	NS	NS	5.1E+01	NS	NS	NS	NS	NS	NS	9.9E-01	NS	NS	NS	NS	NS	5.2E+01
PT-9D	NS	NS	ND	NS	NS	NS	3.4E+02	NS	NS	NS	NS	NS	NS	3.7E-01	NS	NS	NS	NS	NS	3.4E+02

Table 7-2. Summary of Estimated Potential Noncancer Hazard Indices: Future Hypothetical Child Groundwater User – Well-Specific

Well ID	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc	Cumulative Estimated Noncancer Hazard Index
PTI-1D	NS	NS	ND	NS	NS	NS	7.2E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	7.2E+01
PTR-1	NS	NS	ND	NS	NS	NS	1.2E+01	NS	NS	NS	NS	NS	NS	7.4E-01	NS	NS	NS	NS	NS	1.2E+01
PTR-2	NS	NS	ND	NS	NS	NS	6.9E+01	NS	NS	NS	NS	NS	NS	1.0E+00	NS	NS	NS	NS	NS	7.0E+01
TW-1	ND	ND	ND	ND	ND	ND	1.0E+02	ND	ND	NS	ND	ND	ND	2.2E-01	2.0E+00	1.1E+00	ND	ND	2.4E-02	1.0E+02
TW-2S	9.1E-03	2.5E+01	ND	ND	ND	ND	1.1E+02	ND	ND	ND	ND	ND	ND	2.7E-01	2.6E-01	ND	ND	ND	4.6E-02	1.3E+02
TW-2D	ND	2.5E+01	ND	ND	ND	ND	1.2E+02	ND	ND	ND	ND	6.4E-01	ND	ND	ND	ND	ND	ND	ND	1.4E+02
TW-3D	NS	NS	ND	NS	NS	NS	6.1E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	6.1E+01
TW-4	NS	NS	NS	NS	NS	NS	7.7E-01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	7.7E-01
CW-1M	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.0E-01	5.3E-02	9.5E-01
CW-1D	7.6E-03	ND	ND	ND	7.7E-02	ND	ND	ND	ND	ND	ND	5.2E-01	ND	ND	ND	ND	ND	8.2E-01	2.4E-02	1.4E+00
CW-2M	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1E+00	4.6E-02	1.2E+00
CW-2D	ND	ND	ND	ND	7.7E-02	ND	ND	ND	ND	4.7E+00	ND	7.9E-01	ND	ND	ND	ND	ND	1.1E+00	ND	6.7E+00
CW-3M	ND	ND	ND	ND	6.1E-02	ND	ND	ND	ND	ND	ND	3.8E-01	ND	1.7E-01	ND	ND	ND	9.0E-01	ND	1.5E+00
CW-3D	ND	ND	ND	ND	7.7E-02	ND	ND	ND	ND	ND	ND	8.4E-01	ND	ND	ND	ND	1.2E+00	1.1E+00	ND	3.2E+00
CW-4M	ND	ND	ND	ND	5.1E-02	ND	ND	ND	3.5E-02	ND	ND	ND	ND	ND	ND	ND	ND	8.8E-01	ND	9.6E-01
CW-4D	ND	ND	ND	ND	6.4E-02	ND	ND	ND	2.5E-02	ND	ND	5.4E-01	ND	ND	ND	ND	ND	1.0E+00	ND	1.6E+00

Notes:

(1) Hazard indices for all pathways and receptors are presented in Appendix O.

ND = not detected or not detected above background concentrations.

NS = not sampled

Table 7-3. Summary of Estimated Potential Noncancer Hazard Indices: Future Hypothetical Adult Groundwater User – Well-Specific

Well ID	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc	Cumulative Estimated Noncancer Hazard Index
MW-1	1.9E-03	ND	ND	ND	ND	ND	ND	ND	ND	3.6E+00	ND	4.3E-01	3.2E-02	1.1E-01	ND	ND	ND	ND	NS	4.2E+00
MW-3	1.8E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.9E-01	5.8E-02	1.9E-01	ND	ND	ND	ND	NS	4.4E-01
MW-4	1.7E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.0E-02	1.1E-01	ND	ND	ND	ND	NS	1.4E-01
MW-5	1.6E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.0E-01	2.7E-02	3.3E-01	1.1E-01	ND	ND	ND	NS	9.7E-01
MW-6	1.7E-03	ND	ND	ND	ND	ND	ND	ND	ND	3.9E+00	ND	ND	ND	ND	ND	ND	ND	ND	NS	3.9E+00
MW-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.7E-02	1.3E-01	ND	ND	ND	ND	NS	1.6E-01
MW-8	ND	ND	ND	ND	ND	ND	4.7E-01	ND	7.8E-03	ND	ND	ND	2.2E-02	3.5E-01	ND	ND	ND	ND	NS	8.5E-01
MW-9	ND	ND	ND	ND	ND	ND	3.2E+00	ND	5.1E-03	ND	ND	ND	1.1E-02	3.9E-01	7.3E-02	3.2E-02	ND	ND	1.9E-02	3.7E+00
MW-10	1.8E-03	2.3E-01	ND	ND	ND	ND	1.9E+01	ND	3.4E-03	1.1E+01	ND	9.2E-01	9.1E-03	2.8E-01	4.1E-02	3.4E-01	ND	2.3E-01	1.7E-02	3.2E+01
MW-11	ND	ND	ND	1.3E-02	ND	ND	7.9E+00	ND	3.3E-03	ND	ND	ND	9.5E-03	1.8E-01	4.5E-02	ND	ND	ND	1.6E-02	8.2E+00
MW-12	1.9E-03	1.4E+00	9.7E+00	ND	ND	ND	1.2E+01	ND	3.4E-03	ND	ND	3.0E-01	8.7E-03	ND	ND	ND	4.7E-01	3.2E-01	NS	2.5E+01
MW-13	ND	ND	ND	ND	ND	ND	ND	ND	4.5E-03	ND	ND	ND	3.7E-02	ND	ND	ND	ND	ND	2.0E-02	6.1E-02
MW-14	ND	ND	ND	ND	ND	ND	4.0E-01	9.3E-02	5.5E-03	ND	ND	ND	1.8E-02	1.3E-01	ND	ND	ND	ND	1.6E-02	6.6E-01
MW-15	NS	NS	ND	ND	NS	NS	1.5E-01	NS	6.4E-03	ND	NS	ND	1.1E-02	1.7E-01	ND	NS	NS	ND	1.7E-02	3.5E-01
MW-19	ND	ND	ND	ND	ND	ND	8.3E+00	ND	4.5E-03	ND	ND	ND	1.0E-02	ND	ND	ND	ND	ND	2.0E-02	8.3E+00
MW-20-70	ND	6.1E-01	ND	ND	ND	ND	8.9E+01	ND	7.4E-03	ND	ND	ND	9.6E-03	2.1E-01	6.5E-02	ND	ND	2.3E-01	1.8E-02	9.0E+01
MW-20-100	NS	3.0E+00	ND	ND	ND	ND	6.8E+01	ND	7.9E-03	ND	ND	ND	3.1E-02	2.4E-01	ND	ND	ND	ND	1.8E-02	7.2E+01
MW-20-130	ND	ND	ND	ND	ND	ND	7.9E+01	1.0E-01	8.1E-03	ND	ND	2.6E-01	4.5E-02	2.0E-01	8.7E-02	ND	ND	4.0E-01	9.9E-03	8.0E+01
MW-21	ND	ND	ND	ND	ND	ND	ND	ND	1.9E-02	ND	ND	2.9E-01	6.7E-02	ND	2.1E-01	ND	ND	ND	3.0E-02	6.1E-01
MW-22	NS	ND	ND	6.9E-02	ND	ND	ND	4.6E-01	5.4E-02	ND	3.7E-02	3.1E-01	2.1E-01	1.2E-01	ND	ND	ND	7.0E-01	1.8E-02	2.0E+00
MW-23	NS	ND	ND	7.3E-01	ND	ND	ND	ND	1.3E-02	ND	ND	ND	1.1E-01	ND	6.0E-02	ND	ND	ND	2.4E-02	9.4E-01
MW-24A	NS	ND	3.1E+00	1.3E-01	ND	ND	3.1E+01	ND	9.7E-03	ND	ND	2.2E-01	9.0E-03	3.1E-01	2.8E-01	ND	ND	ND	1.9E-02	3.5E+01
MW-24B	ND	ND	ND	ND	ND	ND	4.5E+01	ND	4.5E-03	ND	ND	3.6E-01	1.7E-02	2.4E-01	7.9E-02	ND	ND	ND	2.1E-02	4.6E+01
MW-24BR	NS	NS	NS	4.1E-02	NS	NS	3.2E+00	NS	1.1E-02	ND	NS	3.2E-01	1.0E-02	ND	NS	NS	NS	ND	7.2E-03	3.6E+00
MW-25	ND	ND	ND	ND	ND	ND	2.2E+01	ND	5.2E-03	ND	ND	ND	7.9E-03	ND	3.1E-02	ND	ND	ND	1.5E-02	2.2E+01
MW-26	NS	ND	ND	ND	ND	ND	3.4E+01	ND	6.5E-03	ND	ND	2.4E-01	1.4E-02	9.2E-02	9.3E-02	ND	ND	ND	1.9E-02	3.5E+01
MW-27-20	ND	NS	NS	3.6E-02	NS	NS	ND	NS	1.3E-02	ND	NS	ND	6.4E-02	ND	NS	NS	NS	ND	1.6E-02	1.3E-01
MW-28-25	ND	NS	NS	3.3E-02	NS	NS	ND	NS	6.0E-03	ND	NS	ND	1.2E-02	ND	NS	NS	NS	ND	1.4E-02	6.5E-02
MW-29	NS	NS	NS	4.1E-02	NS	NS	ND	NS	6.7E-03	ND	NS	ND	1.4E-02	ND	NS	NS	NS	ND	1.5E-02	7.7E-02
MW-30-30	ND	ND	ND	1.5E-01	ND	ND	ND	ND	2.4E-02	ND	ND	5.5E-01	3.6E-01	2.5E-01	ND	ND	ND	7.9E-01	1.6E-02	2.1E+00
MW-30-50	NS	NS	NS	ND	NS	NS	1.2E+01	NS	2.7E-02	ND	NS	NS	ND	ND	NS	NS	NS	NS	3.3E-02	1.2E+01
MW-31-60	ND	ND	ND	ND	ND	ND	3.6E+01	ND	1.0E-02	ND	ND	ND	6.0E-02	8.6E-02	ND	ND	ND	4.6E-01	1.4E-02	3.6E+01
MW-31-135	NS	NS	ND	ND	NS	NS	2.6E+00	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	NS	2.6E+00
MW-32-20	ND	NS	NS	7.1E-01	NS	NS	ND	NS	ND	ND	NS	NS	ND	ND	NS	NS	NS	NS	7.9E-03	7.2E-01
MW-32-35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	ND	2.9E-02	2.9E-02
MW-33-40	ND	NS	NS	ND	NS	NS	ND	NS	1.3E-02	4.0E+00	NS	NS	ND	ND	NS	NS	NS	NS	1.6E-02	4.1E+00
MW-33-90	ND	ND	ND	ND	ND	ND	ND	ND	2.1E-01	ND	ND	2.0E-01	ND	ND	ND	ND	ND	ND	2.9E-02	4.4E-01
MW-33-210	ND	ND	ND	ND	ND	ND	ND	1.2E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	1.2E-01
MW-34-55	ND	1.8E+00	ND	ND	ND	ND	ND	ND	8.3E-03	ND	ND	ND	1.5E-02	NS	6.9E-02	2.2E-01	ND	1.1E+00	NS	3.2E+00
MW-34-80	1.7E-03	ND	ND	ND	ND	ND	ND	1.2E-01	7.3E-03	ND	ND	ND	1.1E-02	NS	ND	ND	ND	ND	NS	1.4E-01
MW-34-100	ND	ND	ND	ND	ND	ND	6.6E+00	ND	ND	ND	ND	2.0E-01	ND	ND	ND	ND	ND	ND	NS	6.8E+00
MW-35-60	ND	ND	ND	ND	ND	ND	3.4E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	3.4E-01
MW-35-135	ND	ND	ND	ND	ND	ND	2.4E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	2.4E-01
MW-36-90	NS	NS	NS	ND	NS	NS	2.3E+01	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS	2.3E+01
MW-36-100	NS	NS	NS	ND	NS	NS	1.4E+01	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS	1.4E+01
MW-37D	ND	ND	ND	ND	ND	ND	1.5E+01	1.1E-01	ND	ND	ND	2.6E-01	3.5E-02	ND	ND	ND	ND	ND	NS	1.5E+01
MW-38S	ND	ND	ND	ND	ND	ND	8.2E+00	ND	ND	ND	ND	3.5E-01	ND	1.8E-01	ND	ND	ND	ND	NS	8.7E+00

Table 7-3. Summary of Estimated Potential Noncancer Hazard Indices: Future Hypothetical Adult Groundwater User – Well-Specific

Well ID	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc	Cumulative Estimated Noncancer Hazard Index
MW-38D	NS	NS	ND	ND	NS	NS	2.0E+00	NS	ND	ND	NS	4.4E-01	ND	2.5E-01	ND	NS	NS	ND	NS	2.7E+00
MW-39-50	NS	NS	NS	ND	NS	NS	1.6E+01	NS	NS	ND	NS	NS	NS	1.1E-01	NS	NS	NS	NS	NS	1.6E+01
MW-39-60	ND	ND	ND	ND	ND	ND	2.7E+01	ND	ND	ND	ND	ND	ND	1.1E-01	ND	ND	ND	ND	NS	2.7E+01
MW-39-70	NS	NS	NS	ND	NS	NS	4.0E+01	NS	NS	ND	NS	NS	NS	1.5E-01	NS	NS	NS	NS	NS	4.0E+01
MW-39-80	NS	NS	NS	ND	NS	NS	4.1E+01	NS	NS	ND	NS	NS	NS	1.5E-01	NS	NS	NS	NS	NS	4.1E+01
MW-39-100	NS	NS	NS	ND	NS	NS	7.3E+01	NS	NS	ND	NS	NS	NS	1.7E-01	NS	NS	NS	NS	NS	7.3E+01
MW-40S	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1E-01	ND	ND	ND	ND	NS	1.1E-01
MW-40D	NS	NS	ND	ND	NS	NS	7.7E-01	NS	ND	ND	NS	2.5E-01	ND	3.4E-01	ND	NS	NS	ND	NS	1.4E+00
MW-43-25	ND	ND	2.2E+00	ND	1.5E-02	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	ND	NS	2.3E+00
MW-44-115	NS	ND	ND	ND	ND	ND	1.2E+01	ND	ND	NS	ND	4.7E-01	ND	ND	ND	ND	ND	ND	NS	1.3E+01
MW-44-125	NS	NS	ND	ND	NS	NS	3.5E+00	NS	ND	ND	NS	6.9E-01	ND	1.1E-01	ND	NS	NS	ND	NS	4.3E+00
MW-45-095a	NS	NS	ND	ND	NS	NS	2.4E+00	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	NS	2.4E+00
MW-46-175	NS	NS	ND	ND	NS	NS	1.6E+00	NS	ND	ND	NS	1.1E+00	ND	ND	ND	NS	NS	ND	NS	2.7E+00
MW-47-55	NS	NS	ND	ND	NS	NS	5.1E-01	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	NS	5.1E-01
MW-50-095	NS	NS	NS	NS	NS	NS	2.5E+00	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	2.5E+00
MW-50-200	NS	ND	ND	ND	ND	ND	1.0E+02	ND	ND	NS	ND	3.0E-01	ND	1.0E-01	ND	ND	ND	ND	NS	1.0E+02
MW-51	NS	ND	ND	ND	ND	ND	4.3E+01	ND	ND	NS	ND	2.2E-01	ND	2.4E-01	1.0E-01	ND	ND	ND	NS	4.4E+01
OW-1S	3.2E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	3.2E-03
OW-1M	3.1E-03	ND	ND	ND	3.4E-02	ND	ND	ND	1.4E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	5.2E-02
OW-1D	ND	ND	ND	ND	3.9E-02	ND	ND	ND	1.5E-02	ND	ND	1.8E-01	ND	ND	ND	ND	ND	3.0E-01	NS	5.3E-01
OW-2S	4.2E-03	ND	ND	ND	2.5E-02	ND	3.7E-01	ND	ND	ND	ND	2.6E-01	ND	8.5E-02	ND	ND	ND	ND	NS	7.4E-01
OW-2M	ND	ND	ND	ND	3.2E-02	ND	ND	ND	1.4E-02	ND	ND	ND	ND	6.1E-02	ND	ND	ND	ND	NS	1.1E-01
OW-2D	ND	ND	ND	ND	3.2E-02	ND	ND	ND	1.3E-02	ND	ND	2.3E-01	1.9E-02	8.3E-02	ND	4.7E-02	ND	ND	NS	4.2E-01
OW-3D	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.4E-01	ND	ND	ND	ND	ND	ND	NS	2.4E-01
OW-5S	2.7E-03	ND	ND	ND	ND	ND	2.5E-01	1.1E-01	1.0E-02	ND	ND	ND	ND	7.7E-02	ND	3.6E-01	ND	ND	NS	8.1E-01
OW-5M	2.1E-02	7.6E-01	ND	ND	1.2E-01	5.8E-01	ND	9.2E-01	ND	ND	ND	1.7E-01	2.8E-02	ND	1.0E-01	1.1E-01	ND	2.4E-01	NS	3.1E+00
OW-5D	5.6E-03	ND	ND	ND	3.4E-02	ND	ND	ND	1.0E-02	ND	ND	2.6E-01	ND	ND	ND	ND	ND	2.8E-01	NS	5.9E-01
PE-1	NS	NS	ND	ND	NS	NS	9.2E-01	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS	9.2E-01
PGE-6	NS	NS	NS	ND	NS	NS	1.1E+01	NS	9.9E-03	ND	NS	ND	8.6E-03	ND	NS	NS	NS	ND	6.2E-02	1.1E+01
PGE-7	NS	NS	NS	ND	NS	NS	5.2E+01	NS	1.3E-02	ND	NS	3.1E-01	1.1E-02	1.8E-01	NS	NS	NS	ND	4.8E-03	5.2E+01
PGE-8	NS	NS	NS	ND	NS	NS	ND	NS	ND	ND	NS	4.3E-01	1.8E-02	ND	NS	NS	NS	ND	2.8E-02	4.8E-01
Park Moabi-4	NS	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	4.5E-01	ND	ND	ND	ND	5.5E-02	5.0E-01
PT-1D	NS	NS	ND	NS	NS	NS	2.8E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	2.8E+01
PT-2D	NS	NS	ND	NS	NS	NS	2.1E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	2.1E+01
PT-3D	NS	NS	ND	NS	NS	NS	4.1E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	4.1E+01
PT-4D	NS	NS	ND	NS	NS	NS	5.5E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	5.5E+01
PT-5D	NS	NS	ND	NS	NS	NS	5.7E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	5.7E+01
PT-6D	NS	NS	ND	NS	NS	NS	3.1E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	3.1E+01
PT-7S	NS	NS	ND	NS	NS	NS	1.1E+01	NS	NS	NS	NS	NS	NS	3.8E-01	NS	NS	NS	NS	NS	1.1E+01
PT-7M	NS	NS	ND	NS	NS	NS	2.1E+01	NS	NS	NS	NS	NS	NS	4.3E-01	NS	NS	NS	NS	NS	2.2E+01
PT-7D	NS	NS	ND	NS	NS	NS	6.7E+01	NS	NS	NS	NS	NS	NS	1.3E-01	NS	NS	NS	NS	NS	6.7E+01
PT-8S	NS	NS	ND	NS	NS	NS	1.6E+01	NS	NS	NS	NS	NS	NS	4.3E-01	NS	NS	NS	NS	NS	1.7E+01
PT-8M	NS	NS	ND	NS	NS	NS	3.7E+01	NS	NS	NS	NS	NS	NS	5.5E-01	NS	NS	NS	NS	NS	3.7E+01
PT-8D	NS	NS	ND	NS	NS	NS	6.0E+01	NS	NS	NS	NS	NS	NS	1.7E-01	NS	NS	NS	NS	NS	6.1E+01
PT-9S	NS	NS	ND	NS	NS	NS	1.1E+01	NS	NS	NS	NS	NS	NS	2.8E-01	NS	NS	NS	NS	NS	1.1E+01
PT-9M	NS	NS	ND	NS	NS	NS	2.2E+01	NS	NS	NS	NS	NS	NS	4.2E-01	NS	NS	NS	NS	NS	2.2E+01
PT-9D	NS	NS	ND	NS	NS	NS	1.4E+02	NS	NS	NS	NS	NS	NS	1.6E-01	NS	NS	NS	NS	NS	1.5E+02

Table 7-3. Summary of Estimated Potential Noncancer Hazard Indices: Future Hypothetical Adult Groundwater User – Well-Specific

Well ID	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc	Cumulative Estimated Noncancer Hazard Index
PTI-1D	NS	NS	ND	NS	NS	NS	3.1E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	3.1E+01
PTR-1	NS	NS	ND	NS	NS	NS	5.0E+00	NS	NS	NS	NS	NS	NS	3.2E-01	NS	NS	NS	NS	NS	5.3E+00
PTR-2	NS	NS	ND	NS	NS	NS	2.9E+01	NS	NS	NS	NS	NS	NS	4.4E-01	NS	NS	NS	NS	NS	3.0E+01
TW-1	ND	ND	ND	ND	ND	ND	4.3E+01	ND	ND	NS	ND	ND	ND	9.3E-02	8.5E-01	4.8E-01	ND	ND	1.0E-02	4.4E+01
TW-2S	3.9E-03	1.1E+01	ND	ND	ND	ND	4.5E+01	ND	ND	ND	ND	ND	ND	1.2E-01	1.1E-01	ND	ND	ND	2.0E-02	5.6E+01
TW-2D	ND	1.1E+01	ND	ND	ND	ND	5.1E+01	ND	ND	ND	ND	2.8E-01	ND	ND	ND	ND	ND	ND	NS	6.2E+01
TW-3D	NS	NS	ND	NS	NS	NS	2.6E+01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	2.6E+01
TW-4	NS	NS	NS	NS	NS	NS	3.3E-01	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	3.3E-01
CW-1M	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.8E-01	2.3E-02	4.1E-01
CW-1D	3.2E-03	ND	ND	ND	3.3E-02	ND	ND	ND	ND	ND	ND	2.2E-01	ND	ND	ND	ND	ND	3.5E-01	1.0E-02	6.2E-01
CW-2M	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.9E-01	2.0E-02	5.1E-01
CW-2D	ND	ND	ND	ND	3.3E-02	ND	ND	ND	ND	2.0E+00	ND	3.4E-01	ND	ND	ND	ND	ND	4.8E-01	NS	2.8E+00
CW-3M	ND	ND	ND	ND	2.6E-02	ND	ND	ND	ND	ND	ND	1.6E-01	ND	7.3E-02	ND	ND	ND	3.9E-01	NS	6.5E-01
CW-3D	ND	ND	ND	ND	3.3E-02	ND	ND	ND	ND	ND	ND	3.6E-01	ND	ND	ND	ND	5.1E-01	4.5E-01	NS	1.4E+00
CW-4M	ND	ND	ND	ND	2.2E-02	ND	ND	ND	1.5E-02	ND	ND	ND	ND	ND	ND	ND	ND	3.7E-01	NS	4.1E-01
CW-4D	ND	ND	ND	ND	2.8E-02	ND	ND	ND	1.1E-02	ND	ND	2.3E-01	ND	ND	ND	ND	ND	4.3E-01	NS	7.0E-01

Notes:

(1) Hazard indices for all pathways and receptors are presented in Appendix O.

ND = not detected or not detected above background concentrations.

NS = not sampled

Table 7-4. Percentage Contributions by COPCs to Estimated Potential Cumulative Noncancer Hazard Indices: Future Hypothetical Child Groundwater User – Well-Specific

Well	Cumulative Estimated Noncancer Hazard Index	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc
MW-1	9.9E+00	0	ND	ND	ND	ND	ND	ND	ND	ND	86	ND	10	1	3	ND	ND	ND	ND	ND
MW-3	1.0E+00	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	43	13	43	ND	ND	ND	ND	ND
MW-4	3.3E-01	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22	77	ND	ND	ND	ND	ND
MW-5	2.3E+00	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	52	3	34	12	ND	ND	ND	ND
MW-6	9.2E+00	0	ND	ND	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-7	3.8E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	83	ND	ND	ND	ND	ND
MW-8	2.0E+00	ND	ND	ND	ND	ND	ND	55	ND	1	ND	ND	ND	3	41	ND	ND	ND	ND	ND
MW-9	8.7E+00	ND	ND	ND	ND	ND	ND	86	ND	0	ND	ND	ND	0	10	2	1	ND	ND	1
MW-10	7.5E+01	0	1	ND	ND	ND	ND	58	ND	0	35	ND	3	0	1	0	1	ND	1	0
MW-11	1.9E+01	ND	ND	ND	0	ND	ND	97	ND	0	ND	ND	ND	0	2	1	ND	ND	ND	0
MW-12	5.8E+01	0	6	39	ND	ND	ND	50	ND	0	ND	ND	1	0	ND	ND	ND	2	1	ND
MW-13	1.4E-01	ND	ND	ND	ND	ND	ND	ND	ND	7	ND	ND	ND	60	ND	ND	ND	ND	ND	32
MW-14	1.5E+00	ND	ND	ND	ND	ND	ND	61	14	1	ND	ND	ND	3	19	ND	ND	ND	ND	2
MW-15	8.2E-01	NS	NS	ND	ND	NS	NS	43	NS	2	ND	NS	ND	3	47	ND	NS	NS	ND	5
MW-19	2.0E+01	ND	ND	ND	ND	ND	ND	100	ND	0	ND	ND	ND	0	ND	ND	ND	ND	ND	0
MW-20-70	2.1E+02	ND	1	ND	ND	ND	ND	99	ND	0	ND	ND	ND	0	0	0	ND	ND	0	0
MW-20-100	1.7E+02	NS	4	ND	ND	ND	ND	95	ND	0	ND	ND	ND	0	0	ND	ND	ND	ND	0
MW-20-130	1.9E+02	ND	ND	ND	ND	ND	ND	99	0	0	ND	ND	0	0	0	0	ND	ND	0	0
MW-21	1.4E+00	ND	ND	ND	ND	ND	ND	ND	ND	3	ND	ND	47	11	ND	34	ND	ND	ND	5
MW-22	4.6E+00	NS	ND	ND	3	ND	ND	ND	23	3	ND	2	16	10	6	ND	ND	ND	36	1
MW-23	2.2E+00	NS	ND	ND	78	ND	ND	ND	ND	1	ND	ND	ND	12	ND	6	ND	ND	ND	3
MW-24A	8.2E+01	NS	ND	9	0	ND	ND	88	ND	0	ND	ND	1	0	1	1	ND	ND	ND	0
MW-24B	1.1E+02	ND	ND	ND	ND	ND	ND	98	ND	0	ND	ND	1	0	1	0	ND	ND	ND	0
MW-24BR	8.4E+00	NS	NS	NS	1	NS	NS	89	NS	0	ND	NS	9	0	ND	NS	NS	NS	ND	0
MW-25	5.1E+01	ND	ND	ND	ND	ND	ND	100	ND	0	ND	ND	ND	0	ND	0	ND	ND	ND	0
MW-26	8.2E+01	NS	ND	ND	ND	ND	ND	99	ND	0	ND	ND	1	0	0	0	ND	ND	ND	0
MW-27-20	3.0E-01	ND	NS	NS	28	NS	NS	ND	NS	10	ND	NS	ND	49	ND	NS	NS	NS	ND	13
MW-28-25	1.5E-01	ND	NS	NS	51	NS	NS	ND	NS	9	ND	NS	ND	19	ND	NS	NS	NS	ND	21
MW-29	1.8E-01	NS	NS	NS	53	NS	NS	ND	NS	9	ND	NS	ND	18	ND	NS	NS	NS	ND	20
MW-30-30	5.0E+00	ND	ND	ND	7	ND	ND	ND	ND	1	ND	ND	26	17	12	ND	ND	ND	37	1
MW-30-50	2.9E+01	NS	NS	NS	ND	NS	NS	100	NS	0	ND	NS	NS	ND	ND	NS	NS	NS	NS	0
MW-31-60	8.5E+01	ND	ND	ND	ND	ND	ND	98	ND	0	ND	ND	ND	0	0	ND	ND	ND	1	0
MW-31-135	6.1E+00	NS	NS	ND	ND	NS	NS	100	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	ND
MW-32-20	1.7E+00	ND	NS	NS	99	NS	NS	ND	NS	ND	ND	NS	NS	ND	ND	NS	NS	NS	NS	1
MW-32-35	6.8E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	ND	100
MW-33-40	9.5E+00	ND	NS	NS	ND	NS	NS	ND	NS	0	99	NS	NS	ND	ND	NS	NS	NS	NS	0

Table 7-4. Percentage Contributions by COPCs to Estimated Potential Cumulative Noncancer Hazard Indices: Future Hypothetical Child Groundwater User – Well-Specific

Well	Cumulative Estimated Noncancer Hazard Index	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc
MW-33-90	1.0E+00	ND	ND	ND	ND	ND	ND	ND	ND	48	ND	ND	46	ND	ND	ND	ND	ND	ND	7
MW-33-210	2.7E-01	ND	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-34-55	7.6E+00	ND	55	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	0	NS	2	7	ND	35	ND
MW-34-80	3.3E-01	1	ND	ND	ND	ND	ND	ND	86	5	ND	ND	ND	8	NS	ND	ND	ND	ND	ND
MW-34-100	1.6E+01	ND	ND	ND	ND	ND	ND	97	ND	ND	ND	ND	3	ND	ND	ND	ND	ND	ND	ND
MW-35-60	8.0E-01	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-35-135	5.7E-01	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-36-90	5.5E+01	NS	NS	NS	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-36-100	3.3E+01	NS	NS	NS	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-37D	3.5E+01	ND	ND	ND	ND	ND	ND	97	1	ND	ND	ND	2	0	ND	ND	ND	ND	ND	ND
MW-38S	2.0E+01	ND	ND	ND	ND	ND	ND	94	ND	ND	ND	ND	4	ND	2	ND	ND	ND	ND	ND
MW-38D	6.3E+00	NS	NS	ND	ND	NS	NS	75	NS	ND	ND	NS	16	ND	9	ND	NS	NS	ND	ND
MW-39-50	3.7E+01	NS	NS	NS	ND	NS	NS	99	NS	NS	ND	NS	NS	NS	1	NS	NS	NS	NS	NS
MW-39-60	6.3E+01	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	ND	ND
MW-39-70	9.3E+01	NS	NS	NS	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	0	NS	NS	NS	NS	NS
MW-39-80	9.5E+01	NS	NS	NS	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	0	NS	NS	NS	NS	NS
MW-39-100	1.7E+02	NS	NS	NS	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	0	NS	NS	NS	NS	NS
MW-40S	2.7E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND
MW-40D	3.2E+00	NS	NS	ND	ND	NS	NS	57	NS	ND	ND	NS	19	ND	25	ND	NS	NS	ND	ND
MW-43-25	5.3E+00	ND	ND	99	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	ND	ND
MW-44-115	3.0E+01	NS	ND	ND	ND	ND	ND	96	ND	ND	NS	ND	4	ND	ND	ND	ND	ND	ND	ND
MW-44-125	1.0E+01	NS	NS	ND	ND	NS	NS	81	NS	ND	ND	NS	16	ND	3	ND	NS	NS	ND	ND
MW-45-095a	5.6E+00	NS	NS	ND	ND	NS	NS	100	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	ND
MW-46-175	6.3E+00	NS	NS	ND	ND	NS	NS	60	NS	ND	ND	NS	40	ND	ND	ND	NS	NS	ND	ND
MW-47-55	1.2E+00	NS	NS	ND	ND	NS	NS	100	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	ND
MW-50-095	5.9E+00	NS	NS	NS	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-50-200	2.4E+02	NS	ND	ND	ND	ND	ND	100	ND	ND	NS	ND	0	ND	0	ND	ND	ND	ND	ND
MW-51	1.0E+02	NS	ND	ND	ND	ND	ND	99	ND	ND	NS	ND	1	ND	1	0	ND	ND	ND	ND
OW-1S	7.6E-03	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OW-1M	1.2E-01	6	ND	ND	ND	66	ND	ND	ND	28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OW-1D	1.2E+00	ND	ND	ND	ND	7	ND	ND	ND	3	ND	ND	34	ND	ND	ND	ND	ND	56	ND
OW-2S	1.7E+00	1	ND	ND	ND	3	ND	49	ND	ND	ND	ND	35	ND	11	ND	ND	ND	ND	ND
OW-2M	2.5E-01	ND	ND	ND	ND	30	ND	ND	ND	13	ND	ND	ND	ND	57	ND	ND	ND	ND	ND
OW-2D	9.8E-01	ND	ND	ND	ND	8	ND	ND	ND	3	ND	ND	54	4	20	ND	11	ND	ND	ND
OW-3D	5.6E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND
OW-5S	1.9E+00	0	ND	ND	ND	ND	ND	31	14	1	ND	ND	ND	ND	10	ND	44	ND	ND	ND

Table 7-4. Percentage Contributions by COPCs to Estimated Potential Cumulative Noncancer Hazard Indices: Future Hypothetical Child Groundwater User – Well-Specific

Well	Cumulative Estimated Noncancer Hazard Index	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc
OW-5M	7.1E+00	1	25	ND	ND	4	19	ND	30	ND	ND	ND	6	1	ND	3	4	ND	8	ND
OW-5D	1.4E+00	1	ND	ND	ND	6	ND	ND	ND	2	ND	ND	44	ND	ND	ND	ND	ND	47	ND
PE-1	2.2E+00	NS	NS	ND	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS
PGE-6	2.6E+01	NS	NS	NS	ND	NS	NS	99	NS	0	ND	NS	ND	0	ND	NS	NS	NS	ND	1
PGE-7	1.2E+02	NS	NS	NS	ND	NS	NS	99	NS	0	ND	NS	1	0	0	NS	NS	NS	ND	0
PGE-8	1.1E+00	NS	NS	NS	ND	NS	NS	ND	NS	ND	ND	NS	90	4	ND	NS	NS	NS	ND	6
Park Moabi-4	1.2E+00	NS	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	89	ND	ND	ND	ND	11
PT-1D	6.6E+01	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-2D	5.0E+01	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-3D	9.6E+01	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-4D	1.3E+02	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-5D	1.3E+02	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-6D	7.1E+01	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-7S	2.7E+01	NS	NS	ND	NS	NS	NS	97	NS	NS	NS	NS	NS	NS	3	NS	NS	NS	NS	NS
PT-7M	5.1E+01	NS	NS	ND	NS	NS	NS	98	NS	NS	NS	NS	NS	NS	2	NS	NS	NS	NS	NS
PT-7D	1.6E+02	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	0	NS	NS	NS	NS	NS
PT-8S	3.9E+01	NS	NS	ND	NS	NS	NS	97	NS	NS	NS	NS	NS	NS	3	NS	NS	NS	NS	NS
PT-8M	8.7E+01	NS	NS	ND	NS	NS	NS	99	NS	NS	NS	NS	NS	NS	1	NS	NS	NS	NS	NS
PT-8D	1.4E+02	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	0	NS	NS	NS	NS	NS
PT-9S	2.6E+01	NS	NS	ND	NS	NS	NS	97	NS	NS	NS	NS	NS	NS	3	NS	NS	NS	NS	NS
PT-9M	5.2E+01	NS	NS	ND	NS	NS	NS	98	NS	NS	NS	NS	NS	NS	2	NS	NS	NS	NS	NS
PT-9D	3.4E+02	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	0	NS	NS	NS	NS	NS
PTI-1D	7.2E+01	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PTR-1	1.2E+01	NS	NS	ND	NS	NS	NS	94	NS	NS	NS	NS	NS	NS	6	NS	NS	NS	NS	NS
PTR-2	7.0E+01	NS	NS	ND	NS	NS	NS	99	NS	NS	NS	NS	NS	NS	1	NS	NS	NS	NS	NS
TW-1	1.0E+02	ND	ND	ND	ND	ND	ND	97	ND	ND	NS	ND	ND	ND	0	2	1	ND	ND	0
TW-2S	1.3E+02	0	19	ND	ND	ND	ND	81	ND	ND	ND	ND	ND	ND	0	0	ND	ND	ND	0
TW-2D	1.4E+02	ND	17	ND	ND	ND	ND	82	ND	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND
TW-3D	6.1E+01	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
TW-4	7.7E-01	NS	NS	NS	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
CW-1M	9.5E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	94	6
CW-1D	1.4E+00	1	ND	ND	ND	5	ND	ND	ND	ND	ND	ND	36	ND	ND	ND	ND	ND	57	2
CW-2M	1.2E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	96	4
CW-2D	6.7E+00	ND	ND	ND	ND	1	ND	ND	ND	ND	70	ND	12	ND	ND	ND	ND	ND	17	ND
CW-3M	1.5E+00	ND	ND	ND	ND	4	ND	ND	ND	ND	ND	ND	25	ND	11	ND	ND	ND	59	ND
CW-3D	3.2E+00	ND	ND	ND	ND	2	ND	ND	ND	ND	ND	ND	27	ND	ND	ND	ND	38	33	ND

Table 7-4. Percentage Contributions by COPCs to Estimated Potential Cumulative Noncancer Hazard Indices: Future Hypothetical Child Groundwater User – Well-Specific

Well	Cumulative Estimated Noncancer Hazard Index	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc
CW-4M	9.6E-01	ND	ND	ND	ND	5	ND	ND	ND	4	ND	ND	ND	ND	ND	ND	ND	ND	91	ND
CW-4D	1.6E+00	ND	ND	ND	ND	4	ND	ND	ND	2	ND	ND	33	ND	ND	ND	ND	ND	61	ND

Notes:

(1) Shown is the percentage contribution by COPCs to the estimated potential cumulative noncancer hazard index for the hypothetical child groundwater user.

COPC = constituent of potential concern
ND = not detected or not detected above background concentrations
NS = not sampled

Table 7-5. Comparison of Estimated Lead EPCs to the California Action Level – Well-Specific

Well	Estimated EPC (mg/L)	Screening Criteria (mg/L)	Ratio of EPC to Screening Criteria
MW-9	0.00317	0.015	0.21
MW-10	0.00249	0.015	0.17
MW-11	0.006	0.015	0.40
MW-12	0.0067	0.015	0.45
MW-14	0.0026	0.015	0.17
MW-15	0.0039	0.015	0.26
MW-20-70	0.003	0.015	0.20
MW-20-100	0.017	0.015	1.1
MW-20-130	0.042	0.015	2.8
MW-22	0.076	0.015	5.1
MW-23	0.027	0.015	1.8
MW-26	0.0021	0.015	0.14
MW-27-20	0.024	0.015	1.6
MW-28-25	0.014	0.015	0.93
MW-29	0.0033	0.015	0.22
MW-30-30	0.073	0.015	4.9
MW-31-60	0.021	0.015	1.4
MW-34-55	0.0122	0.015	0.81
MW-43-25	0.0059	0.015	0.39
MW-51	0.0058	0.015	0.39
OW-1S	0.0047	0.015	0.31
OW-1M	0.0049	0.015	0.33
OW-2M	0.0032	0.015	0.21
OW-2D	0.0029	0.015	0.19
OW-3S	0.0046	0.015	0.31
OW-3D	0.0024	0.015	0.16
OW-5S	0.0028	0.015	0.19
OW-5M	0.0102	0.015	0.68
OW-5D	0.0037	0.015	0.25
PGE-6	0.006	0.015	0.40
TW-1	0.0051	0.015	0.34
CW-1M	0.0054	0.015	0.36

Table 7-5. Comparison of Estimated Lead EPCs to the California Action Level – Well-Specific

Well	Estimated EPC (mg/L)	Screening Criteria (mg/L)	Ratio of EPC to Screening Criteria
CW-1D	0.0036	0.015	0.24
CW-2M	0.0067	0.015	0.45
CW-3M	0.0029	0.015	0.19
CW-4M	0.0055	0.015	0.37

Notes:

(1) Screening criteria for lead is the California Action Level for lead because no MCL is promulgated.

(2) California Action Level for lead provided in CCR Title 22, Division 4, Chapter 17.5, Article 3, Section 64678.

(3) Wells where lead was either not detected or not sampled are not shown.

CCR = California Code of Regulations
EPC = exposure point concentration
MCL = maximum contaminant limit
mg/L = milligram(s) per liter

Table 7-6. Summary of Estimated Potential Human Health Risk Assessment Results: Hypothetical Future Groundwater User

Chemical of Potential Concern	Number of Wells Sampled	Number of Wells Exceeding Cumulative Hazard Threshold	Frequency	Average Hazard Index at Wells where Chemical is Driving Risk	Number of Wells Exceeding Cumulative Hazard Threshold – Sensitivity Analysis	Frequency	Average Hazard Index at Wells where Chemical is Driving Risk – Sensitivity Analysis	Total Number of Samples	Number of Detections	Number of Wells Exceeding Background Levels	Frequency
Aluminum	64	0	0.0%	NA	0	0.0%	NA	294	21	16	25.0%
Antimony	68	7	10.3%	9.6E+00	3	4.4%	7.9E+00	384	9	8	11.8%
Arsenic	110	3	2.7%	1.2E+01	3	2.7%	1.0E+01	460	190	3	2.7%
Barium	107	2	1.9%	1.7E+00	1	0.9%	1.7E+00	559	361	10	9.3%
Beryllium	68	0	0.0%	NA	0	0.0%	NA	374	20	14	20.6%
Cadmium	68	1	1.5%	1.4E+00	0	0.0%	NA	374	1	1	1.5%
Chromium, hexavaler	167	65	38.9%	6.6E+01	64	38.3%	6.5E+01	2,780	1650	69	41.3%
Cobalt	68	2	2.9%	1.6E+00	2	2.9%	6.2E-01	374	13	8	11.8%
Copper	86	0	0.0%	NA	0	0.0%	NA	1,049	358	40	46.5%
Fluoride	104	5	4.8%	1.2E+01	5	4.8%	8.4E+00	491	426	5	4.8%
Lead	83	7	8.4%	2.7E+00	2	2.4%	1.8E+00	474	62	36	43.4%
Mercury	68	0	0.0%	NA	0	0.0%	NA	380	1	1	1.5%
Molybdenum	83	17	20.5%	1.1E+00	14	16.9%	1.0E+00	563	528	38	45.8%
Nickel	86	2	2.3%	6.6E-01	2	2.3%	6.6E-01	1,049	479	38	44.2%
Nitrate as nitrogen	165	8	4.8%	8.4E-01	3	1.8%	7.7E-01	844	573	52	31.5%
Selenium	76	2	2.6%	1.3E+00	1	1.3%	1.4E+00	396	168	17	22.4%
Silver	68	3	4.4%	9.2E-01	0	0.0%	NA	374	8	7	10.3%
Thallium	68	2	2.9%	1.1E+00	2	2.9%	2.6E+00	374	2	2	2.9%
Vanadium	83	17	20.5%	1.1E+00	9	10.8%	8.7E-01	462	372	19	22.9%
Zinc	86	0	0.0%	NA	0	0.0%	NA	1,049	725	37	43.0%

Notes:

(1) See Appendix P for an explanation of methodologies used in determining material contributors to elevated hazard.

(2) As described in Section 6.3 of the text, the noncarcinogenic hazard from lead is not evaluated using the traditional reference dose approach. Well-specific lead EPCs are instead compared to the California Action Level for lead, which is a legally enforceable drinking water standard designed to protect public health. The ratio of the lead EPC to the lead CAL is therefore approximately analogous to hazard index; a ratio above the threshold value of 1.0 indicates potential for adverse health effects to hypothetical future groundwater users.

(3) Estimated potential noncancer hazard indices are presented in Table 7-2.

(4) Estimated EPCs are based on maximum detected concentrations when 95% UCLs OTM cannot be reliably calculated with ProUCL 4.0 because there are less than eight samples or less than five detections in the dataset. The sensitivity analysis bases EPCs on mean concentrations when 95% UCLs OTM cannot be reliably calculated with ProUCL 4.0.

EPC = exposure point concentration
NA = not applicable
OTM = of the mean
UCL = upper confidence limit

Table 8-1. Applicable Drinking Water Criteria

Chemical of Potential Concern	Risk-Based Concentration (mg/L)	California Primary Maximum Contaminant Level (mg/L)	Background UTL (mg/L)
Chromium, hexavalent	4.6E-02	5.0E-02	3.2E-02

Notes:

mg/L = milligram(s) per liter

UTL = upper tolerance limit

Source:

CDPH. 2007. Maximum Contaminant Levels and Regulatory Dates for Drinking Water, U.S. EPA vs. California. California Department of Public Health. September. URL: http://www.cdph.ca.gov/certlic/drinkingwater/Documents/DWdocuments/EPAandCDPH.pdf.

Table 9-1. Statistical Summary of ICOPC Concentrations in Groundwater – Well-Specific – Screened Out by Population Comparisons

Constituent of Potential Concern	Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background Upper Tolerance Limit (UTL) (mg/L)	Number of Detections Above the UTL	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Gehan p-value	Median Test Conclusion	Include in Risk Assessment?
Chromium, hexavalent	MW-23	36	14	0.0011	1.02	0.0318	1	0.0943	Site ≤ Background	Gehan	0.689	Site ≤ Background	N
Chromium, hexavalent	MW-34-80	88	13	0.00086	0.111	0.0318	3	0.00731	Site ≤ Background	Gehan	1	Site ≤ Background	N
Copper	OW-5M	14	5	0.0016	0.0114	0.0105	2	0.00694	Site ≤ Background	Gehan	0.214	Site ≤ Background	N
Nitrate as nitrogen	OW-1M	16	16	0.892	6.49	5.03	1	3.24	Site ≤ Background	Gehan	0.289	Site ≤ Background	N
Nitrate as nitrogen	OW-5D	15	15	0.151	5.99	5.03	1	2.861	Site ≤ Background	Gehan	0.521	Site ≤ Background	N
Nitrate as nitrogen	OW-5M	15	15	0.51	8.155	5.03	1	2.944	Site ≤ Background	Gehan	0.809	Site ≤ Background	N
Selenium	OW-2D	14	5	0.00208	0.0171	0.0103	1	0.00724	Site ≤ Background	Gehan	0.109	Site ≤ Background	N
Vanadium	MW-11	13	13	0.0036	0.0859	0.0599	1	0.0413	Site ≤ Background	Gehan	0.814	Site ≤ Background	N
Vanadium	MW-25	13	11	0.0051	0.0733	0.0599	1	0.036	Site ≤ Background	Gehan	0.857	Site ≤ Background	N
Vanadium	MW-34-80	13	10	0.0016	0.238	0.0599	1	0.204	Site ≤ Background	Gehan	0.996	Site ≤ Background	N
Vanadium	MW-37D	13	11	0.004	0.326	0.0599	1	0.187	Site ≤ Background	Gehan	0.927	Site ≤ Background	N
Vanadium	OW-1M	14	12	0.00184	0.0625	0.0599	1	0.0376	Site ≤ Background	Gehan	0.632	Site ≤ Background	N
Vanadium	OW-2D	14	10	0.00148	0.0862	0.0599	1	0.0455	Site ≤ Background	Gehan	0.724	Site ≤ Background	N
Vanadium	OW-2M	13	11	0.0021	0.0913	0.0599	1	0.0489	Site ≤ Background	Gehan	0.768	Site ≤ Background	N
Zinc	MW-12	41	30	0.0046	0.54	0.0777	4	0.0689	Site ≤ Background	Gehan	0.441	Site ≤ Background	N
Zinc	MW-34-55	14	9	0.0141	0.163	0.0777	2	0.0612	Site ≤ Background	Gehan	0.214	Site ≤ Background	N
Zinc	MW-34-80	18	9	0.0232	0.0854	0.0777	2	0.0465	Site ≤ Background	Gehan	0.481	Site ≤ Background	N
Zinc	MW-37D	13	5	0.011	0.0918	0.0777	1	0.0407	Site ≤ Background	Gehan	0.927	Site ≤ Background	N
Zinc	OW-5M	14	5	0.0238	0.278	0.0777	1	0.0964	Site ≤ Background	Gehan	0.869	Site ≤ Background	N

Notes:

(1) Extracted from Table 4-1b for chemical/well pairs screened-out of the risk assessment by population tests

(2) Data shown here have a detection above the background upper tolerance limit (UTL) and a minimum of eight samples and five detections.

(3) The Quantile Test and a median test (either the Mann-Whitney Test or Gehan Test) were preformed in ProUCL to test the hypothesis that the distribution of concentrations at a given well is below the background distribution.

(4) 95% upper confidence limits (UCL) calculated in ProUCL.

(5) Nitrate as NO_{3^-}, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

(6) Based on the ProUCL manual recommendations, the Gehan test is used for chemicals for which either the background or sample data set has more than 40% nondetects or multiple detection limits. The Mann-Whitney test is used for all other cases.

ICOPC = initial constituent of potential concern
mg/L = milligram(s) per liter

Table 9-2. Groundwater Sampling Results for Well/Chemical Pairs Screened Out by Population Comparisons

Sample ID	Sample Date	Well ID	Result (mg/L)	Nondetect?
Hexavalent Chromium				
MW-23_03/25/2000	03/25/2000	MW-23	0.01	ND
MW-23_03/28/2001	03/28/2001	MW-23	0.01	ND
MW-23_06/06/2001	06/06/2001	MW-23	0.01	ND
MW-23_06/14/2000	06/14/2000	MW-23	0.01	ND
MW-23_06/15/1998	06/15/1998	MW-23	0.01	ND
MW-23_06/15/1999	06/15/1999	MW-23	0.01	ND
MW-23_09/01/2000	09/01/2000	MW-23	0.01	ND
MW-23_09/12/2001	09/12/2001	MW-23	0.01	ND
MW-23_09/14/1999	09/14/1999	MW-23	0.01	ND
MW-23_11/30/2001	11/30/2001	MW-23	0.01	ND
MW-23_12/01/1999	12/01/1999	MW-23	0.01	ND
MW-23_12/01/2000	12/01/2000	MW-23	0.01	ND
MW-23_12/11/02_LS	12/11/2002	MW-23	0.01	ND
MW-23-001_03/08/2002	03/08/2002	MW-23	0.01	ND
MW-23-002_6/13/02	06/13/2002	MW-23	0.01	ND
MW-23-003	09/18/2002	MW-23	0.01	ND
MW-23-005	03/21/2003	MW-23	0.01	ND
MW-23-006	06/12/2003	MW-23	0.01	ND
MW-23-007	09/10/2003	MW-23	0.0002	ND
MW-23-009	12/11/2003	MW-23	0.0002	ND
MW-23-018	03/16/2004	MW-23	0.0033	
MW-23-030	06/08/2004	MW-23	0.0101	
MW-23-043	09/21/2004	MW-23	0.0068	
MW-23-049	12/17/2004	MW-23	0.0011	
MW-23-056	03/08/2005	MW-23	0.001	ND
MW-23-070	06/14/2005	MW-23	0.0089	
MW-23-081	10/04/2005	MW-23	0.001	ND
MW-23-087	12/14/2005	MW-23	0.0088	
MW-23-093	03/08/2006	MW-23	0.0119	
MW-23-098	05/02/2006	MW-23	0.0168	
MW-23-110	10/04/2006	MW-23	0.0152	
MW-23-115	12/12/2006	MW-23	0.0144	
MW-23-121	03/06/2007	MW-23	1.02	
MW-23-125	05/02/2007	MW-23	0.013	
MW-23-136	10/04/2007	MW-23	0.0192	
MW-23-143	05/06/2008	MW-23	0.0232	
MW-34/80-009	12/11/2003	MW-34-80	0.0377	
MW-34-080-056	03/08/2005	MW-34-80	0.001	ND
MW-34-080-057	03/15/2005	MW-34-80	0.001	ND
MW-34-080-058	03/22/2005	MW-34-80	0.001	ND
MW-34-080-059	03/29/2005	MW-34-80	0.001	ND
MW-34-080-061	04/12/2005	MW-34-80	0.001	ND
MW-34-080-062	04/19/2005	MW-34-80	0.001	ND
MW-34-080-063	04/26/2005	MW-34-80	0.001	ND
MW-34-080-064	05/04/2005	MW-34-80	0.001	ND

Table 9-2. Groundwater Sampling Results for Well/Chemical Pairs Screened Out by Population Comparisons

Sample ID	Sample Date	Well ID	Result (mg/L)	Nondetect?
MW-34-080-066	05/18/2005	MW-34-80	0.001	ND
MW-34-080-068	06/01/2005	MW-34-80	0.001	ND
MW-34-080-070	06/30/2005	MW-34-80	0.001	ND
MW-34-080-074	07/14/2005	MW-34-80	0.001	ND
MW-34-080-077	08/15/2005	MW-34-80	0.001	ND
MW-34-080-079	09/07/2005	MW-34-80	0.001	ND
MW-34-080-081	10/05/2005	MW-34-80	0.001	ND
MW-34-080-083	11/03/2005	MW-34-80	0.001	ND
MW-34-080-087	12/14/2005	MW-34-80	0.001	ND
MW-34-080-089	01/11/2006	MW-34-80	0.001	ND
MW-34-080-091	02/08/2006	MW-34-80	0.001	ND
MW-34-080-093	03/09/2006	MW-34-80	0.001	ND
MW-34-080-095	04/03/2006	MW-34-80	0.001	ND
MW-34-080-098	05/03/2006	MW-34-80	0.001	ND
MW-34-080-102	06/14/2006	MW-34-80	0.001	ND
MW-34-080-104	07/12/2006	MW-34-80	0.001	ND
MW-34-080-106	08/08/2006	MW-34-80	0.001	ND
MW-34-080-108	09/06/2006	MW-34-80	0.001	ND
MW-34-080-110	10/04/2006	MW-34-80	0.001	ND
MW-34-080-113	11/16/2006	MW-34-80	0.001	ND
MW-34-080-115	12/12/2006	MW-34-80	0.001	ND
MW-34-080-117	01/09/2007	MW-34-80	0.001	ND
MW-34-080-119	02/05/2007	MW-34-80	0.001	ND
MW-34-080-121	03/05/2007	MW-34-80	0.001	ND
MW-34-080-123	04/02/2007	MW-34-80	0.0002	ND
MW-34-080-125	04/30/2007	MW-34-80	0.001	ND
MW-34-080-128	06/13/2007	MW-34-80	0.001	ND
MW-34-080-130	07/11/2007	MW-34-80	0.001	ND
MW-34-080-132	08/08/2007	MW-34-80	0.001	ND
MW-34-080-134	09/06/2007	MW-34-80	0.001	ND
MW-34-080-136	10/03/2007	MW-34-80	0.0002	ND
MW-34-080-143	05/06/2008	MW-34-80	0.0002	ND
MW-34-80-006-AT	06/16/2003	MW-34-80	0.01	ND
MW-34-80-006-BT	06/17/2003	MW-34-80	0.01	ND
MW-34-80-011	01/29/2004	MW-34-80	0.111	
MW-34-80-012	02/05/2004	MW-34-80	0.0129	
MW-34-80-015	02/26/2004	MW-34-80	0.092	
MW-34-80-016	03/05/2004	MW-34-80	0.0256	
MW-34-80-017	03/11/2004	MW-34-80	0.0073	
MW-34-80-018	03/17/2004	MW-34-80	0.0057	
MW-34-80-019	03/25/2004	MW-34-80	0.0037	
MW-34-80-020	04/01/2004	MW-34-80	0.0022	
MW-34-80-021	04/08/2004	MW-34-80	0.002	
MW-34-80-022	04/16/2004	MW-34-80	0.00086	
MW-34-80-023	04/22/2004	MW-34-80	0.00087	
MW-34-80-024	04/29/2004	MW-34-80	0.002	ND

Table 9-2. Groundwater Sampling Results for Well/Chemical Pairs Screened Out by Population Comparisons

Sample ID	Sample Date	Well ID	Result (mg/L)	Nondetect?
MW-34-80-025	05/06/2004	MW-34-80	0.001	ND
MW-34-80-026	05/13/2004	MW-34-80	0.001	ND
MW-34-80-027	05/20/2004	MW-34-80	0.001	ND
MW-34-80-028	05/27/2004	MW-34-80	0.001	ND
MW-34-80-029	06/02/2004	MW-34-80	0.002	ND
MW-34-80-030	06/08/2004	MW-34-80	0.001	ND
MW-34-80-031	06/17/2004	MW-34-80	0.001	ND
MW-34-80-032	06/23/2004	MW-34-80	0.001	ND
MW-34-80-033	06/30/2004	MW-34-80	0.001	ND
MW-34-80-034	07/07/2004	MW-34-80	0.001	ND
MW-34-80-035	07/15/2004	MW-34-80	0.001	ND
MW-34-80-036	07/21/2004	MW-34-80	0.001	ND
MW-34-80-037	07/27/2004	MW-34-80	0.001	ND
MW-34-80-038	08/05/2004	MW-34-80	0.001	ND
MW-34-80-039	08/12/2004	MW-34-80	0.001	ND
MW-34-80-040	08/20/2004	MW-34-80	0.001	ND
MW-34-80-041	08/26/2004	MW-34-80	0.001	ND
MW-34-80-042	09/08/2004	MW-34-80	0.001	ND
MW-34-80-043	09/23/2004	MW-34-80	0.001	ND
MW-34-80-044	10/06/2004	MW-34-80	0.001	ND
MW-34-80-045	10/20/2004	MW-34-80	0.001	ND
MW-34-80-046	11/02/2004	MW-34-80	0.001	ND
MW-34-80-047	11/17/2004	MW-34-80	0.001	ND
MW-34-80-048	12/02/2004	MW-34-80	0.001	ND
MW-34-80-049	12/13/2004	MW-34-80	0.001	ND
MW-34-80-050	12/29/2004	MW-34-80	0.001	ND
MW-34-80-051	01/12/2005	MW-34-80	0.001	ND
MW-34-80-052	01/27/2005	MW-34-80	0.001	ND
MW-34-80-053	02/08/2005	MW-34-80	0.001	ND
MW-34-80-054	02/22/2005	MW-34-80	0.001	ND
MW-34-80-055	03/01/2005	MW-34-80	0.001	ND
MW-34-80-060	04/05/2005	MW-34-80	0.001	ND
MW-34-80-WV-014	02/18/2004	MW-34-80	0.0204	
Copper				
OW-05M-003	09/13/2005	OW-5M	0.0114	
OW-05M-004	10/20/2005	OW-5M	0.01	ND
OW-05M-005	11/15/2005	OW-5M	0.01	ND
OW-05M-006	12/06/2005	OW-5M	0.01	ND
OW-05M-007	03/15/2006	OW-5M	0.01	ND
OW-05M-008	06/07/2006	OW-5M	0.01	ND
OW-05M-009	08/30/2006	OW-5M	0.01	ND
OW-05M-010	10/11/2006	OW-5M	0.01	ND
OW-05M-012	04/30/2007	OW-5M	0.001	ND
OW-05M-014	10/17/2007	OW-5M	0.00331	
OW-05M-075	07/28/2005	OW-5M	0.005	ND
OW-05M-077	08/26/2005	OW-5M	0.0058	

Table 9-2. Groundwater Sampling Results for Well/Chemical Pairs Screened Out by Population Comparisons

Sample ID	Sample Date	Well ID	Result (mg/L)	Nondetect?
OW-5M-WQ5	01/13/2005	OW-5M	0.0106	
OW-5M-WQ6	05/11/2005	OW-5M	0.0016	
Nitrate as Nitrogen				
OW-01M-003	09/14/2005	OW-1M	1.35	
OW-01M-004	10/19/2005	OW-1M	4.64	
OW-01M-005	11/14/2005	OW-1M	6.49	
OW-01M-006	12/05/2005	OW-1M	2.65	
OW-01M-007	03/14/2006	OW-1M	3.18	
OW-01M-008	06/06/2006	OW-1M	2.73	
OW-01M-009	08/31/2006	OW-1M	2.45	
OW-01M-010	10/10/2006	OW-1M	2.98	
OW-01M-011	01/25/2007	OW-1M	2.43	
OW-01M-012	05/01/2007	OW-1M	1.41	
OW-01M-013	08/09/2007	OW-1M	2.775	
OW-01M-014	10/16/2007	OW-1M	2.56	
OW-01M-075	07/27/2005	OW-1M	1.01	
OW-01M-077	08/25/2005	OW-1M	1.38	
OW-1M	10/01/2004	OW-1M	0.91	
OW-1M-WQ6	05/10/2005	OW-1M	0.892	
OW-05M-003	09/13/2005	OW-5M	0.69	
OW-05M-004	10/20/2005	OW-5M	0.655	
OW-05M-005	11/15/2005	OW-5M	2.05	
OW-05M-006	12/06/2005	OW-5M	0.66	
OW-05M-007	03/15/2006	OW-5M	1.15	
OW-05M-008	06/07/2006	OW-5M	1.4	
OW-05M-009	08/30/2006	OW-5M	2.48	
OW-05M-010	10/11/2006	OW-5M	3.15	
OW-05M-011	01/25/2007	OW-5M	2.5	
OW-05M-012	04/30/2007	OW-5M	2.1	
OW-05M-013	08/08/2007	OW-5M	8.155	
OW-05M-014	10/17/2007	OW-5M	2.72	
OW-05M-075	07/28/2005	OW-5M	0.621	
OW-05M-077	08/26/2005	OW-5M	0.619	
OW-5M-WQ6	05/11/2005	OW-5M	0.51	
OW-05D-003	09/13/2005	OW-5D	0.334	
OW-05D-004	10/19/2005	OW-5D	1.54	
OW-05D-005	11/15/2005	OW-5D	5.99	
OW-05D-006	12/06/2005	OW-5D	2.24	
OW-05D-007	03/15/2006	OW-5D	3.23	
OW-05D-008	06/07/2006	OW-5D	2.72	
OW-05D-009	08/30/2006	OW-5D	2.68	
OW-05D-010	10/11/2006	OW-5D	3.3	
OW-05D-011	01/25/2007	OW-5D	2.7	
OW-05D-012	05/01/2007	OW-5D	1.46	
OW-05D-013	08/09/2007	OW-5D	2.615	
OW-05D-014	10/17/2007	OW-5D	2.83	

Table 9-2. Groundwater Sampling Results for Well/Chemical Pairs Screened Out by Population Comparisons

Sample ID	Sample Date	Well ID	Result (mg/L)	Nondetect?
OW-05D-075	07/28/2005	OW-5D	0.151	
OW-05D-077	08/26/2005	OW-5D	0.241	
OW-5D-WQ6	05/11/2005	OW-5D	0.159	
Selenium				
OW-02D-003	09/14/2005	OW-2D	0.01	ND
OW-02D-004	10/20/2005	OW-2D	0.005	ND
OW-02D-005	11/14/2005	OW-2D	0.0056	
OW-02D-006	12/05/2005	OW-2D	0.0065	
OW-02D-007	03/14/2006	OW-2D	0.005	ND
OW-02D-008	06/07/2006	OW-2D	0.005	ND
OW-02D-009	08/31/2006	OW-2D	0.005	ND
OW-02D-010	10/10/2006	OW-2D	0.005	ND
OW-02D-012	04/30/2007	OW-2D	0.00208	
OW-02D-014	10/17/2007	OW-2D	0.00254	
OW-02D-075	07/28/2005	OW-2D	0.01	ND
OW-02D-077	08/25/2005	OW-2D	0.01	ND
OW-2D-WQ5	01/13/2005	OW-2D	0.0171	
OW-2D-WQ6	05/10/2005	OW-2D	0.001	ND
Vanadium				
CIS-021	05/03/2007	MW-11	0.007880001	
MW-11_07/01/1997	07/01/1997	MW-11	0.024	
MW-11_09/01/2000	09/01/2000	MW-11	0.0061	
MW-11_11/28/2001	11/28/2001	MW-11	0.0036	
MW-11-043	09/21/2004	MW-11	0.0058	
MW-11-049	12/17/2004	MW-11	0.0099	
MW-11-056	03/08/2005	MW-11	0.0859	
MW-11-070	06/16/2005	MW-11	0.00831	
MW-11-081	10/03/2005	MW-11	0.0063	
MW-11-087	12/12/2005	MW-11	0.0083	
MW-11-093	03/06/2006	MW-11	0.008940001	
MW-11-098	05/09/2006	MW-11	0.008759999	
MW-11-110	10/12/2006	MW-11	0.00871	
MW-25_06/15/1999	06/15/1999	MW-25	0.012	
MW-25_09/01/2000	09/01/2000	MW-25	0.0051	
MW-25_11/29/2001	11/29/2001	MW-25	0.0077	
MW-25-030	06/09/2004	MW-25	0.003	ND
MW-25-043	09/22/2004	MW-25	0.003	ND
MW-25-056	03/09/2005	MW-25	0.0733	
MW-25-070	06/14/2005	MW-25	0.0118	
MW-25-081	10/04/2005	MW-25	0.0066	
MW-25-087	12/14/2005	MW-25	0.0097	
MW-25-093	03/09/2006	MW-25	0.0118	
MW-25-098	05/03/2006	MW-25	0.012	
MW-25-110	10/03/2006	MW-25	0.0112	
MW-25-121	03/06/2007	MW-25	0.0111	
MW-34-080-056	03/08/2005	MW-34-80	0.238	

Table 9-2. Groundwater Sampling Results for Well/Chemical Pairs Screened Out by Population Comparisons

Sample ID	Sample Date	Well ID	Result (mg/L)	Nondetect?
MW-34-080-070	06/30/2005	MW-34-80	0.00274	
MW-34-080-081	10/05/2005	MW-34-80	0.005	ND
MW-34-080-087	12/14/2005	MW-34-80	0.0135	
MW-34-080-093	03/09/2006	MW-34-80	0.00294	
MW-34-080-098	05/03/2006	MW-34-80	0.00244	
MW-34-080-110	10/04/2006	MW-34-80	0.00234	
MW-34-080-115	12/12/2006	MW-34-80	0.0016	
MW-34-080-121	03/05/2007	MW-34-80	0.00161	
MW-34-080-125	04/30/2007	MW-34-80	0.00167	
MW-34-80-030	06/08/2004	MW-34-80	0.003	ND
MW-34-80-043	09/23/2004	MW-34-80	0.003	ND
MW-34-80-049	12/13/2004	MW-34-80	0.0153	
MW-37D-030	06/11/2004	MW-37D	0.003	ND
MW-37D-043	09/24/2004	MW-37D	0.003	ND
MW-37D-049	12/14/2004	MW-37D	0.0314	
MW-37D-056	03/11/2005	MW-37D	0.326	
MW-37D-070	06/15/2005	MW-37D	0.004	
MW-37D-081	10/04/2005	MW-37D	0.006	
MW-37D-087	12/14/2005	MW-37D	0.0145	
MW-37D-093	03/13/2006	MW-37D	0.00717	
MW-37D-098	05/03/2006	MW-37D	0.00625	
MW-37D-110	10/13/2006	MW-37D	0.00608	
MW-37D-115	12/14/2006	MW-37D	0.00614	
MW-37D-121	03/07/2007	MW-37D	0.00503	
MW-37D-125	05/03/2007	MW-37D	0.00501	
OW-01M-003	09/14/2005	OW-1M	0.0133	
OW-01M-004	10/19/2005	OW-1M	0.0521	
OW-01M-005	11/14/2005	OW-1M	0.0625	
OW-01M-006	12/05/2005	OW-1M	0.0054	
OW-01M-007	03/14/2006	OW-1M	0.0193	
OW-01M-008	06/06/2006	OW-1M	0.0121	
OW-01M-009	08/31/2006	OW-1M	0.005	ND
OW-01M-010	10/10/2006	OW-1M	0.005	ND
OW-01M-012	05/01/2007	OW-1M	0.00184	
OW-01M-014	10/16/2007	OW-1M	0.00309	
OW-01M-049	12/21/2004	OW-1M	0.0147	
OW-01M-075	07/27/2005	OW-1M	0.0147	
OW-01M-077	08/25/2005	OW-1M	0.0122	
OW-1M-WQ6	05/10/2005	OW-1M	0.00545	
OW-02D-003	09/14/2005	OW-2D	0.017	
OW-02D-004	10/20/2005	OW-2D	0.0862	
OW-02D-005	11/14/2005	OW-2D	0.052	
OW-02D-006	12/05/2005	OW-2D	0.005	ND
OW-02D-007	03/14/2006	OW-2D	0.0126	
OW-02D-008	06/07/2006	OW-2D	0.0118	
OW-02D-009	08/31/2006	OW-2D	0.005	ND

Table 9-2. Groundwater Sampling Results for Well/Chemical Pairs Screened Out by Population Comparisons

Sample ID	Sample Date	Well ID	Result (mg/L)	Nondetect?
OW-02D-010	10/10/2006	OW-2D	0.005	ND
OW-02D-012	04/30/2007	OW-2D	0.00148	
OW-02D-014	10/17/2007	OW-2D	0.00181	
OW-02D-075	07/28/2005	OW-2D	0.0172	
OW-02D-077	08/25/2005	OW-2D	0.0152	
OW-2D-WQ5	01/13/2005	OW-2D	0.0177	
OW-2D-WQ6	05/10/2005	OW-2D	0.001	ND
OW-02M-003	09/14/2005	OW-2M	0.0124	
OW-02M-004	10/20/2005	OW-2M	0.0913	
OW-02M-005	11/15/2005	OW-2M	0.0518	
OW-02M-006	12/06/2005	OW-2M	0.0069	
OW-02M-007	03/14/2006	OW-2M	0.0158	
OW-02M-008	06/07/2006	OW-2M	0.011	
OW-02M-009	08/30/2006	OW-2M	0.005	ND
OW-02M-010	10/10/2006	OW-2M	0.005	ND
OW-02M-012	04/30/2007	OW-2M	0.0021	
OW-02M-014	10/16/2007	OW-2M	0.00238	
OW-02M-075	07/28/2005	OW-2M	0.0144	
OW-02M-077	08/25/2005	OW-2M	0.0114	
OW-2M-WQ6	05/11/2005	OW-2M	0.00296	
Zinc				
MW-12_02/17/1998	02/17/1998	MW-12	0.016	
MW-12_03/25/2000	03/25/2000	MW-12	0.019	
MW-12_03/28/2001	03/28/2001	MW-12	0.016	
MW-12_06/06/2001	06/06/2001	MW-12	0.016	
MW-12_06/15/1998	06/15/1998	MW-12	0.011	
MW-12_06/15/1999	06/15/1999	MW-12	0.0046	
MW-12_06/15/2000	06/15/2000	MW-12	0.018	
MW-12_07/01/1997	07/01/1997	MW-12	0.017	
MW-12_09/01/1997	09/01/1997	MW-12	0.034	
MW-12_09/01/2000	09/01/2000	MW-12	0.01	
MW-12_09/12/2001	09/12/2001	MW-12	0.025	
MW-12_09/14/1999	09/14/1999	MW-12	0.0096	
MW-12_11/29/2001	11/29/2001	MW-12	0.071	
MW-12_12/01/1999	12/01/1999	MW-12	0.0077	
MW-12_12/01/2000	12/01/2000	MW-12	0.017	
MW-12_12/11/02_LS	12/11/2002	MW-12	0.06939999	
MW-12-001_03/07/2002	03/07/2002	MW-12	0.0688	
MW-12-003	09/16/2005	MW-12	0.0755	
MW-12-0032002	09/18/2002	MW-12	0.0845	
MW-12-005	03/20/2003	MW-12	0.54	
MW-12-006	06/11/2003	MW-12	0.121	
MW-12-007	09/09/2003	MW-12	0.0261	ND
MW-12-009	12/10/2003	MW-12	0.02	ND
MW-12-018	03/16/2004	MW-12	0.0948	
MW-12-030	06/09/2004	MW-12	0.01	

Table 9-2. Groundwater Sampling Results for Well/Chemical Pairs Screened Out by Population Comparisons

Sample ID	Sample Date	Well ID	Result (mg/L)	Nondetect?
MW-12-043	09/20/2004	MW-12	0.0192	
MW-12-056	03/10/2005	MW-12	0.0546	
MW-12-070	06/13/2005	MW-12	0.0244	
MW-12-081	10/04/2005	MW-12	0.02	ND
MW-12-087	12/13/2005	MW-12	0.02	ND
MW-12-093	04/18/2006	MW-12	0.01	ND
MW-12-098	05/01/2006	MW-12	0.01	ND
MW-12-110	10/04/2006	MW-12	0.01	ND
MW-12-115	12/13/2006	MW-12	0.0224	
MW-12-121	03/06/2007	MW-12	0.01	ND
MW-12-125	05/03/2007	MW-12	0.01	ND
MW-12-136	10/04/2007	MW-12	0.01	ND
MW-12-138	12/13/2007	MW-12	0.02	ND
MW-12-141	03/10/2008	MW-12	0.0221	
MW-12-143	05/05/2008	MW-12	0.0344	
MW-40-002_6/13/02	06/13/2002	MW-12	0.033	
MW-34-055-056	03/10/2005	MW-34-55	0.0877	
MW-34-055-081	10/05/2005	MW-34-55	0.0227	
MW-34-055-087	12/14/2005	MW-34-55	0.02	ND
MW-34-055-093	03/08/2006	MW-34-55	0.01	ND
MW-34-055-098	05/03/2006	MW-34-55	0.0141	
MW-34-055-110	10/04/2006	MW-34-55	0.01	ND
MW-34-55-006-AT	06/16/2003	MW-34-55	0.0744	
MW-34-55-006-BT	06/17/2003	MW-34-55	0.163	
MW-34-55-007	09/10/2003	MW-34-55	0.0349	
MW-34-55-009	12/12/2003	MW-34-55	0.0378	
MW-34-55-018	03/17/2004	MW-34-55	0.0831	ND
MW-34-55-030	06/08/2004	MW-34-55	0.01	ND
MW-34-55-043	09/22/2004	MW-34-55	0.0227	
MW-34-55-049	12/15/2004	MW-34-55	0.0251	
MW-34/80-009	12/11/2003	MW-34-80	0.0348	
MW-34-080-056	03/08/2005	MW-34-80	0.0417	
MW-34-080-070	06/30/2005	MW-34-80	0.037	
MW-34-080-081	10/05/2005	MW-34-80	0.02	ND
MW-34-080-087	12/14/2005	MW-34-80	0.02	ND
MW-34-080-093	03/09/2006	MW-34-80	0.01	ND
MW-34-080-098	05/03/2006	MW-34-80	0.031	
MW-34-080-110	10/04/2006	MW-34-80	0.01	ND
MW-34-080-115	12/12/2006	MW-34-80	0.01	ND
MW-34-080-121	03/05/2007	MW-34-80	0.01	ND
MW-34-080-125	04/30/2007	MW-34-80	0.01	ND
MW-34-80-006-AT	06/16/2003	MW-34-80	0.0692	
MW-34-80-006-BT	06/17/2003	MW-34-80	0.0854	
MW-34-80-007	09/10/2003	MW-34-80	0.0792	
MW-34-80-018	03/17/2004	MW-34-80	0.0755	ND
MW-34-80-030	06/08/2004	MW-34-80	0.01	ND

Table 9-2. Groundwater Sampling Results for Well/Chemical Pairs Screened Out by Population Comparisons

Sample ID	Sample Date	Well ID	Result (mg/L)	Nondetect?
MW-34-80-043	09/23/2004	MW-34-80	0.0232	
MW-34-80-049	12/13/2004	MW-34-80	0.0297	
MW-37D-030	06/11/2004	MW-37D	0.01	ND
MW-37D-043	09/24/2004	MW-37D	0.0248	
MW-37D-049	12/14/2004	MW-37D	0.0918	
MW-37D-056	03/11/2005	MW-37D	0.0387	
MW-37D-070	06/15/2005	MW-37D	0.011	
MW-37D-081	10/04/2005	MW-37D	0.02	ND
MW-37D-087	12/14/2005	MW-37D	0.02	ND
MW-37D-093	03/13/2006	MW-37D	0.01	ND
MW-37D-098	05/03/2006	MW-37D	0.01	ND
MW-37D-110	10/13/2006	MW-37D	0.01	ND
MW-37D-115	12/14/2006	MW-37D	0.0266	
MW-37D-121	03/07/2007	MW-37D	0.01	ND
MW-37D-125	05/03/2007	MW-37D	0.01	ND
OW-05M-003	09/13/2005	OW-5M	0.0264	
OW-05M-004	10/20/2005	OW-5M	0.02	ND
OW-05M-005	11/15/2005	OW-5M	0.025	
OW-05M-006	12/06/2005	OW-5M	0.0238	
OW-05M-007	03/15/2006	OW-5M	0.02	ND
OW-05M-008	06/07/2006	OW-5M	0.02	ND
OW-05M-009	08/30/2006	OW-5M	0.02	ND
OW-05M-010	10/11/2006	OW-5M	0.02	ND
OW-05M-012	04/30/2007	OW-5M	0.01	ND
OW-05M-014	10/17/2007	OW-5M	0.278	
OW-05M-075	07/28/2005	OW-5M	0.0122	ND
OW-05M-077	08/26/2005	OW-5M	0.0156	ND
OW-5M-WQ5	01/13/2005	OW-5M	0.0373	
OW-5M-WQ6	05/11/2005	OW-5M	0.01	ND

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

mg/L = milligram(s) per liter

Table 9-3. Groundwater Samples where Analytical Detection Limits Exceed Maximum Detected Concentration and Background UTL

Constituent of Potential Concern	Total Number of Wells Sampled	Number of Wells Meeting Criteria 1	Percent of Wells Meeting Criteria 1	Wells Meeting Both Criteria 1 and 2	Percent of Wells Meeting Both Criteria 1 and 2
Aluminum	64	0	0.0%	0	0.0%
Antimony	68	0	0.0%	0	0.0%
Arsenic	110	1	0.9%	1	0.9%
Barium	107	40	37.4%	0	0.0%
Beryllium	68	0	0.0%	0	0.0%
Chromium, hexavalent	167	0	0.0%	0	0.0%
Chromium, total	167	4	2.4%	0	0.0%
Cobalt	68	0	0.0%	0	0.0%
Copper	86	2	2.3%	0	0.0%
Fluoride	104	3	2.9%	3	2.9%
Lead	83	1	1.2%	0	0.0%
Molybdenum	83	4	4.8%	0	0.0%
Nickel	86	17	19.8%	0	0.0%
Nitrate as nitrogen	165	0	0.0%	0	0.0%
Selenium	76	0	0.0%	0	0.0%
Silver	68	0	0.0%	0	0.0%
Thallium	68	0	0.0%	0	0.0%
Vanadium	83	0	0.0%	0	0.0%
Zinc	86	0	0.0%	0	0.0%

Notes:

(1) Criteria 1: Well has a detection limit above the background UTL and the maximum detection is below the UTL (ND>UTL>max).

(2) Criteria 2: Well has a detection limit above the risk-based concentration (ND>RBC).

UTL = upper tolerance limit

Table 9-4. Comparison of Floodplain Groundwater Concentrations to Analytical Detection Limits and Surface Water Criteria

Constituent of Potential Concern	Maximum Detection Limit (mg/L)	Surface Water Screening Criteria (mg/L)	Maximum Detection (mg/L)	Potential Issue?
Aluminum	5.0E-01	1.0E+00	1.4E-01	No
Beryllium	1.2E-02	6.6E-04	1.1E-03	No
Mercury	5.0E-04	5.0E-05	4.0E-04	No
Silver	5.0E-02	3.6E-04	4.0E-02	No

Notes:

mg/L = milligram(s) per liter

Table 9-5. Comparison of Surface Water Concentrations to Analytical Detection Limits and Surface Water Criteria

Constituent of Potential Concern	Maximum Detection Limit (mg/L)	Surface Water Screening Criteria (mg/L)	Maximum Detection (mg/L)	Potential Issue?
Chromium, hexavalent	0.01	0.011	0.0004	No
Vanadium	0.01	0.02	0.253	No

Notes:

mg/L = milligram(s) per liter

Table 9-6. Comparison of Detection Limits to Maximum Detected Concentrations and to RBCs

Constituent of Potential Concern	Total Number of Samples	Total Number of Non-detects	Number of Wells where the Max Detection is the EPC	Number of Wells with a Detection Limit Higher than the Max Detection and the RBC
Aluminum	294	273	16	0
Antimony	384	375	8	0
Arsenic	460	270	2	0
Barium	559	198	9	0
Beryllium	374	354	14	0
Cadmium	374	373	1	0
Chromium, total	2,881	993	0	0
Cobalt	374	361	7	3
Copper	1,049	691	15	0
Fluoride	491	65	75	5
Chromium, hexavalent	2,780	1,130	24	0
Lead	474	412	35	1
Mercury	380	379	1	0
Molybdenum	563	35	22	0
Nickel	1,049	570	9	0
Nitrate as nitrogen	844	271	94	1
Selenium	396	228	12	0
Silver	374	366	7	0
Thallium	374	372	2	2
Vanadium	462	90	11	0
Zinc	1,049	324	10	0

Notes:

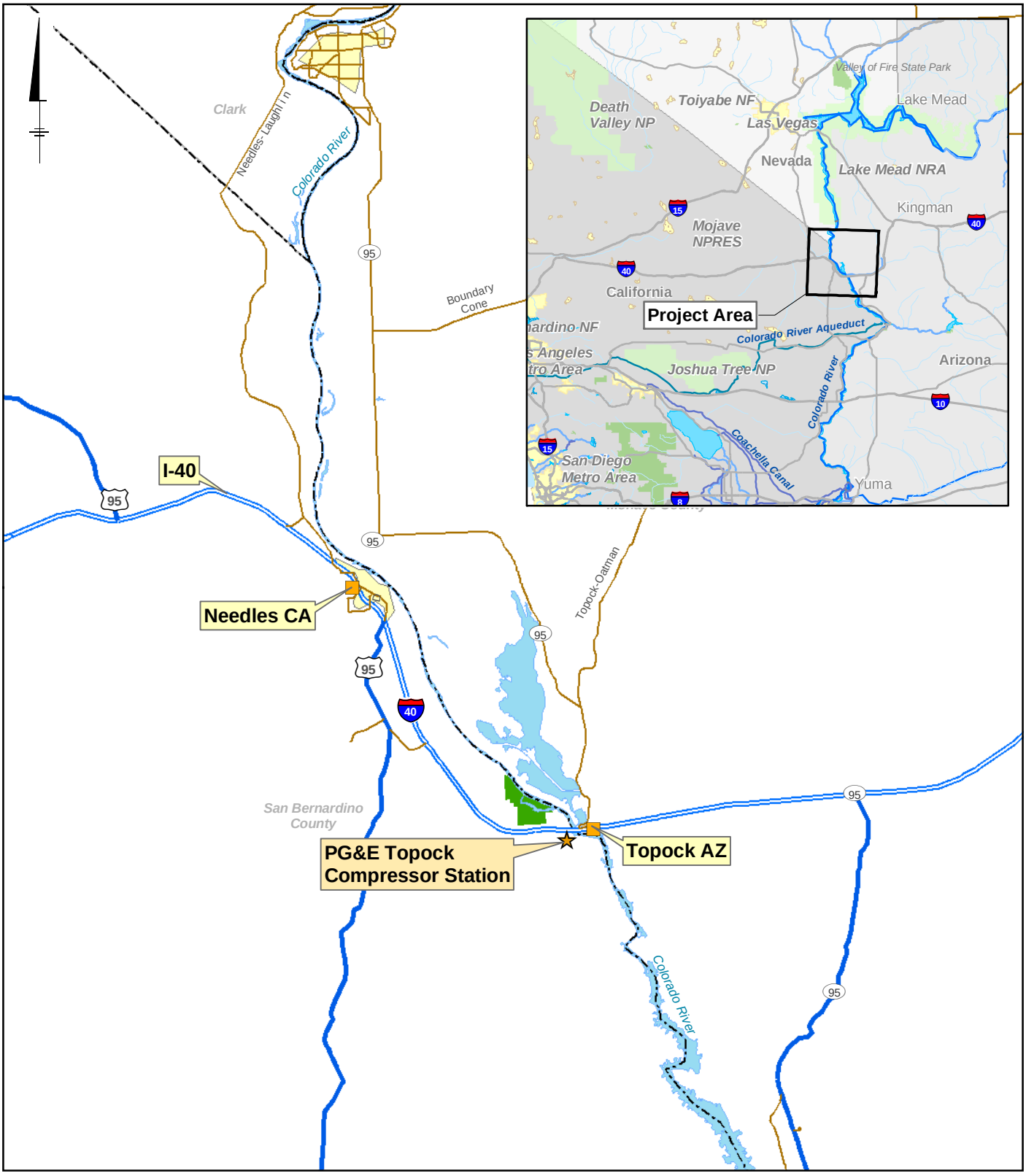
(1) EPCs are the 95% UCL OTM, as calculated by ProUCL, if there are at least eight results including at least five detections; otherwise, the EPC is the maximum detected concentration.

(2) See Appendix Q for calculations of RBCs.

EPC = exposure point concentration
OTM = of the mean
RBC = risk-based concentration
UCL = upper confidence limit

ARCADIS

Figures



0 5 10 Miles

GRAPHIC SCALE

NOTES:

Map Source: CH2M HILL (2005-2008)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

SITE LOCATION MAP

ARCADIS

FIGURE 1-1

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
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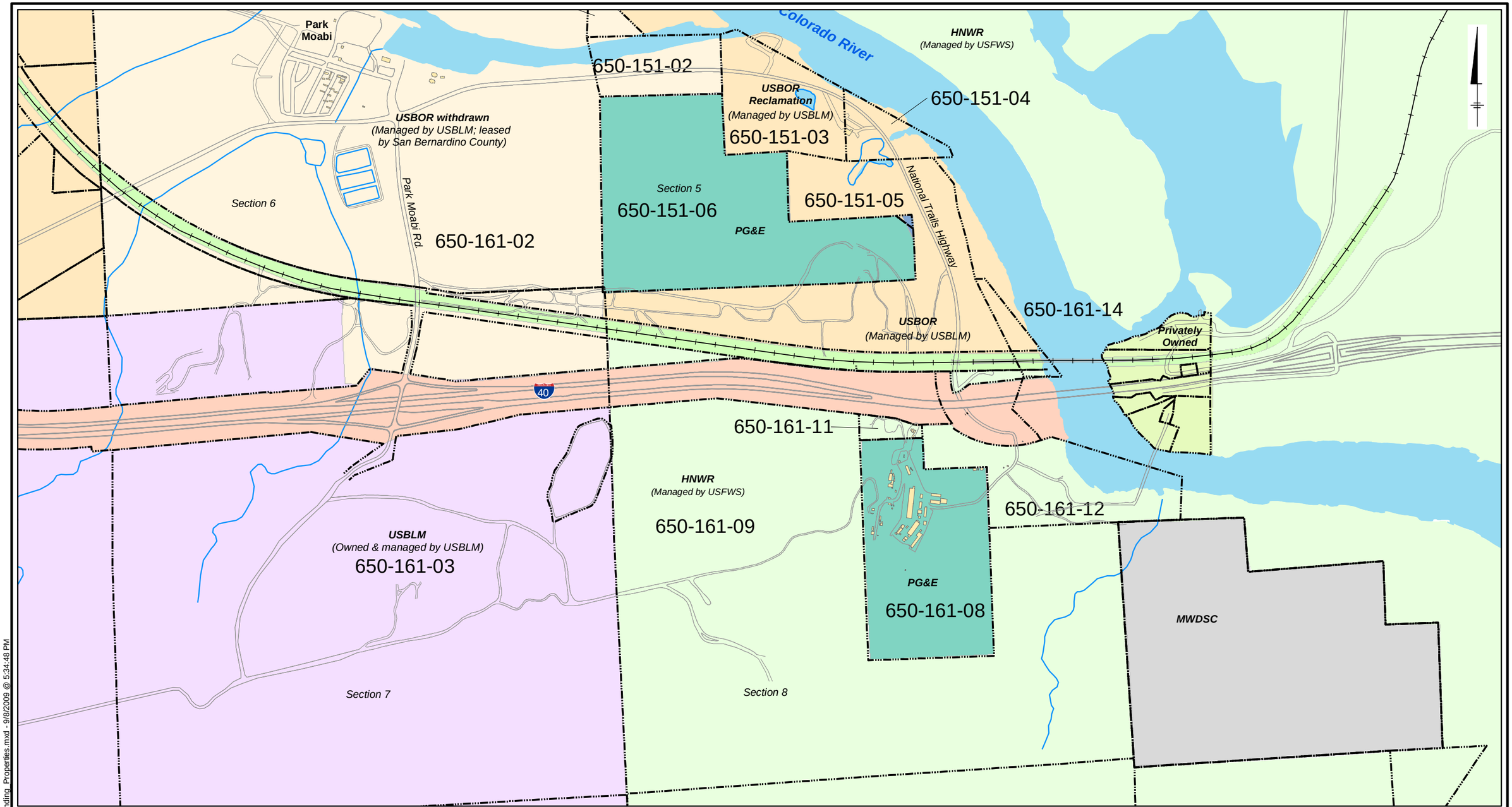


LEGEND:

Owner

- Burlington Northern Santa Fe Railroad (BNSF)
- Owned and Managed by U.S. Bureau of Land Management (USBLM)
- U.S. Bureau of Reclamation (USBLM)
- Caltrans Leased From Underlying Federal Owner
- Havasu National Wildlife Refuge (HNWR)
- Metropolitan Water District of Southern California (MWDSC)
- Pacific Gas and Electric Company (PG&E)
- Privately Owned
- San Bernardino County (SBC)
- State of California

- Property Boundary
- Highway
- Paved Road
- Dirt or Gravel Road
- Stream
- Building

0 1,000 2,000 Feet

GRAPHIC SCALE

NOTES:

1. The boundary lines shown are approximate and for reference only.
2. Source: San Bernadino County Assessor, Parcel quest, State Board of Equalization, Pacific Gas and Electric Company, Ecology and Environment and Plat maps provided by USBLM.
3. Map Source: CH2M HILL (2005-2008)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

SURROUNDING PROPERTIES

ARCADIS

FIGURE
1-2

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGETopock\GW_Risk\MXD\Fig_1-2_Surrounding_Properties.mxd - 9/8/2009 @ 5:34:48 PM

PARK MOABI

Sewage Disposal Ponds

Park Moabi rd.

Water Tank

GROUNDWATER TREATMENT FACILITY

National Trails Highway

66

Colorado River

MW-20 BENCH

TOPOCK MARINA

BNSF RAILROAD

Topock, AZ

INTERSTATE 40

NEW EVAPORATION PONDS

TOPOCK COMPRESSOR STATION

FORMER EVAPORATION POND SITE

FORMER GRAVEL QUARRY

LEGEND:

- Area of Potential Effect (APE)
- MW-20 Bench
- Groundwater Monitoring Well
- Test Well or Supply Well
- Injection Well
- Extraction Well
- California-Arizona Border
- Overhead Electric
- Gas Transmission Pipeline
- Potable Water Pipeline
- Underground Wastewater Pipeline
- IM-3 Effluent Pipeline
- IM-3 Multi-Utility Trench

0 1,000 2,000 Feet

GRAPHIC SCALE

NOTE:

1. The locations of pipelines and existing infrastructure are approximate. This figure is not intended to be a comprehensive depiction of all existing infrastructure in the area of potential effect (APE).

2. Map source: CH2M HILL (2005-2008)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

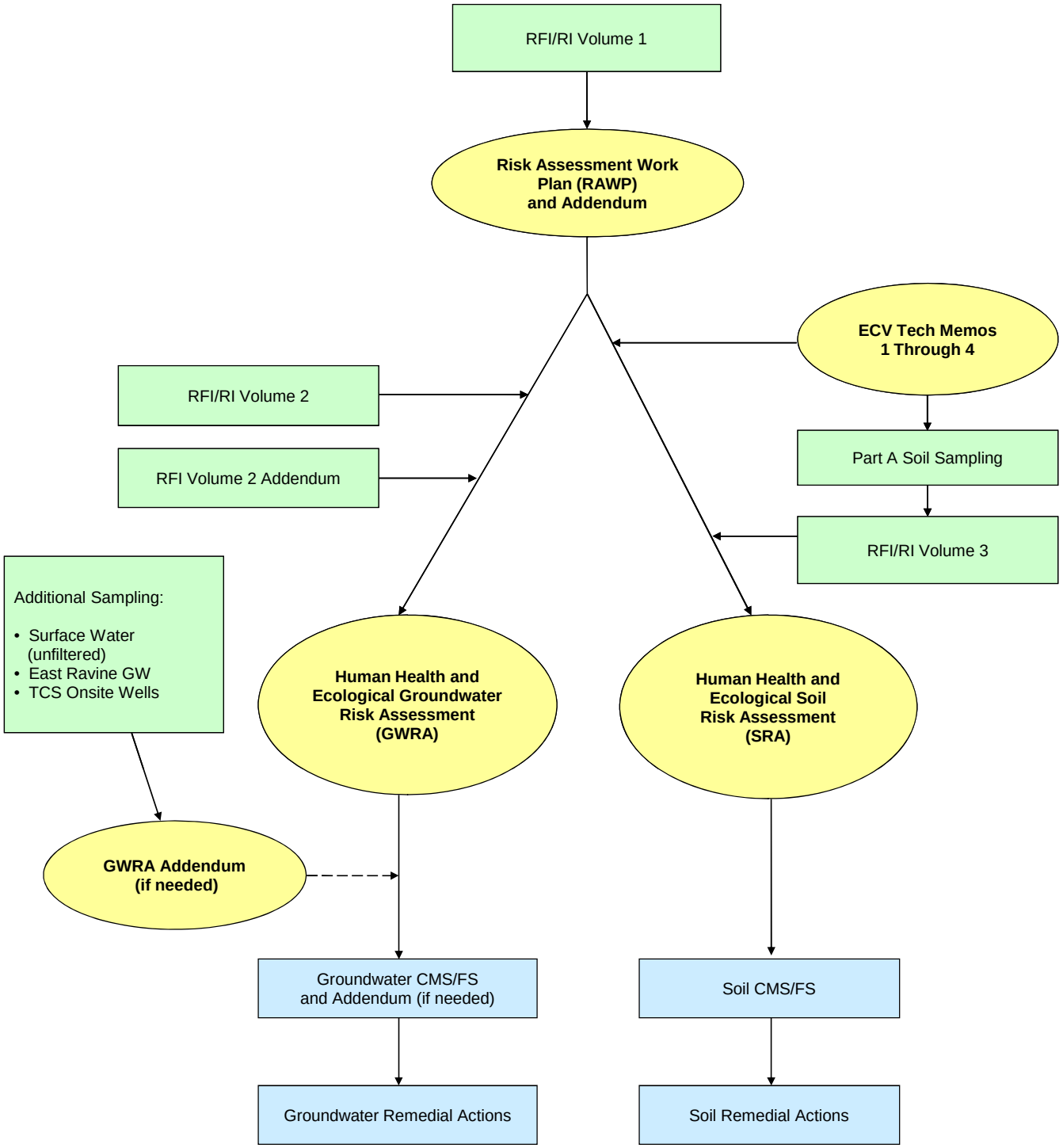
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

NEARBY COMMUNITIES AND DEVELOPMENT

ARCADIS

FIGURE 1-3

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGE\Topock\GW_Risk\MXD\Fig_1-3_Nearby_Communities.mxd - 9/8/2009 @ 5:36:04 PM



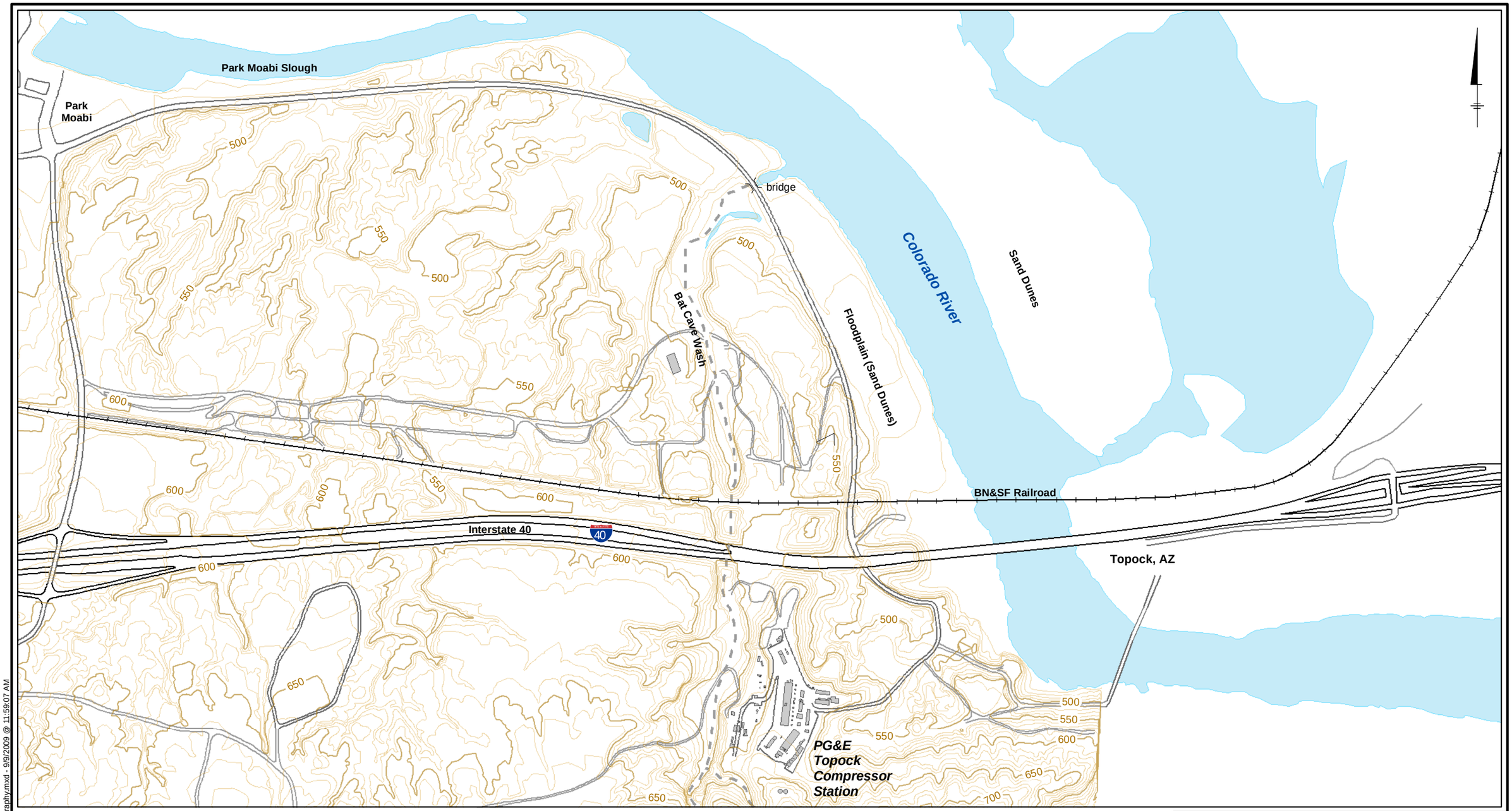
Abbreviations:
CMS/FS – Corrective Measures Study/ Feasibility Study
ECV – Ecological Comparison Values
GW – Groundwater
RFI/RI – RCRA Facility Investigation/ Remedial investigation
TCS – Topock Compressor Station

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

OVERVIEW OF RISK ASSESSMENT IN THE TOPOCK REGULATORY PROCESS

ARCADIS

FIGURE 1-4



NOTES:

1. Source: Topographic data from E&E (1994) with additional aerial topographic mapping flown April 2004 (CH2M HILL).

2. California State Plane, NAD 83, Zone 5, US Feet
Contour interval is 10 feet, with indices at 50 feet.

3. Map Source: CH2M HILL (2005-2008)

0 700 1,400 Feet

GRAPHIC SCALE

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

SITE TOPOGRAPHY

ARCADIS

FIGURE
2-1

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
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TOPOCK MARSH

COLORADO RIVER

PARK MOABI

BNSF RAILROAD

BAT CAVE WASH

TOPOCK, AZ

Needles Graben (Quaternary-age fault structure) located approximately 6 miles north of study area

El Paso Natural Gas Mojave Topock Compressor Station

Chemehuevi Fault (concealed)

Chemehuevi Fault

PG&E TOPOCK COMPRESSOR STATION

Mohave Wash Fault

Tb

Qa

Qrf

Qrg

Tmc

Toa

pTbr

LEGEND

- Qrf = Quaternary Colorado River and recent Floodplain Deposits
- Qrg = Quaternary River Gravels
- Qa = Quaternary Alluvium and surficial deposits, undifferentiated
- Tb = Bouse Formation
- Toa = Tertiary Alluvium (Fanglomerate of Metzer and Loeltz)
- Tmc = Miocene Conglomerate (Bedrock)
- pTbr = Pre-Tertiary Bedrock (Metadiorite, Gneiss, Granitic Rocks)

- Normal Fault ball on downthrown side
- Detachment Fault barbs on downthrown side
- Detachment Fault concealed

0 2,000 4,000 Feet

GRAPHIC SCALE

NOTES:

1. Generalized surface geologic map compiled from Metzger and Loeltz (1973), John (1987), Howard et al. (1997) and PG&E technical reports.

2. Map Source: CH2M HILL (2005-2008)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

SITE GEOLOGIC FEATURES

ARCADIS

FIGURE 2-2

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGETopock\GW_Risk\MXD\Fig_2-2_Geology.mxd - 9/9/2009 @ 12:01:33 PM

LEGEND

Fluvial Deposits of Colorado River } Alluvial Aquifer
Older Alluvial Fan Deposits

Natural reducing zone in fluvial deposits (estimated beneath river and marsh)

Groundwater flow direction

Bedrock (Conglomerate and Igneous/Metamorphic Rocks)

Hexavalent chromium concentrations in groundwater, micrograms per liter (µg)/L

50 to 1,000 µg/L

1,000 to 5,000 µg/L

greater than 5,000 µg/L

CALIFORNIA

ARIZONA

N

Park Moabi

Slough

Park Moabi Road

Colorado River

Sand Dune Floodplain

Topock Marsh

IM Injection Wells

BN&SF Railroad

IM Groundwater Treatment Plant

Wash

Bat Cave

Floodplain

IM Extraction Wells

40

Compressor Station Evaporation Ponds

Elevation (feet MSL)

800

600

400

200

0

Chemehuevi Mountains

Bedrock

2,000 ft.

1,000 ft.

0

Location of former percolation bed in Bat Cave Wash

alluv al fan deposits

Alluvial Aquifer

Bedrock

300 ft.

Approximate location of PG&E Topock Compressor Station at surface elevation 600 ft.

Alluvial Aquifer

fluvial deposits

alluvial fan deposits

Bedrock

fluvial deposits

alluvial fan deposits

Alluvial Aquifer

400

200

0

SOURCE: CH2M HILL (2005-2008)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

SITE HYDROGEOLOGIC FEATURES

ARCADIS

FIGURE
2-3

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
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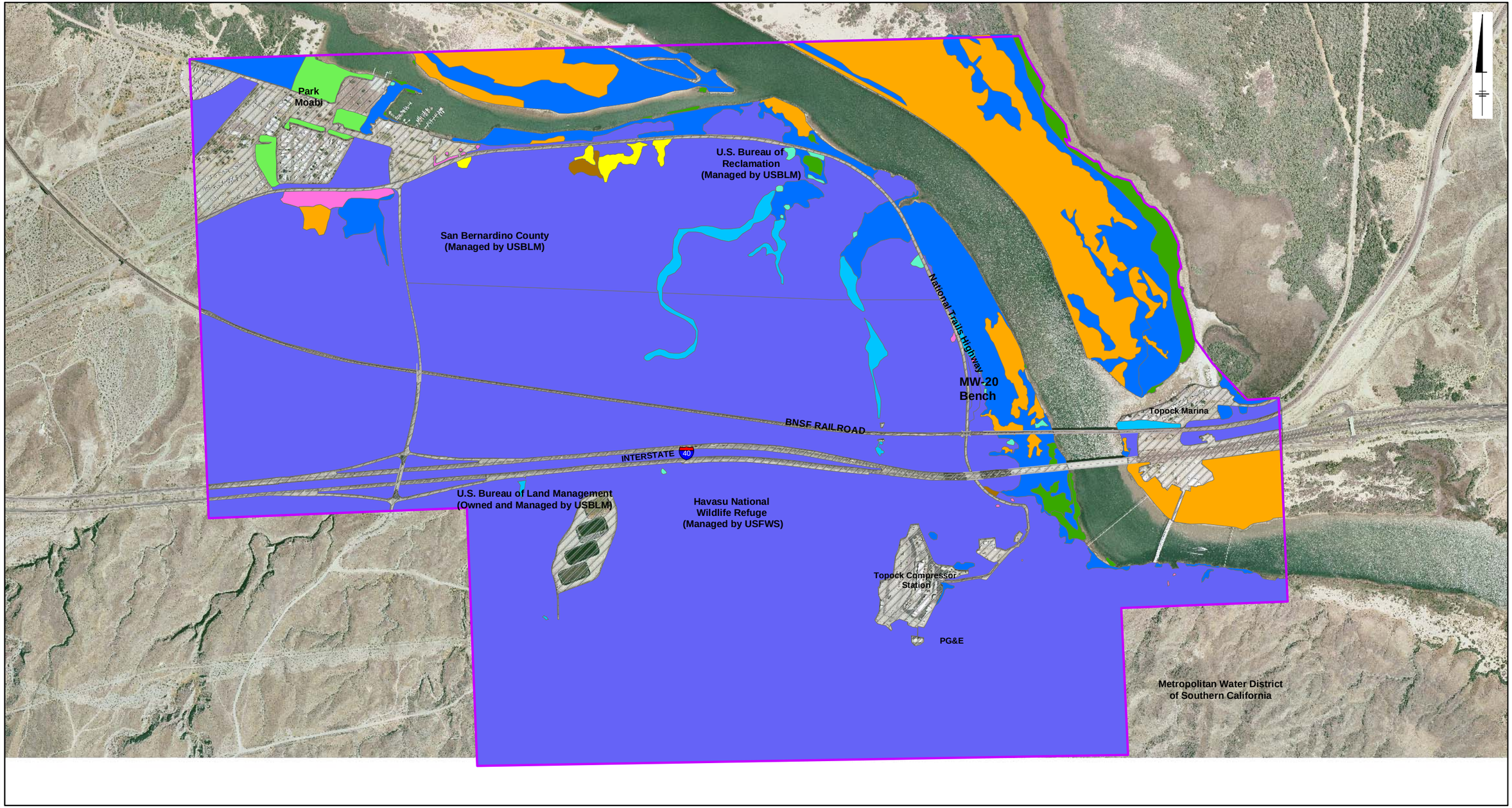

LEGEND:

- Arrow Weed
- Creosote Bush Scrub
- Landscaped
- Mesquite
- Mesquite/Palo Verde
- Palo Verde
- Salt Bush
- Salt Cedar
- Salt Cedar/Mesquite
- Wetland/Marsh
- Area of Potential Effects
- Developed

0 1,000 2,000 Feet

GRAPHIC SCALE

NOTE:

Map Source: CH2M HILL (2005-2008)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

VEGETATION COMMUNITIES

ARCADIS

FIGURE 2-4

[WC-85 VJR] SANF-85 EGH
Project (RC000689.0002 Task 2)
Q:\PGE\Topock\GW_Risk\MXD\Fig_2-4_Vegetation_Communities.mxd - 10/5/2009 @ 9:37:05 AM

U.S. Bureau of Reclamation
(Managed by USBLM)

Havasu National Wildlife Refuge
(Managed by USFWS)

Property of the
State of California

Park Moabi Rd

Colorado River

San Bernardino County
(Managed by USBLM)

PG&E

BAT CAVE WASH

U.S. Bureau of Reclamation
(Managed by USBLM)

BN&SF Railroad

INTERSTATE 40

NEW
EVAPORATION
PONDS

Privately
Owned

Havasu National Wildlife Refuge
(Managed by USFWS)

TOPOCK
COMPRESSOR
STATION

U.S. Bureau of Land Management
(Owned and Managed by USBLM)

PG&E

Metropolitan
Water District of
Southern California

LEGEND:

- Paved Road
- Highway
- Ravine
- Railroad
- AOC/SWMU Area
- Colorado River
- Property Boundary
- Industrial Use
- Recreational, Tribal, and Pipeline Maintenance Uses
- Recreational, Tribal, Pipeline Maintenance, and Unrestricted Uses

0 700 1,400 Feet

GRAPHIC SCALE

NOTES:

Map Source: CH2M HILL (2005-2008)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ANTICIPATED FUTURE LAND USE

ARCADIS

FIGURE
2-5

[WC-85 VJR] SANF-85 EGH
Project (RC000689.0002 Task 2)
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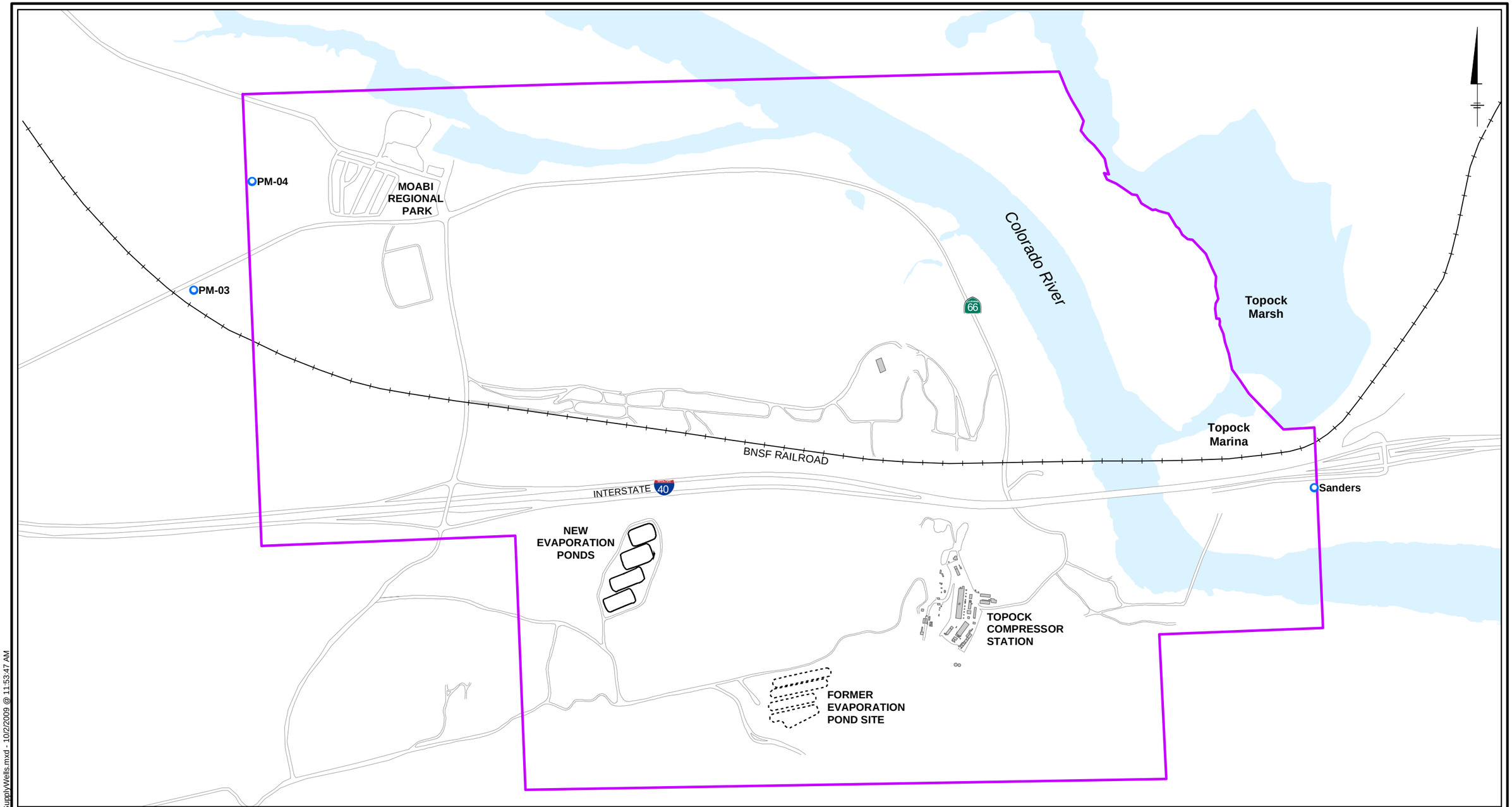

LEGEND:

- Supply Well
- Area of Potential Effects

NOTE:
Map Source: CH2M HILL (2005-2008)

0 1,000 2,000 Feet
GRAPHIC SCALE

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

KNOWN ACTIVE SUPPLY WELLS IN THE APE

ARCADIS

FIGURE
2-6

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
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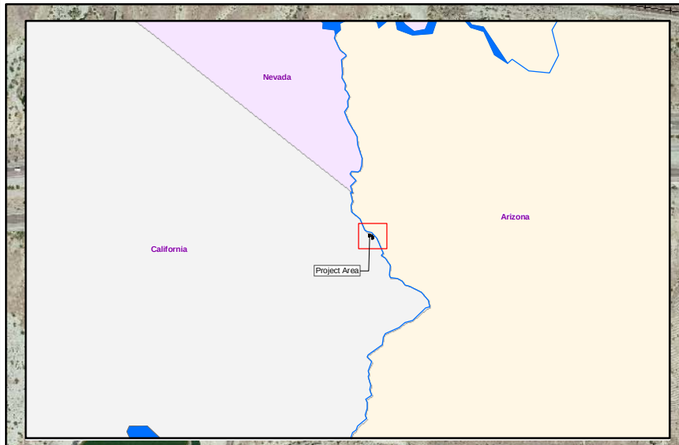


U.S. Bureau of Reclamation
(Managed by USBLM)

AOC 14
Railroad Debris
Site

Havasu National Wildlife Refuge
(Managed by USFWS)

AOC 1

SWMU 1
(Unit 4.1)
Former
Percolation Bed

SWMU 2
(Unit 4.2)
Inactive
Injection Well
PGE-08

11a
11b
11c
AOC11
Topographic
Low Areas
AOC6
Cooling
Tower B
11e
11d
AOC12
(F2)
Fill Area
12a
12b
12c
AOC 19
Former Cooling
Liquid Mixing Area
10d
AOC 16
Sand Blast
Shelter
AOC 15
Auxiliary
Jacket Water
Cooling Pumps
10c
10b
AOC10
East Ravine
AOC 17
On-Site Septic System
10a
AOC5
Cooling
Tower A
AOC9
Southeast
Fence Line
AOC4
Debris Ravine
AOC7
Hazardous
Materials
Storage Area
AOC8
Paint Locker
PG&E
Potential Pipe
Disposal Area
Metropolitan Water District
of Souther California

LEGEND:

- Solid Waste Management Unit (SWMU)
- Area of Concern (AOC)
- Other Undesignated Areas
- Location of Ephemeral Washes

NOTES:
1. AOC 13 is not depicted on this figure. It consists of the unpaved areas within the compressor station.

2. AOC 20 is not depicted on this figure. It consists of industrial floor drains within the compressor station.

3. Boundaries of all SWMUs, AOCs, and Other Undesignated Areas are approximate.

4. Map Source: CH2M HILL (2005-2008)

0 400 800 Feet
GRAPHIC SCALE

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

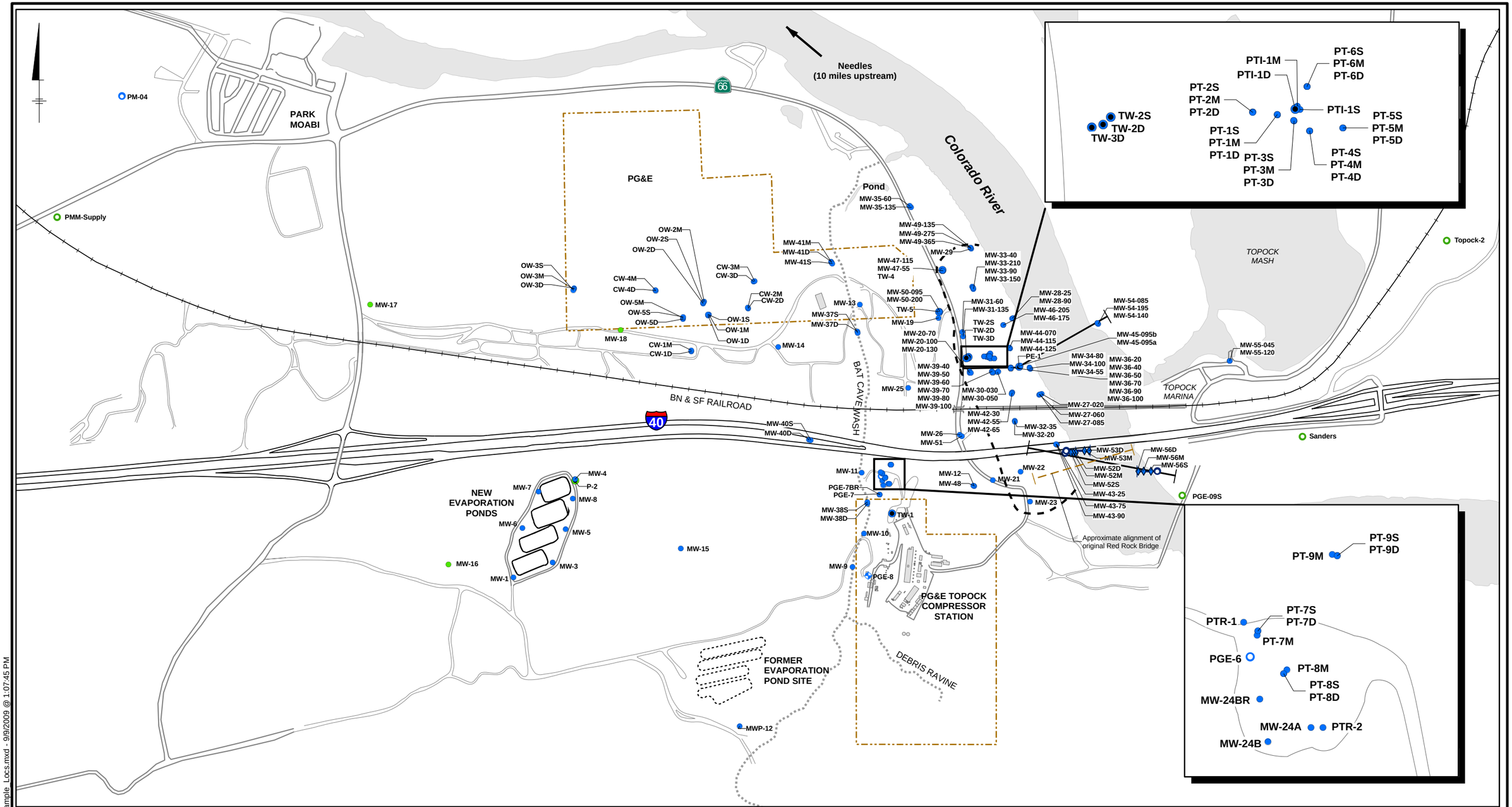
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

SWMUs, AOCs, AND OTHER UNDESIGNATED AREAS TO BE ADDRESSED IN RFI/RI

ARCADIS

FIGURE
2-7

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGETopock\GW_Risk\MXD\Fig_2-7_SWMUs_AOCs.mxd - 9/9/2009 @ 1:02:05 PM



LEGEND:

Sampling Location Types-Background Well Locations

- Water Supply Well
- Injection Well
- Groundwater Monitoring Well or Cluster
- Test or Extraction Well

Sampling Location Types-Site Well Locations

- Water Supply Well
- Injection Well
- Groundwater Monitoring Well or Cluster
- Test or Extraction Well

- Lateral Projection of Angle Well
  - Total depth of borehole
  - Sample point
  - Borehole location at surface
- H — H' Hydrogeologic Cross-Section (included in Volume 2 Addendum)
- Floodplain Zone
- PG&E Parcels

0 900 1,800 Feet

GRAPHIC SCALE

NOTE:

Map Source: CH2M HILL (2005-2008)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

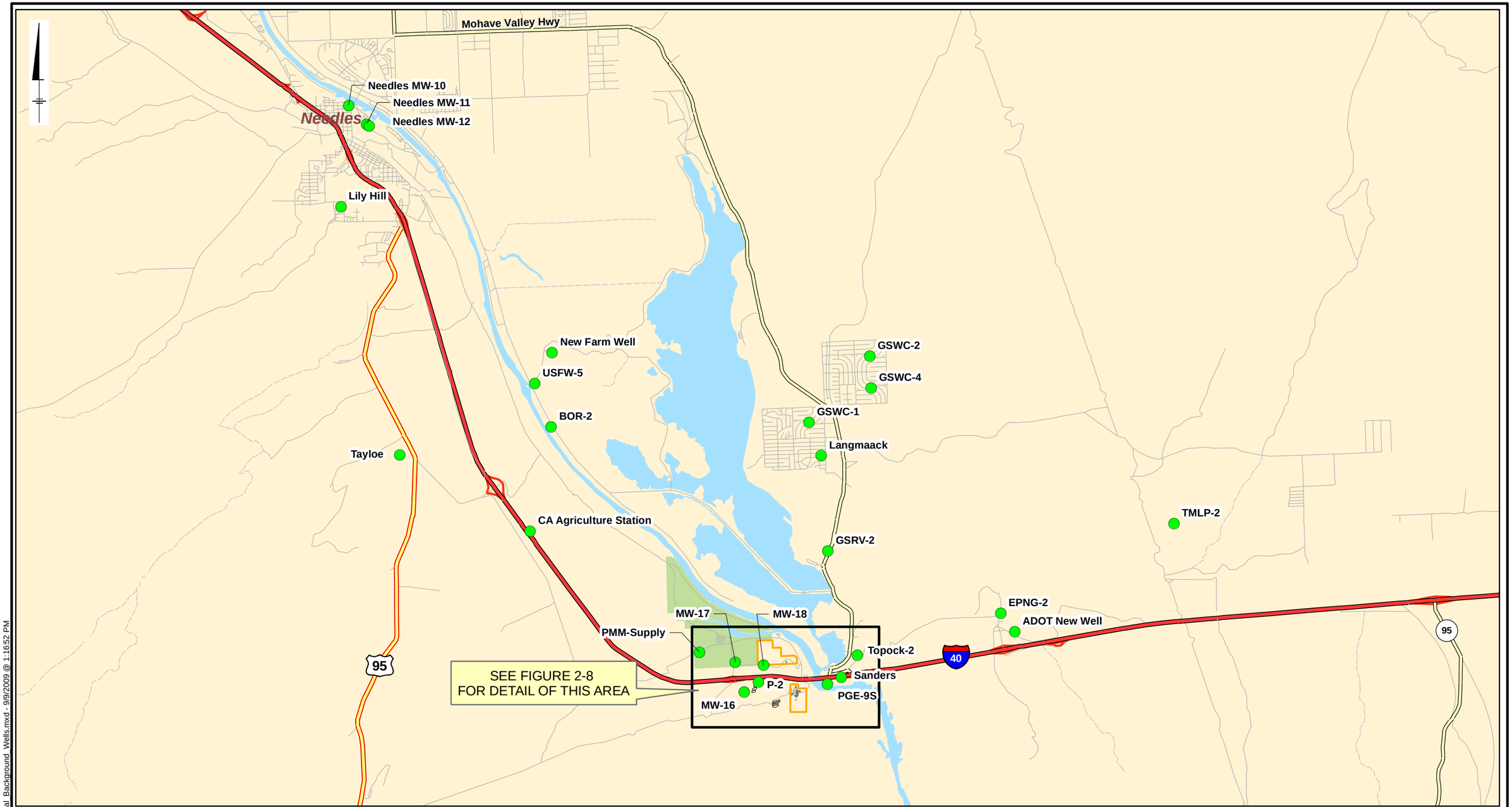
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

GROUNDWATER SAMPLING LOCATIONS FOR RISK ASSESSMENT CHARACTERIZATION

ARCADIS

FIGURE 2-8

[WC-85 VJR] SANF-85 EGH
Project (RC000689.0002 Task 2)
Q:\PGE\Topock\GW_Risk\MXD\Fig_2-8_GW_Sample_Locs.mxd - 9/9/2009 @ 1:07:45 PM



LEGEND

Background Monitoring Well Locations

0 1.5 3 Miles

GRAPHIC SCALE

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

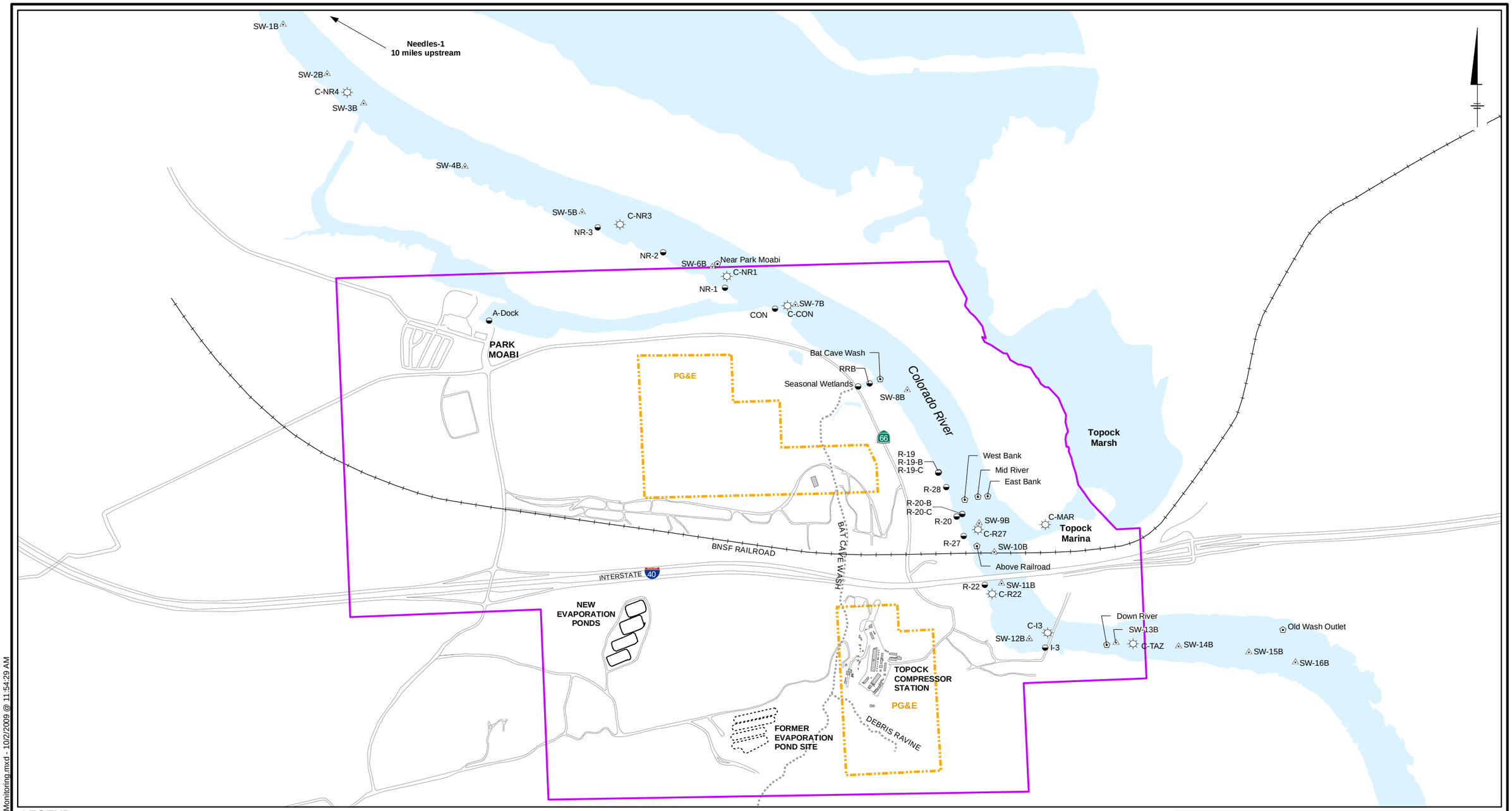
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

BACKGROUND GROUNDWATER SAMPLING LOCATIONS FOR RFI/RI CHARACTERIZATION

ARCADIS

FIGURE
2-9

[WC-85 VJR] SANF-85 EGH
Project (RC000689.0002 Task 2)
Q:\PGE\Topock\GW_Risk\MXD\Fig_2-9_Regional_Background_Wells.mxd - 9/9/2009 @ 1:16:52 PM



LEGEND:

Surface Water Sample Locations: July 1997 - October 2007

- Shoreline Surface Water Sampling Locations
- Pore Water Study Surface Water Sampling Location
- River Channel Surface Water Sampling Location
- Chromium VI Sample Locations (Metropolitan Water District of Southern California)
- Area of Potential Effects

NOTE:
Map Source: CH2M HILL (2005-2008)

0 1,000 2,000 Feet
GRAPHIC SCALE

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

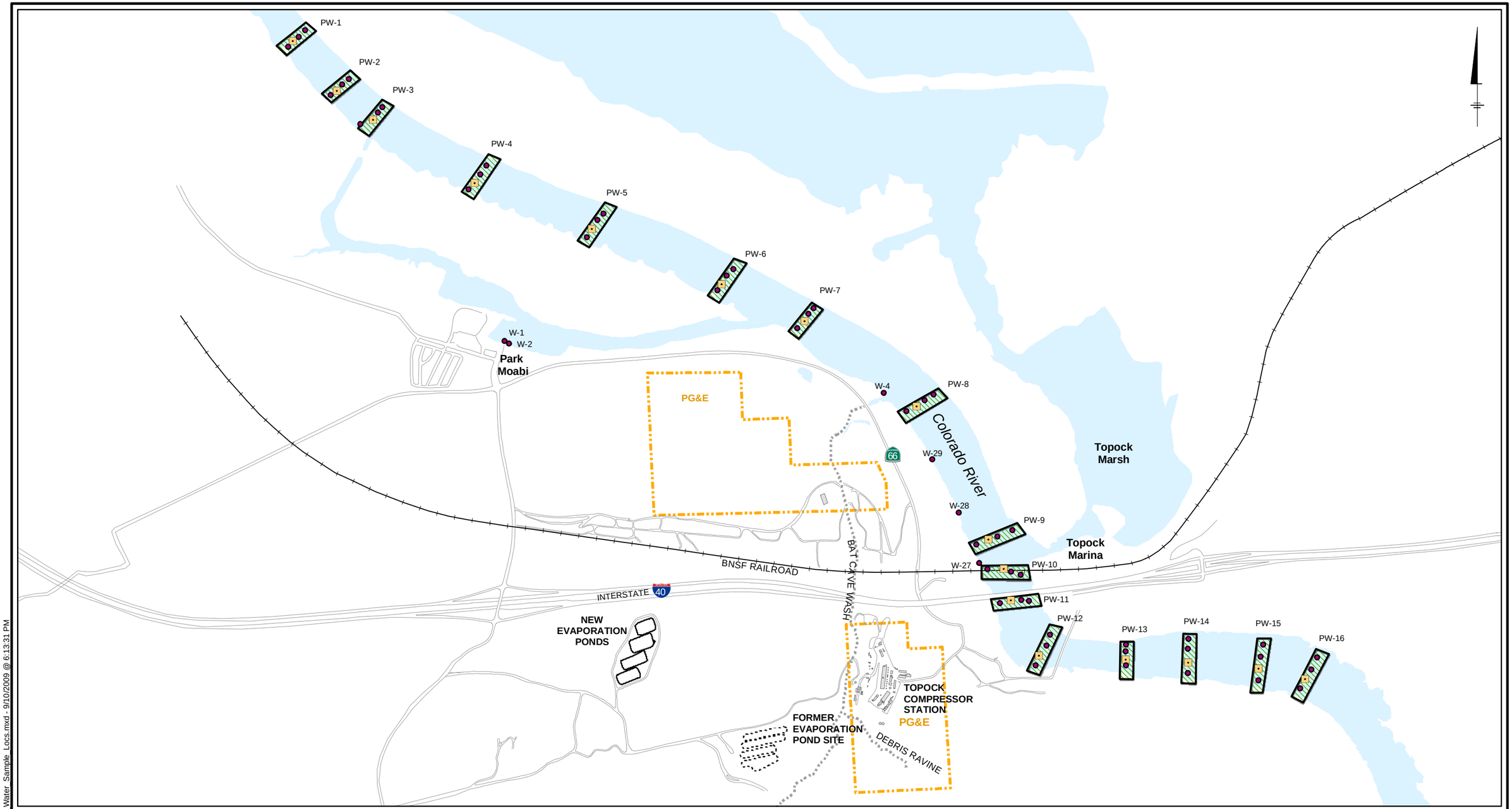
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

SURFACE WATER SAMPLING LOCATIONS

ARCADIS

FIGURE
2-10

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGE\Topock\GW_Risk\MXD\Fig_2-10_SW_Monitoring.mxd - 10/2/2009 @ 11:54:29 AM



LEGEND:

- Pore Water & Surface Water Sampling Location
- Interstitial Water Sampling Location
- Pore Water Sampling Transects

NOTE:

Map Source: CH2M HILL (2005-2008)

0 1,000 2,000 Feet

GRAPHIC SCALE

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

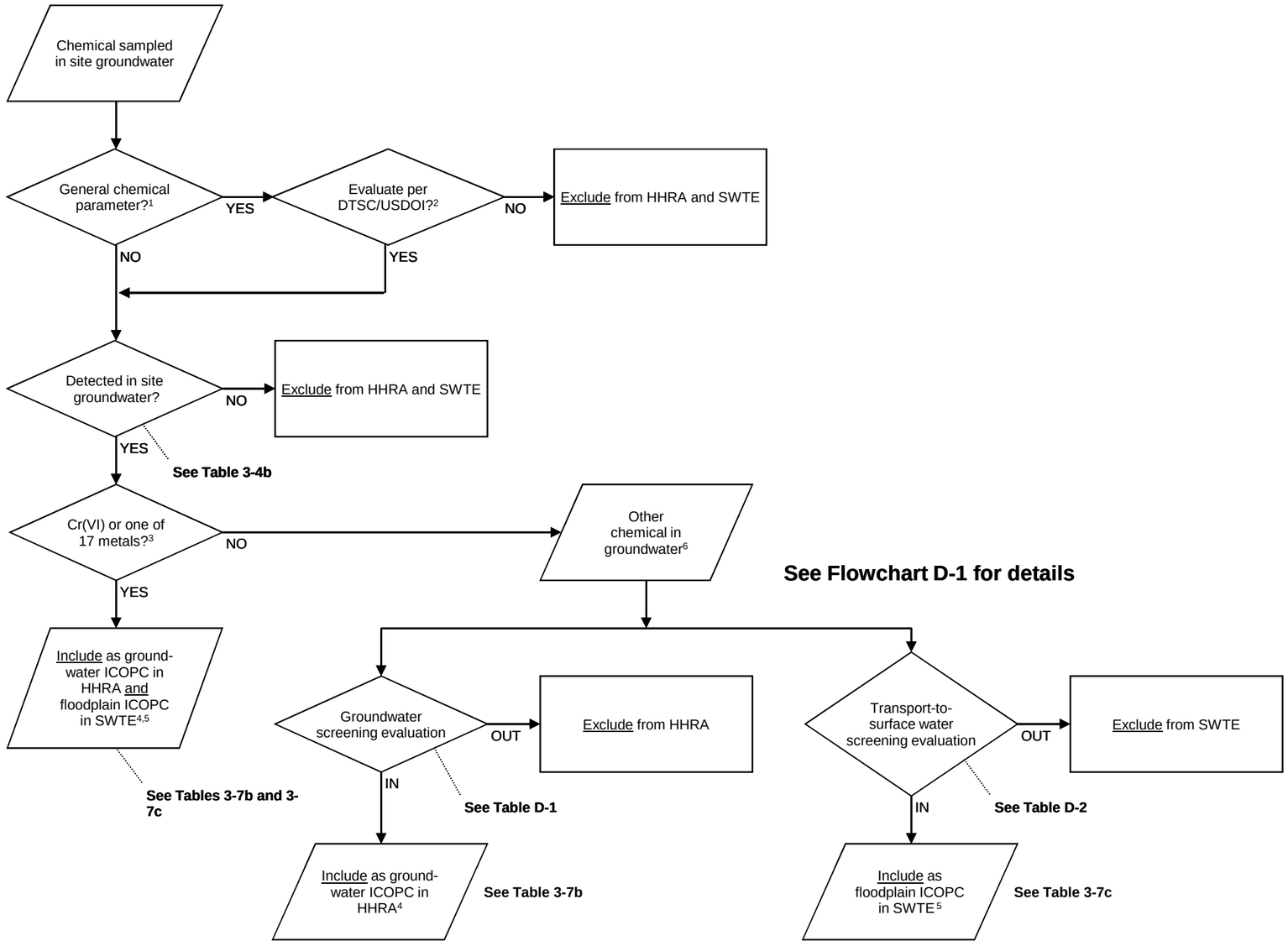
PORE WATER SAMPLING LOCATIONS

ARCADIS

FIGURE
2-11

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
O:\PGETopock\GW_Risk\MXD\Fig_2-11_Pore_Water_Sample_Locs.mxd - 9/10/2009 @ 6:13:31 PM

DETERMINATION OF INITIAL CONSTITUENTS OF POTENTIAL CONCERN (ICOPCs)
(Section 3.2.2 and Appendix D)



Acronyms and Abbreviations:

Cr(VI) = Hexavalent chromium

USDOI = United States Department of the Interior

DTSC = California Environmental Protection Agency Department of Toxic Substances Control

FP = Floodplain

SWTE = Groundwater-to-surface water transport evaluation

ICOPC = Initial constitent of potential concern

COPC = Constitent of potential concern

HHRA = Well-specific quantitative groundwater human health risk assessment

Notes:

(1) General chemical parameters are those explicitly defined as such either in the RFI/RI Volume 2, or in the database of combined RFI/RI Volume 2 and RFI/RI Volume 2 Addendum data provided by CH2M HILL.

(2) As discussed in Section 3.2.2, there are 13 general chemical parameters (categorized as "other inorganics" in this risk assessment) that DTSC and USDOI requested be carried through a screening-level evaluation in order to ascertain whether they should be included in the quantitative groundwater human health risk assessment or the groundwater-to-surface water transport evaluation.

(3) As discussed in Section 3.2.2, total chromium and chloroform are not considered ICOPCs for the quantitative groundwater human health risk assessment or the groundwater-to-surface water transport evaluation, and therefore these two chemicals are not included among the "other chemicals in groundwater" which are processed through the screening evaluations described in Appendix D and summarized in Figure D-1.

(4) Chemicals determined to be groundwater ICOPCs are carried forwards to the well-specific COPC selection process. Determination of well-specific COPCs is discussed in Section 4.1.1 and summarized in Figure 4-1.

(5) Chemicals determined to be floodplain ICOPCs are carried forwards to the groundwater-to-surface-water transport COPC selection process that is discussed in Section 4.1.2 and summarized in Figure4-2.

(6) Other chemicals detected in groundwater are processed through the human health groundwater screening evaluation and the groundwater-to-surface water transport screening evaluation, which are discussed in Appendix D and summarized in Figure D-1.

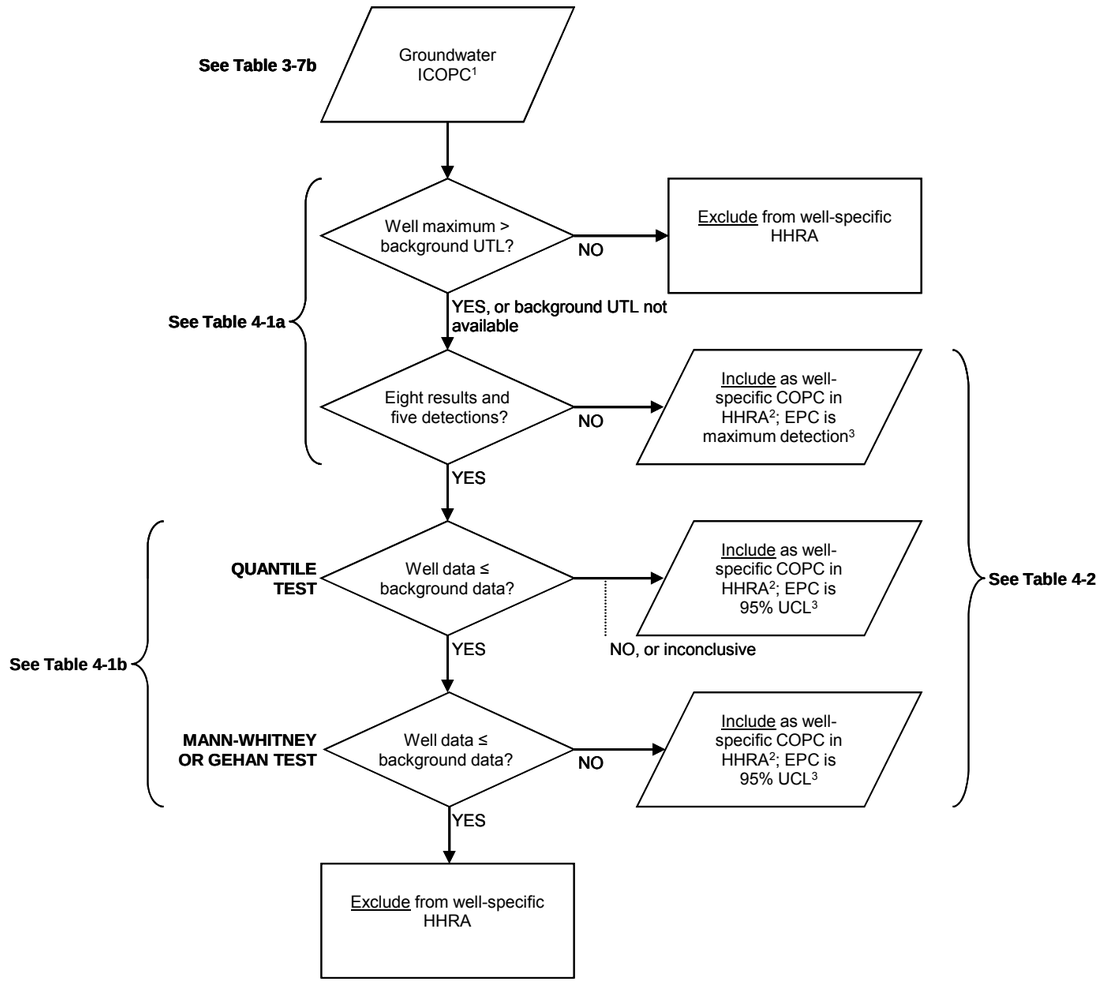
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

DETERMINATION OF INITIAL CONSTITUENTS OF POTENTIAL CONCERN (ICOPCs)

ARCADIS

FIGURE
3-1

DETERMINATION OF WELL-SPECIFIC CONSTITUENTS OF POTENTIAL CONCERN (COPCs)
(Sections 4.1.1 and 4.1.2)



Acronyms and Abbreviations:

95% UCL = 95 percent upper confidence limit of the mean
COPC = Constituent of potential concern
DL = Detection limit
EPC = Exposure point concentration
HHRA = Quantitative groundwater human health risk assessment
ICOPC = Initial constituent of potential concern
ND = Non-detect
UTL = Upper tolerance limit

Notes:

(1) The determination of groundwater ICOPCs is discussed in Section 3 and Appendix D and is summarized in Figure 3-1.

(2) Chemicals determined to be well-specific COPCs are carried forwards to the quantitative well-specific groundwater human health risk assessment.

(3) Exposure point concentration (EPC) is based on 95 percent upper confidence limit of the mean (95% UCL), if chemical/well dataset contains at least eight results including at least five detections; otherwise, EPC is based on maximum detected concentration.

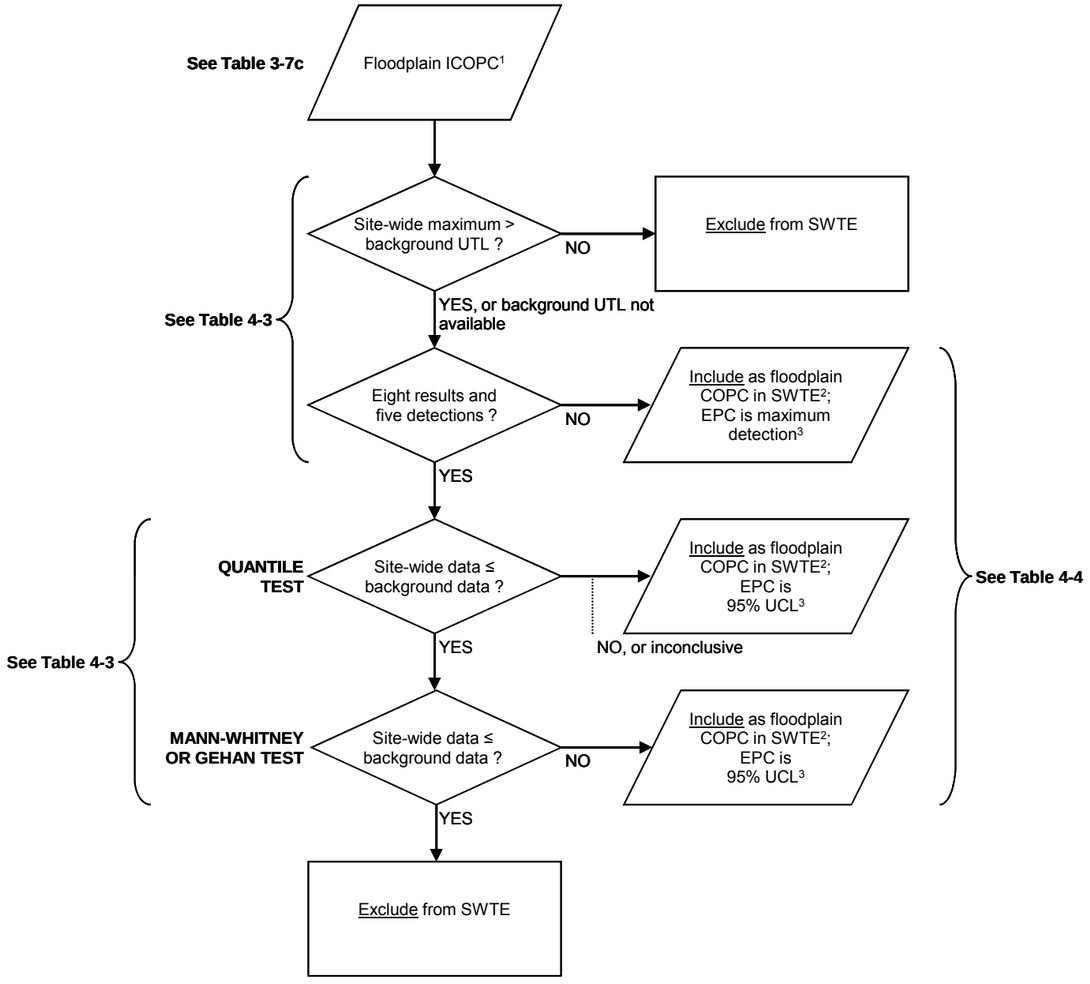
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

DETERMINATION OF WELL-SPECIFIC CONSTITUENTS OF POTENTIAL CONCERN (COPCs)

ARCADIS

FIGURE
4-1

DETERMINATION OF FLOODPLAIN CONSTITUENTS OF POTENTIAL CONCERN (COPCs)
(Sections 4.1.1 and 4.1.4)



Acronyms and Abbreviations:

95% UCL = 95 percent upper confidence limit of the mean
COPC = Constituent of potential concern
EPC = Exposure point concentration
ICOPC = Initial constituent of potential concern
ND = Non-detect
SWTE = Groundwater-to-surface water transport evaluation
UTL = Upper tolerance limit

Notes:

(1) The determination of floodplain ICOPCs is discussed in Section 3 and Appendix D and is summarized in Figure 3-1.

(2) Chemicals determined to be floodplain COPCs are carried forwards to the groundwater-to-surface water transport evaluation, which is presented in Section 4.2 and summarized in Figure 4-3.

(3) Exposure point concentration (EPC) is based on 95 percent upper confidence limit of the mean (95% UCL), if chemical/floodplain dataset contains at least eight results including at least five detections; otherwise, EPC is based on maximum detected concentration.

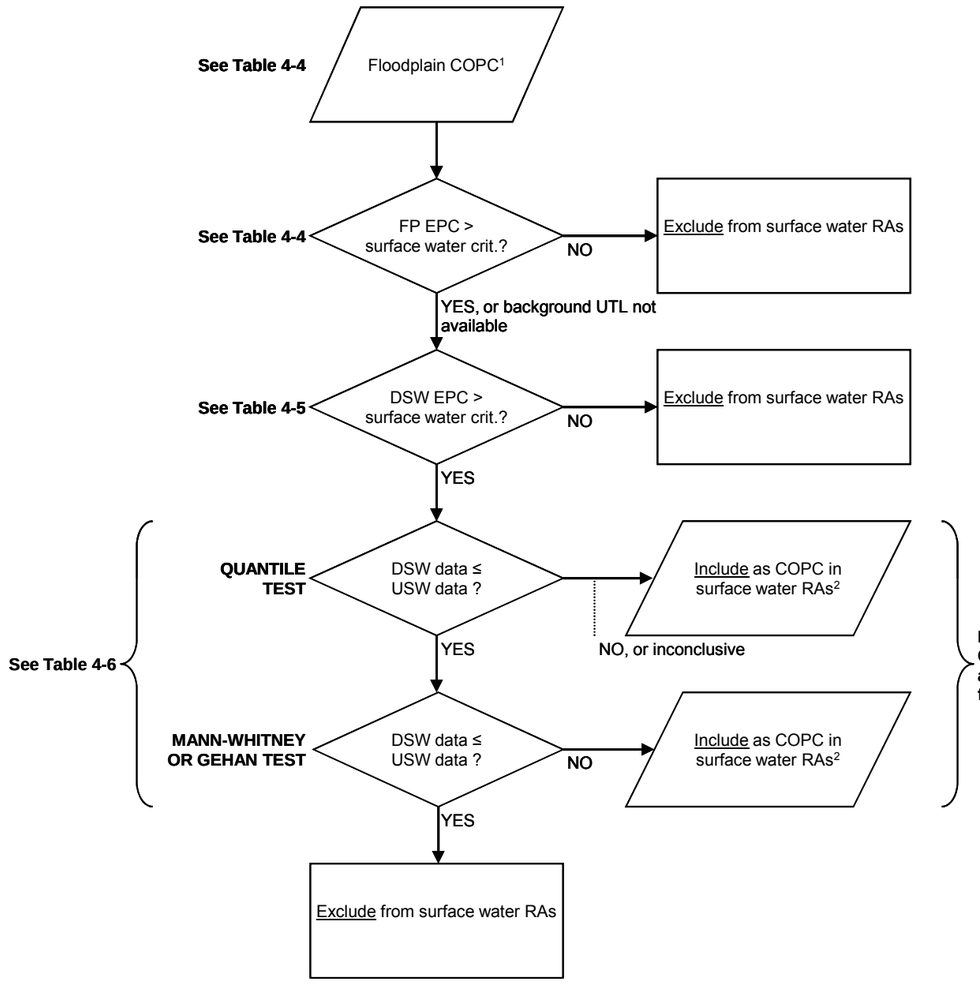
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

DETERMINATION OF FLOODPLAIN CONSTITUENTS OF POTENTIAL CONCERN (COPCs)

ARCADIS

FIGURE
4-2

GROUNDWATER-TO-SURFACE WATER TRANSPORT EVALUATION
(Section 4.2)



No chemicals are determined to be COPCs in surface water, *i.e.*, all floodplain COPCs are excluded from the surface water human health and ecological risk assessments through the evaluation process summarized here; see Section 4.2 for detailed discussion

Acronyms and Abbreviations:

COPC = Constituent of potential concern

crit. = Criterion

DSW = Downstream surface water

EPC = Exposure point concentration

FP = Floodplain

RAs = Human health and ecological risk assessments

USW = Upstream (*i.e.* , background) surface water

Notes:

(1) The determination of floodplain COPCs is discussed in Section 4.1.2 and is summarized in Figure 4-2.

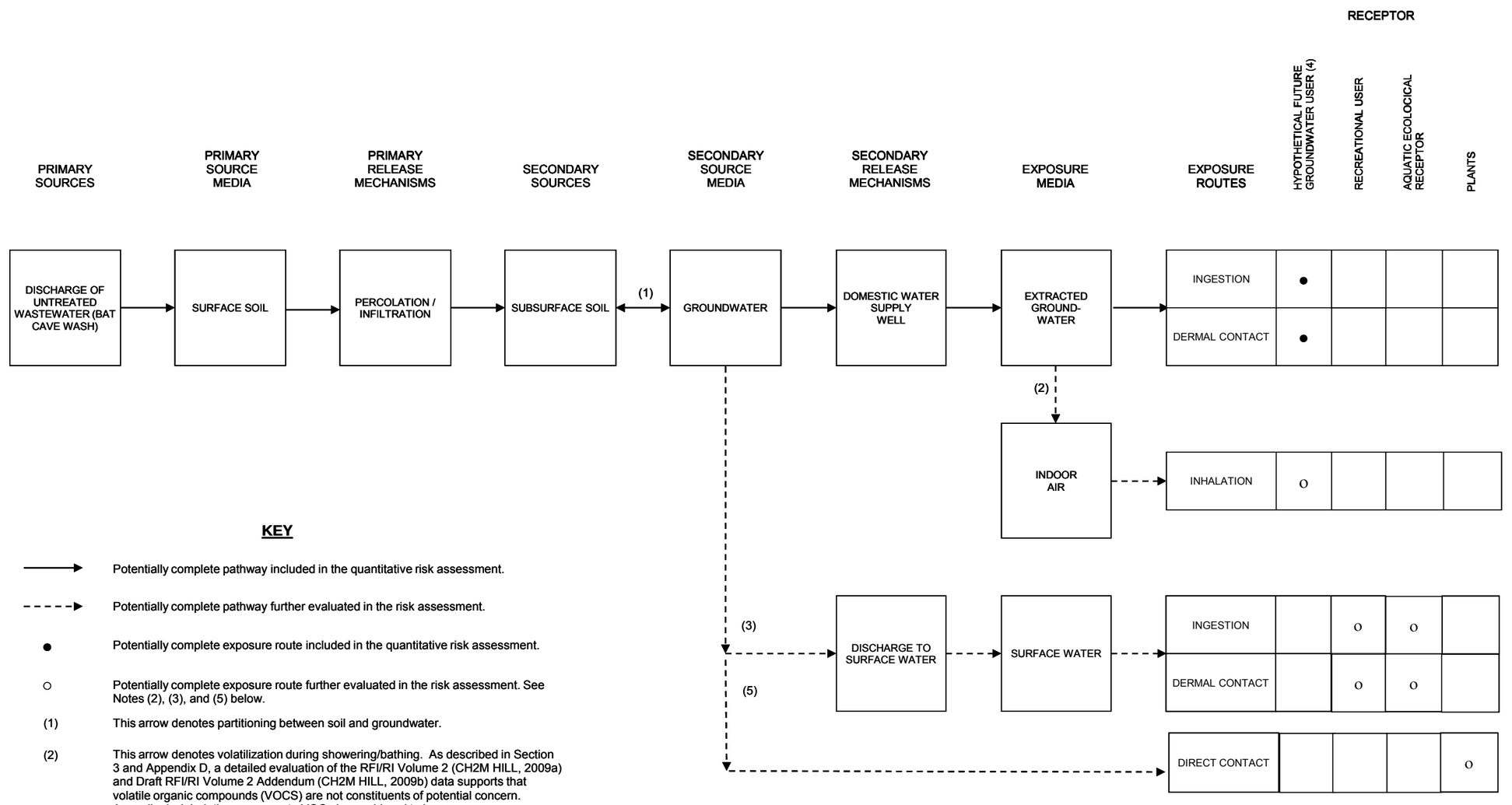
(2) Chemicals determined to be COPCs is surface water would be carried forwards to a surface water human health and ecological risk assessment. No chemicals are determined to be COPCs in surface water.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

GROUNDWATER-TO-SURFACE WATER TRANSPORT EVALUATION

ARCADIS

FIGURE
4-3



KEY

→	Potentially complete pathway included in the quantitative risk assessment.
- - - →	Potentially complete pathway further evaluated in the risk assessment.
●	Potentially complete exposure route included in the quantitative risk assessment.
o	Potentially complete exposure route further evaluated in the risk assessment. See Notes (2), (3), and (5) below.
(1)	This arrow denotes partitioning between soil and groundwater.
(2)	This arrow denotes volatilization during showering/bathing. As described in Section 3 and Appendix D, a detailed evaluation of the RFI/RI Volume 2 (CH2M HILL, 2009a) and Draft RFI/RI Volume 2 Addendum (CH2M HILL, 2009b) data supports that volatile organic compounds (VOCS) are not constituents of potential concern. Accordingly, inhalation exposure to VOCs is considered to be an incomplete/insignificant pathway in the risk assessment.
(3)	This arrow denotes groundwater-to-surface water transport. Section 4.2 presents a detailed evaluation of this transport pathway, in accordance with the approach set forth in the RAWP (ARCADIS, 2008). As discussed, the empirical data suggest that potential site-related chemicals in groundwater are not being transported in significant concentrations to the Colorado River. Accordingly, the groundwater-to-surface water transport pathway will not be evaluated any further in this risk assessment.
(4)	As described in the text, under current conditions there are no users of the groundwater impacted by the plume and, thus, no potential for human exposure. Groundwater users in this risk assessment, therefore, are strictly hypothetical and should not be construed to represent actual receptors.
(5)	Additional potential ecological exposure pathways were added based on comments to the Draft February 2009 Groundwater Risk Assessment by DTSC and are evaluated further in Appendix I.

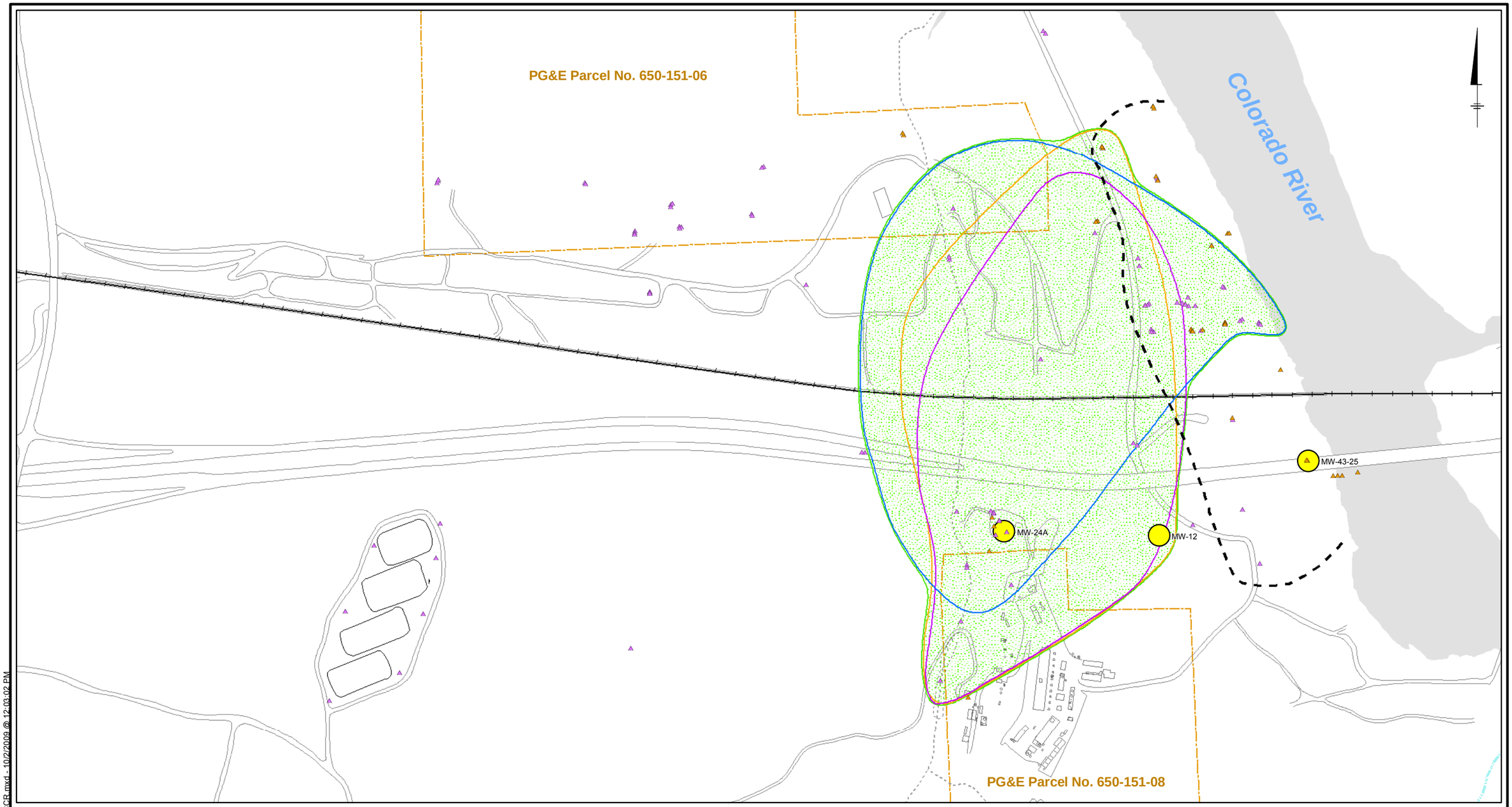
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

CONCEPTUAL SITE MODEL

ARCADIS

FIGURE 5-1



LEGEND:

Cumulative Cancer Risk (CCR)[1]

- Not Analyzed
- Not Detected
- $0 \le CCR \le 10^{-5}$
- $10^{-5} \le CCR \le 10^{-3}$
- $10^{-3} \le CCR \le 10^{-1}$

- Floodplain Zone[2]
- Hexavalent Chromium Plume[3]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells
- PG&E Property Boundaries

0 500 1,000 Feet

GRAPHIC SCALE

NOTES:
1. Shown is the cancer risk resulting from arsenic, the only constituents of potential concern. Therefore, "not sampled" and "not detected" well labels indicate where arsenic was not sampled or not detected.
2. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
3. Hexavalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
4. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

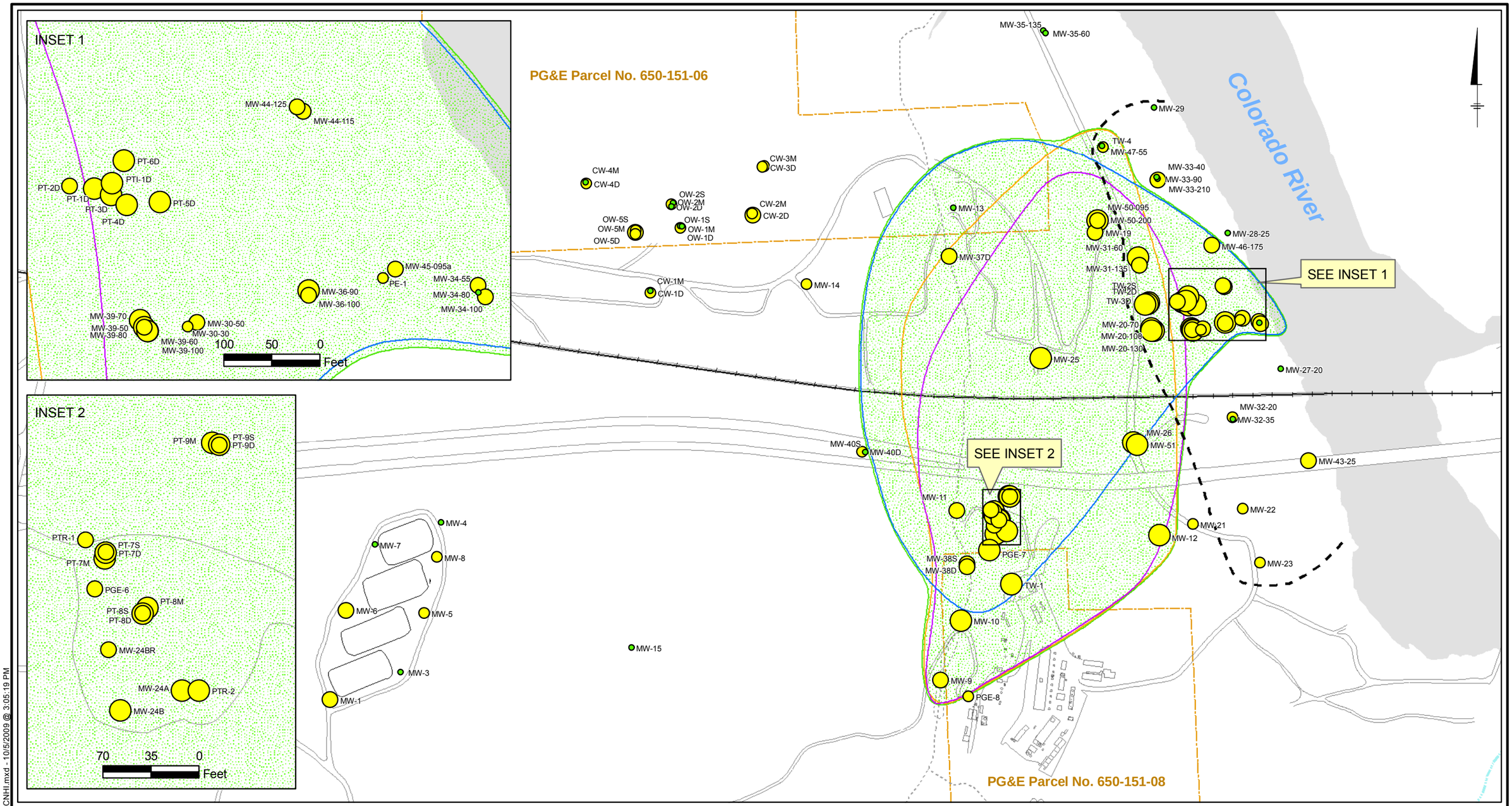
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ESTIMATED POTENTIAL CUMULATIVE CANCER RISKS: FUTURE HYPOTHETICAL AGE-ADJUSTED ADULT GROUNDWATER USER

ARCADIS

FIGURE **7-1**

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGE\Topock\GW_Risk\MXD\Fig_7-1_Est_CCR.mxd - 10/2/2009 @ 12:03:02 PM



LEGEND:

Cumulative Noncancer Hazard Index (HI)

- ≤ 1.0
- 1.0 < HI ≤ 5.0
- 5.0 < HI ≤ 50
- 50 < HI

- Floodplain Zone[2]
- Hexavalent Chromium Plume[3]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells
- PG&E Property Boundaries

0 500 1,000 Feet

GRAPHIC SCALE

NOTES:
1. Wells for which all constituents of potential concern were not sampled or not detected are not shown.
2. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
3. Hexavalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
4. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ESTIMATED POTENTIAL CUMULATIVE NONCANCER HAZARD INDICES: FUTURE HYPOTHETICAL CHILD GROUNDWATER USER

ARCADIS

FIGURE **7-2**

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGE\Topock\GW_Risk\MXD\Fig_7-2_Est_PCNHI.mxd - 10/5/2009 @ 3:05:19 PM

Well With Cumulative Hazard Index Above 1.0[1]

Color illustrates constituents of potential concern (COPCs) and wedge size illustrates the approximate contribution (%) of COPCs to the estimated potential cumulative noncancer hazard indices: future hypothetical child groundwater user.

Constituents of Potential Concern (COPCs):

- Antimony
- Arsenic
- Barium
- Chromium, hexavalent
- Cobalt
- Copper
- Fluoride
- Molybdenum
- Nitrate as nitrogen
- Selenium
- Silver
- Thallium
- Vanadium

Example: Well ID CW-3M
Contributions of different COPCs to the total estimated potential noncancer hazard index.

- Molybdenum approximately 30%
- Vanadium approximately 70%

PG&E Parcel No. 650-151-06

PG&E Parcel No. 650-151-08

Colorado River

Park Moabi 4
5100' northwest

CW-4D
CW-3D
CW-3M
OW-2S
OW-5S
OW-5D
OW-1D
OW-5M
CW-2M
CW-2D
CW-1D
MW-14
MW-37D
MW-47-55
MW-33-40
MW-33-90
MW-50-200
MW-50-95
MW-19
MW-46-175
MW-44-115
MW-44-125
MW-36-90
MW-34-55
MW-45-095a
MW-34-100
MW-36-100
MW-25
MW-32-20
MW-26
MW-43-25
MW-40D
MW-22
MW-21
MW-12
MW-23
MW-38S
MW-38D
TW-1
MW-10
MW-9
PGE-8
MW-8
MW-6
MW-5
MW-3
MW-1

e	f	g	h
MW-31-135	PT-2D	PTI-1D	PT-6D
MW-31-6O	PT-1D	MW-34-50	PT-4D
MW-20-130	PT-3D	MW-39-70	PE-1
MW-20-70	TW-2S	MW-39-80	MW-30-50
PT-5D	TW-2D	MW-39-100	MW-30-30
MW-20-100	TW-3D	MW-34-60	

a	b	c	d
PT-7S	PT-7D	PT-9S	PT-9M
PT-7M	PGE-6	PT-8S	PT-9D
MW-11	MW-24B	PT-8M	MW-24A
MW-24BR	PTR-1	PT-8D	PTR-2
		PGE-7	

0 500 1,000 Feet
GRAPHIC SCALE

LEGEND:

- Well With Cumulative Hazard Index Above 1.0[1]
- Other Sampling Location
- Floodplain Zone[2]
- PG&E Property Boundaries
- Hexvalent Chromium Plume[3]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells

NOTES:
1. Shown are percentage contributions to the estimated potential cumulative noncancer hazard indices for COPCs contributing over 20% at a specific well. Wells included have an estimated potential cumulative noncancer hazard index for the future hypothetical child groundwater user above 1.0. See Table 7-4 for complete details.
2. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
3. Hexvalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
4. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

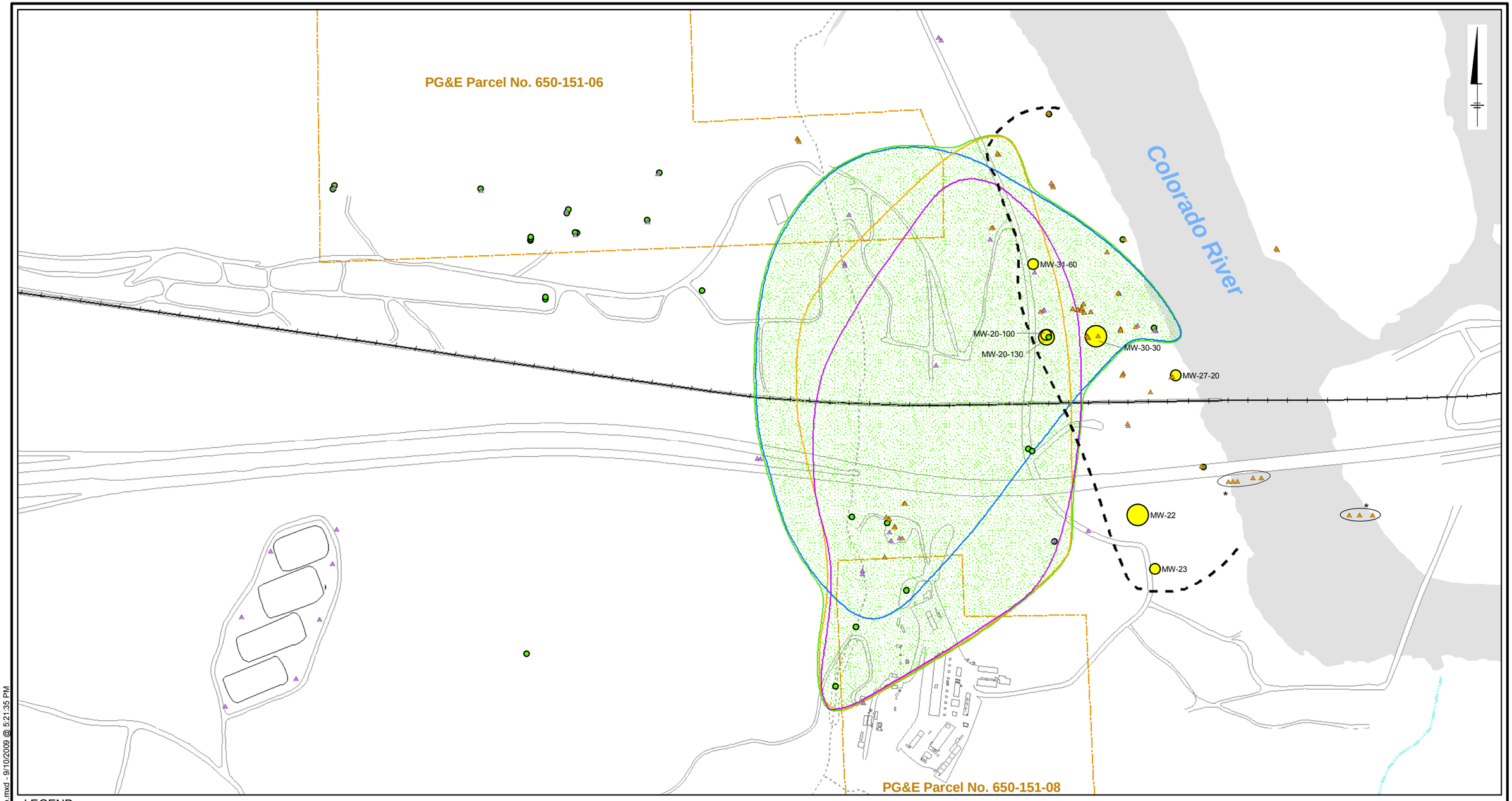
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

CONTRIBUTIONS OF COPCs TO ESTIMATED POTENTIAL NONCANCER HAZARD INDICES: FUTURE HYPOTHETICAL CHILD GROUNDWATER USER

ARCADIS

FIGURE
7-3

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGETopock\GW_Risk\MXD\Fig_7-3_All COPCs.mxd - 9/10/2009 @ 5:20:38 PM



LEGEND:

Estimated Exposure Point Concentrations (EPCs) in Groundwater- Lead[1] (mg/L)

- Not sampled
- Not detected
- Under CAL (0.015)[2]
- 0.015 < EPC ≤ 0.030
- 0.030 < EPC ≤ 0.045
- 0.045 < EPC ≤ 0.076

- Floodplain Zone[3]
- Hexavalent Chromium Plume[4]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells
- PG&E Property Boundaries

0 500 1,000 Feet

GRAPHIC SCALE

NOTES:

1. See Table 7-5 for complete details.
2. Screening criterion for lead is the California Action Level (CAL) because no maximum contaminant level (MCL) is promulgated.
3. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
4. Hexavalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
5. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ESTIMATED EPCs IN GROUNDWATER - LEAD

ARCADIS

FIGURE **7-4**

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGETopock\GW_Risk\MXD\Fig_7-4_EPCs-Pb.mxd - 9/10/2009 @ 5:21:35 PM

Park Moabi-4

PG&E Parcel No. 650-151-06

Colorado River

MW-51

MW-40D

PT-8M

MW-24A

MW-5

MW-10

MW-9

PG&E Parcel No. 650-151-08

LEGEND:

Estimated Potential Noncancer Hazard Indices (HI) for Nitrate (as Nitrogen): Future Hypothetical Child Groundwater User

- Not Sampled
- Not Detected
- ≤ 1.0
- 1.0 < HI ≤ 5.0
- 5.0 < HI ≤ 50
- 50 < HI

[2] Floodplain Zone[3]

Hexavalent Chromium Plume[4]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells

PG&E Property Boundaries

0 700 1,400 Feet

GRAPHIC SCALE

NOTES:

1. Well identification labels are shown on this figure only for wells in which Nitrate as Nitrogen is contributing materially to the estimated cumulative noncancer hazard based on the analysis presented in Appendix P.
2. Hazard indices are indicated for all wells where the HI for Nitrate exceeds the threshold HI of 1.0. See Table 7-2 for complete details.
3. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
4. Hexavalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
5. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

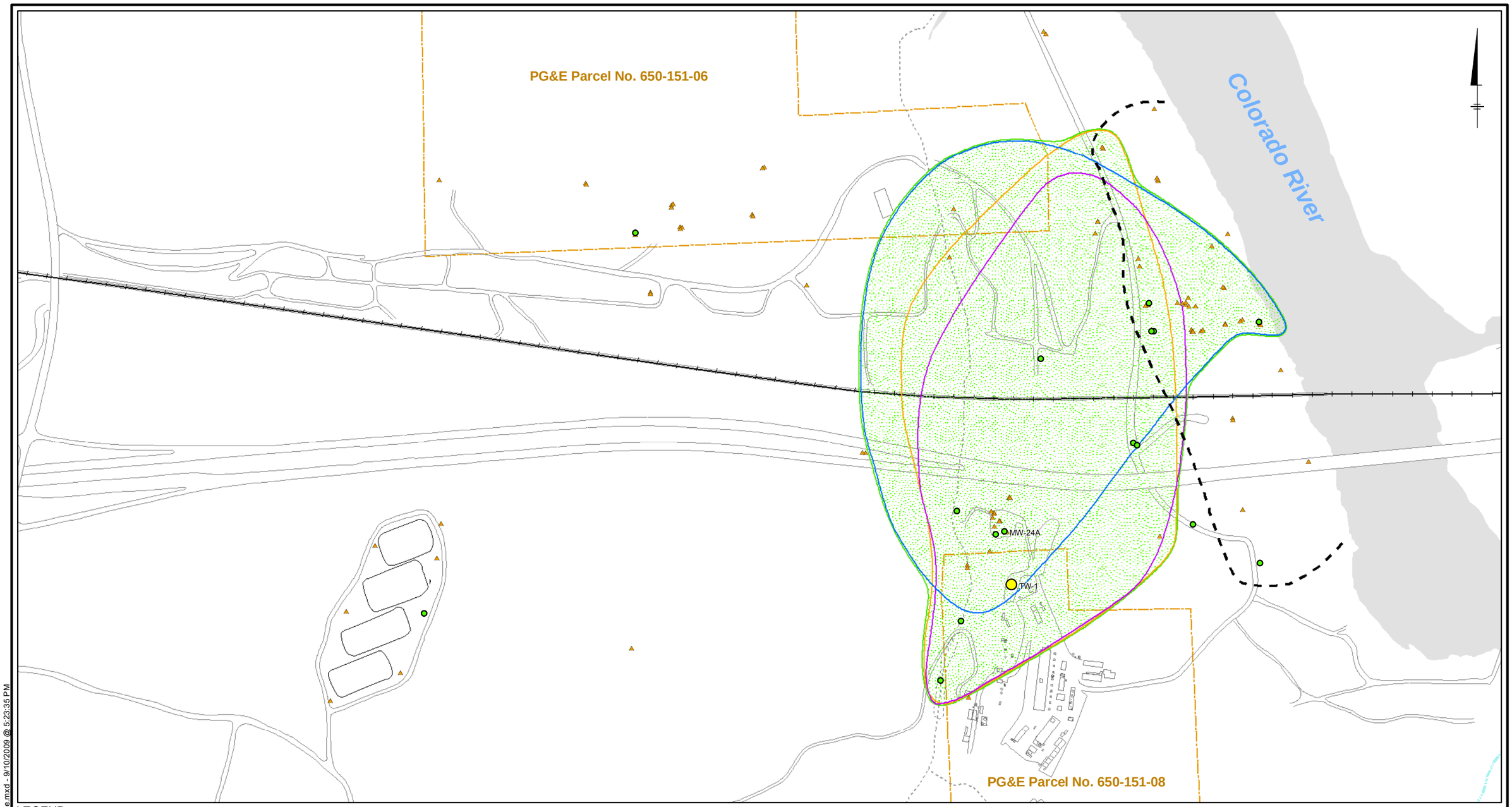
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ESTIMATED POTENTIAL NONCANCER HAZARD INDICES FOR NITRATE AS NITROGEN: FUTURE HYPOTHETICAL CHILD GROUNDWATER USER

ARCADIS

FIGURE 7-5

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGE\Topock\GW_Risk\MXD\Fig_7-5_NHI-NO3 as N.mxd - 9/10/2009 @ 5:22:27 PM



LEGEND:

Estimated Potential Noncancer Hazard Indices (HI) for Selenium: Future Hypothetical Child Groundwater User [2]

- Not Sampled
- Not Detected
- ≤ 1.0
- 1.0 < HI ≤ 5.0
- 5.0 < HI ≤ 50
- 50 < HI
- Floodplain Zone [3]
- Hexavalent Chromium Plume [4]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells
- PG&E Property Boundaries

0 500 1,000 Feet

GRAPHIC SCALE

NOTES:
1. Well identification labels are shown on this figure only for wells in which Selenium is contributing materially to the estimated cumulative noncancer hazard based on the analysis presented in Appendix P.
2. Hazard indices are indicated for all wells where the HI for Selenium exceeds the threshold HI of 1.0. See Table 7-2 for complete details.
3. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
4. Hexavalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
5. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

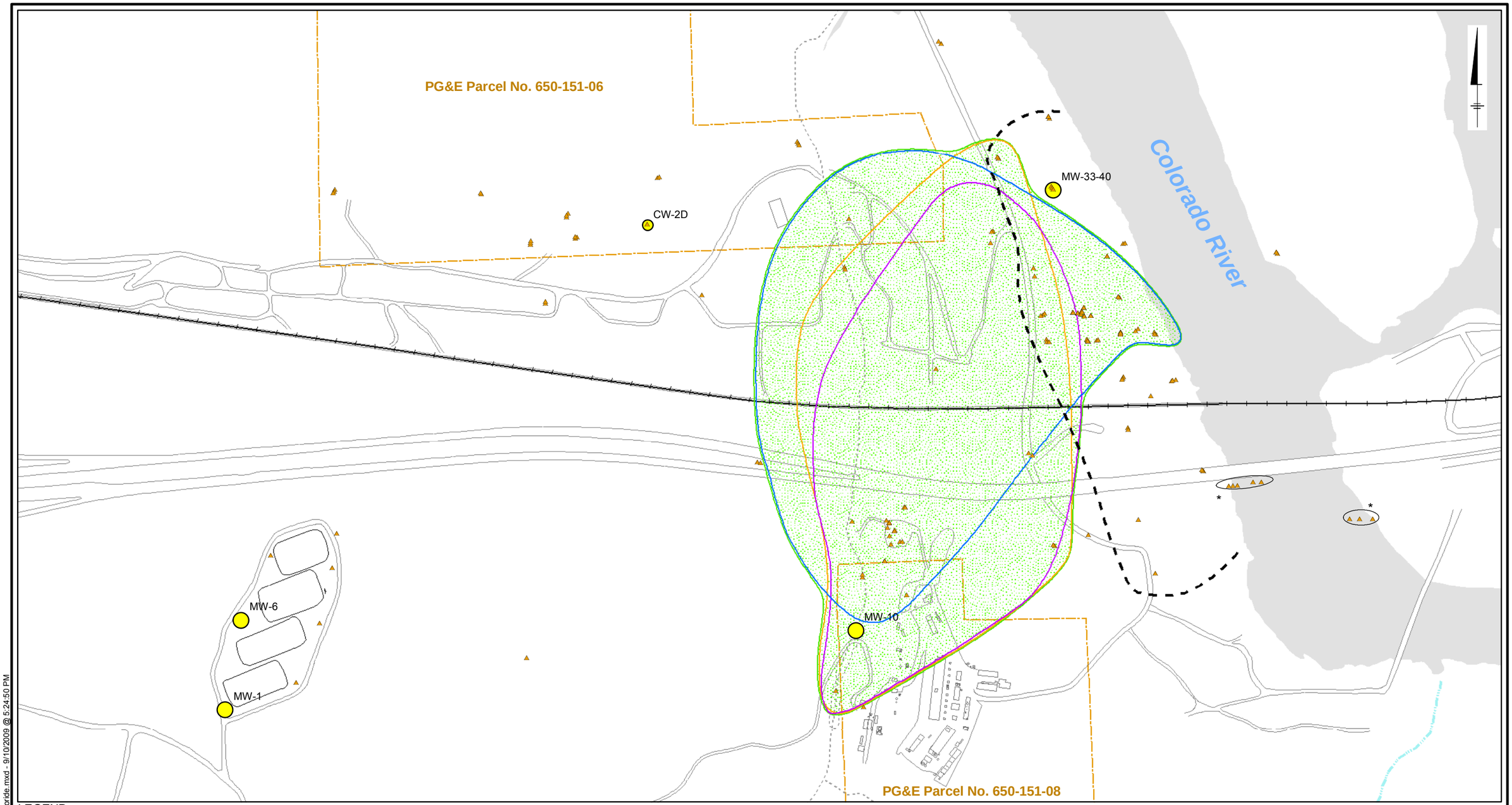
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ESTIMATED POTENTIAL NONCANCER HAZARD INDICES FOR SELENIUM: FUTURE HYPOTHETICAL CHILD GROUNDWATER USER

ARCADIS

FIGURE 7-6

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGE\Topock\GW_RiskMXD\Fig_7-6_NHI-Se.mxd - 9/10/2009 @ 5:23:35 PM



LEGEND:

Estimated Potential Noncancer Hazard Index (HI)[2] for Fluoride: Future Hypothetical Child Groundwater User

- Not Sampled
- Not Detected
- ≤ 1.0
- 1.0 < HI ≤ 5.0
- 5.0 < HI ≤ 50
- 50 < HI

- Floodplain Zone[3]
- Hexvalent Chromium Plume[4]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells
- PG&E Property Boundaries

0 500 1,000 Feet

GRAPHIC SCALE

NOTES:

1. Well identification labels are shown on this figure only for wells in which Fluoride is contributing materially to the estimated cumulative noncancer hazard based on the analysis presented in Appendix P.
2. Hazard indices are indicated for all wells where the HI for Fluoride exceeds the threshold HI of 1.0 See Table 7-2 for complete details.
3. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
4. Hexavalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
5. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

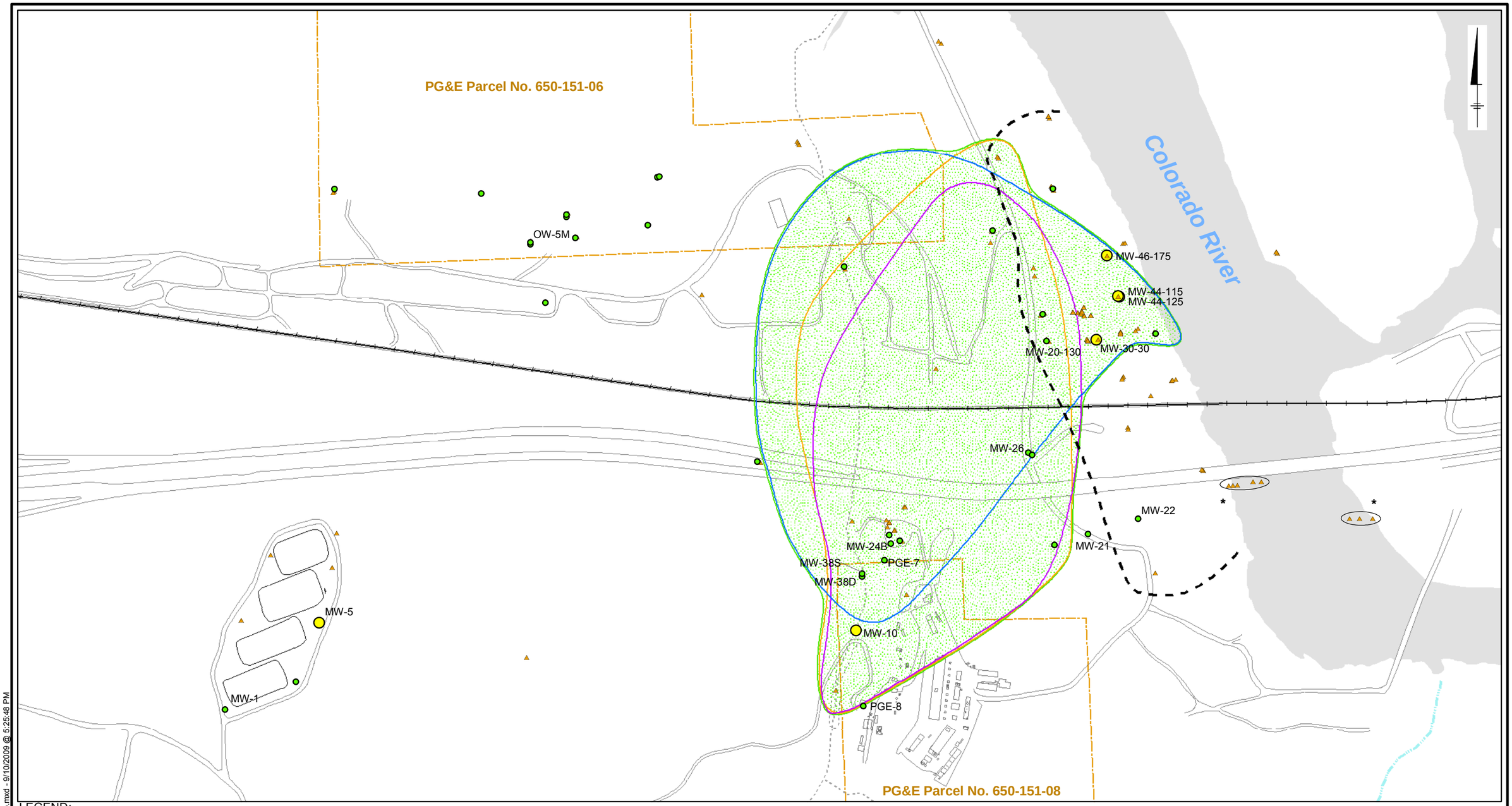
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ESTIMATED POTENTIAL NONCANCER HAZARD INDICES FOR FLUORIDE: FUTURE HYPOTHETICAL CHILD GROUNDWATER USER

ARCADIS

FIGURE **7-7**

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGETopock\GW_Risk\MXD\Fig_7-7_NHI-Fluoride.mxd - 9/10/2009 @ 5:24:50 PM



LEGEND:

Estimated Potential Noncancer Hazard Indices (HI) for[2] Molybdenum: Future Hypothetical Child Groundwater User

- Not Sampled
- Not Detected
- ≤ 1.0
- 1.0 < HI ≤ 5.0
- 5.0 < HI ≤ 50
- 50 < HI

- Floodplain Zone[3]
- Hexvalent Chromium Plume[4]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells
- PG&E Property Boundaries

0 500 1,000 Feet

GRAPHIC SCALE

NOTES:

1. Well identification labels are shown on this figure only for wells in which Molybdenum is contributing materially to the estimated cumulative noncancer hazard based on the analysis presented in Appendix P.
2. Hazard indices are indicated for all wells where the HI for Molybdenum exceeds the threshold HI of 1.0. See Table 7-2 for complete details.
3. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
4. Hexavalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
5. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

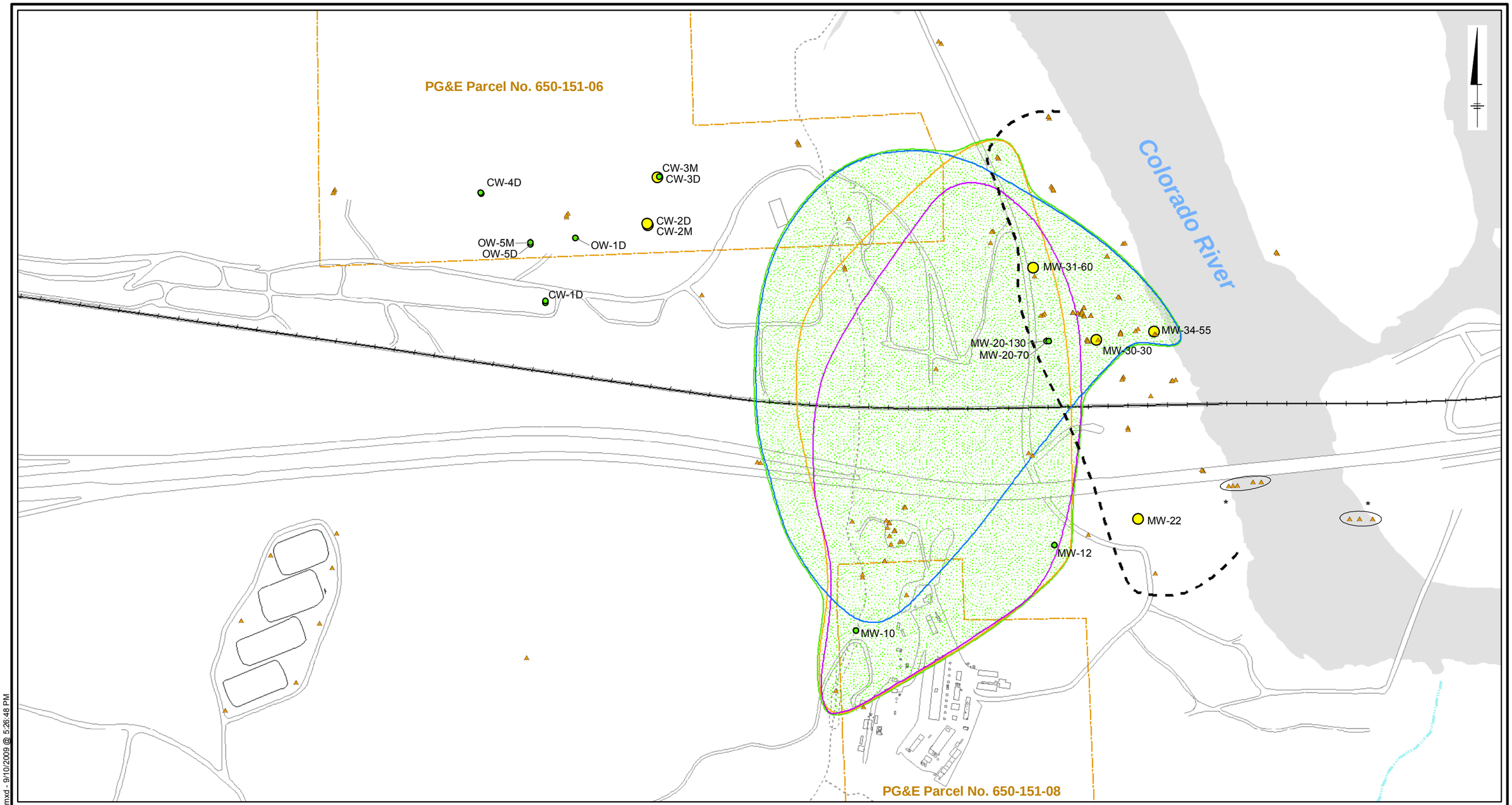
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ESTIMATED POTENTIAL NONCANCER HAZARD INDICES FOR MOLYBDENUM: FUTURE HYPOTHETICAL CHILD GROUNDWATER USER

ARCADIS

FIGURE 7-8

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
G:\PGE\Topock\GW_Risk\MXD\Fig_7-8_NHI-Mo.mxd - 9/10/2009 @ 5:25:48 PM



LEGEND:

Estimated Potential Noncancer Hazard Indices (HI) for Vanadium: Future Hypothetical Child Groundwater User[2]

- Not Sampled
- Not Detected
- ≤ 1.0
- 1.0 < HI ≤ 5.0
- 5.0 < HI ≤ 50
- 50 < HI

- Floodplain Zone[3]
- Hexavalent Chromium Plume[4]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells
- PG&E Property Boundaries

0 500 1,000 Feet

GRAPHIC SCALE

NOTES:

1. Well identification labels are shown on this figure only for wells in which Vanadium is contributing materially to the estimated cumulative noncancer hazard based on the analysis presented in Appendix P.
2. Hazard indices are indicated for all wells where the HI for Vanadium exceeds the threshold HI of 1.0. See Table 7-2 for complete details.
3. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
4. Hexevalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
5. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

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NEEDLES, CALIFORNIA

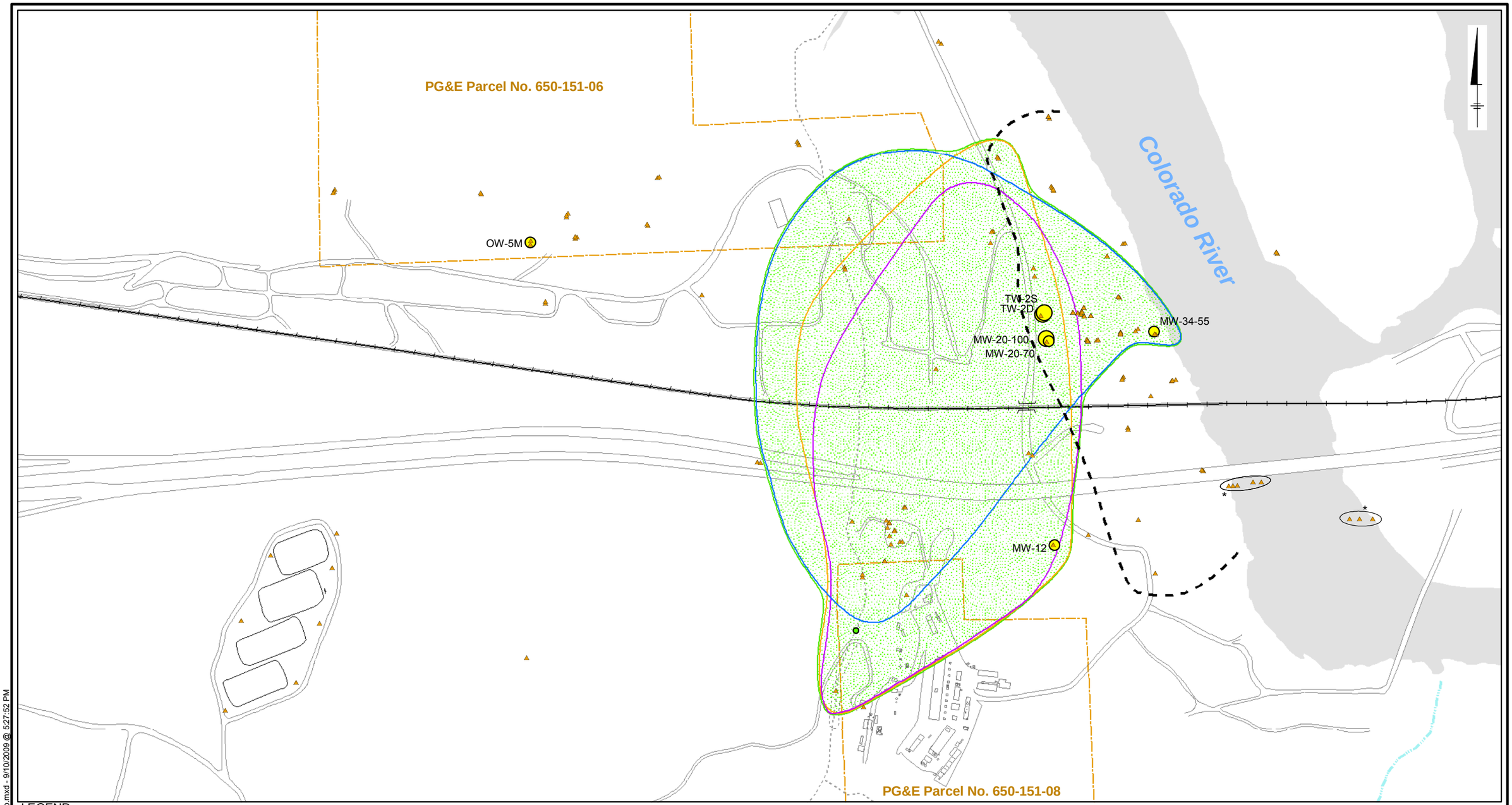
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ESTIMATED POTENTIAL NONCANCER HAZARD INDICES FOR VANADIUM: FUTURE HYPOTHETICAL CHILD GROUNDWATER USER

ARCADIS

FIGURE **7-9**

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGETopock\GW_Risk\MXD\Fig_7-9_NHI-Vn.mxd - 9/10/2009 @ 5:26:48 PM



LEGEND:

Estimated Potential Noncancer Hazard Indices (HI) for Antimony: Future Hypothetical Child Groundwater User[2]

- Not Sampled
- Not Detected
- ≤ 1.0
- 1.0 < HI ≤ 5.0
- 5.0 < HI ≤ 50
- 50 < HI

- Floodplain Zone[3]
- Hexavalent Chromium Plume[4]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells
- PG&E Property Boundaries

0 500 1,000 Feet

GRAPHIC SCALE

NOTES:

1. Well identification labels are shown on this figure only for wells in which Antimony is contributing materially to the estimated cumulative noncancer hazard based on the analysis presented in Appendix P.
2. Hazard indices are indicated for all wells where the HI for Antimony exceeds the threshold HI of 1.0. See Table 7-2 for complete details.
3. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
4. Hexevalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
shown in Table 3-3 are based on the depth-specific plumes.
5. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

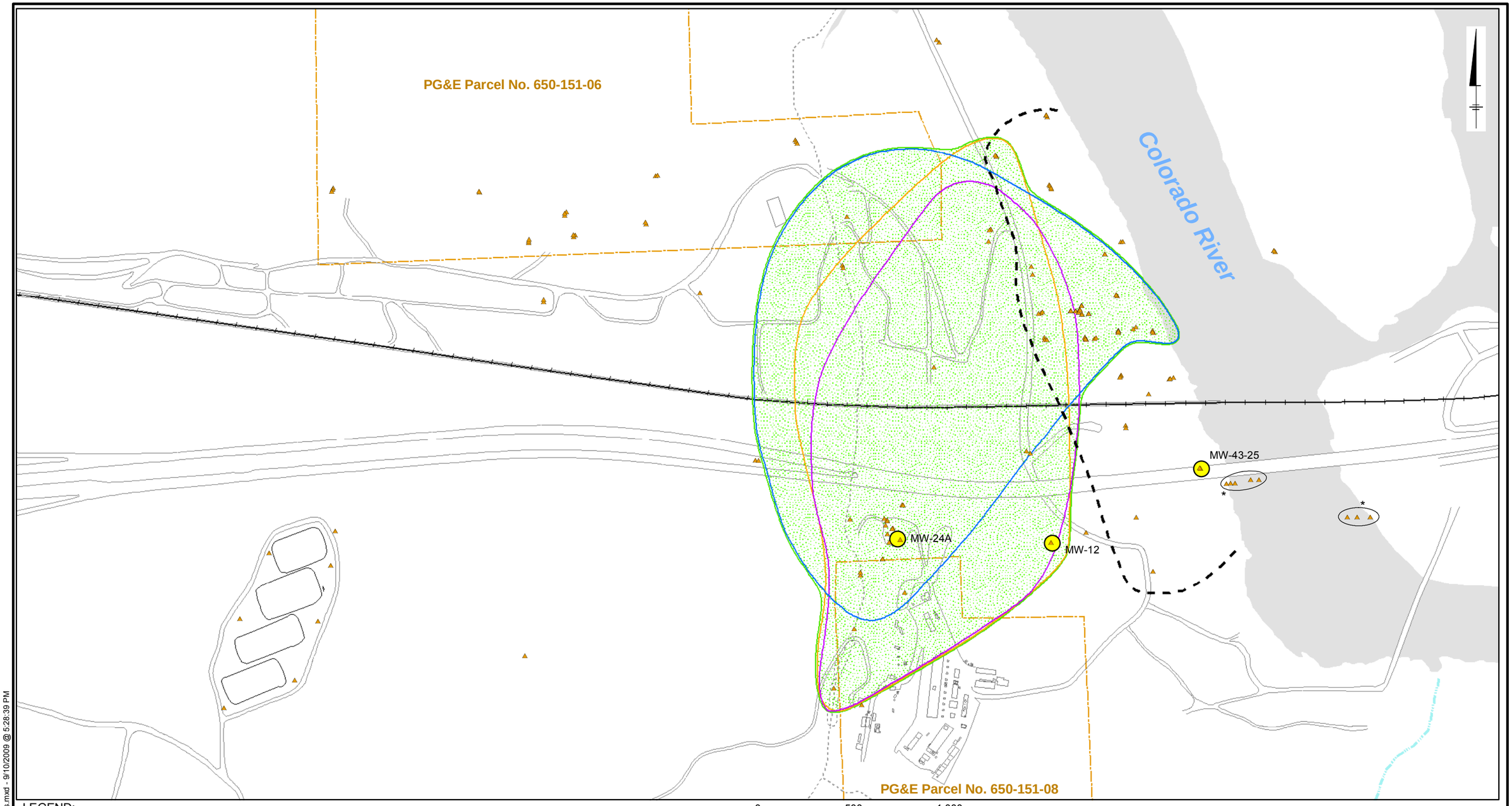
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ESTIMATED POTENTIAL NONCANCER HAZARD INDICES FOR ANTIMONY: FUTURE HYPOTHETICAL CHILD GROUNDWATER USER

ARCADIS

FIGURE **7-10**

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGETopock\GW_Risk\MXD\Fig_7-10_NHI-Sb.mxd - 9/10/2009 @ 5:27:52 PM



LEGEND:

Estimated Potential Noncancer Hazard Indices (HI) for Arsenic: Future Hypothetical Child Groundwater User[2]

- Not Sampled
- Not Detected
- ≤ 1.0
- 1.0 < HI ≤ 5.0
- 5.0 < HI ≤ 50
- 50 < HI

- Floodplain Zone[3]
- Hexavalent Chromium Plume[4]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells
- PG&E Property Boundaries

NOTES:

1. Well identification labels are shown on this figure only for wells in which Arsenic is contributing materially to the estimated cumulative noncancer hazard based on the analysis presented in Appendix P.
2. Hazard indices are indicated for all wells where the HI for Arsenic exceeds the threshold HI of 1.0. See Table 7-2 for complete details.
3. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
4. Hexavalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
shown in Table 3-3 are based on the depth-specific plumes.
5. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

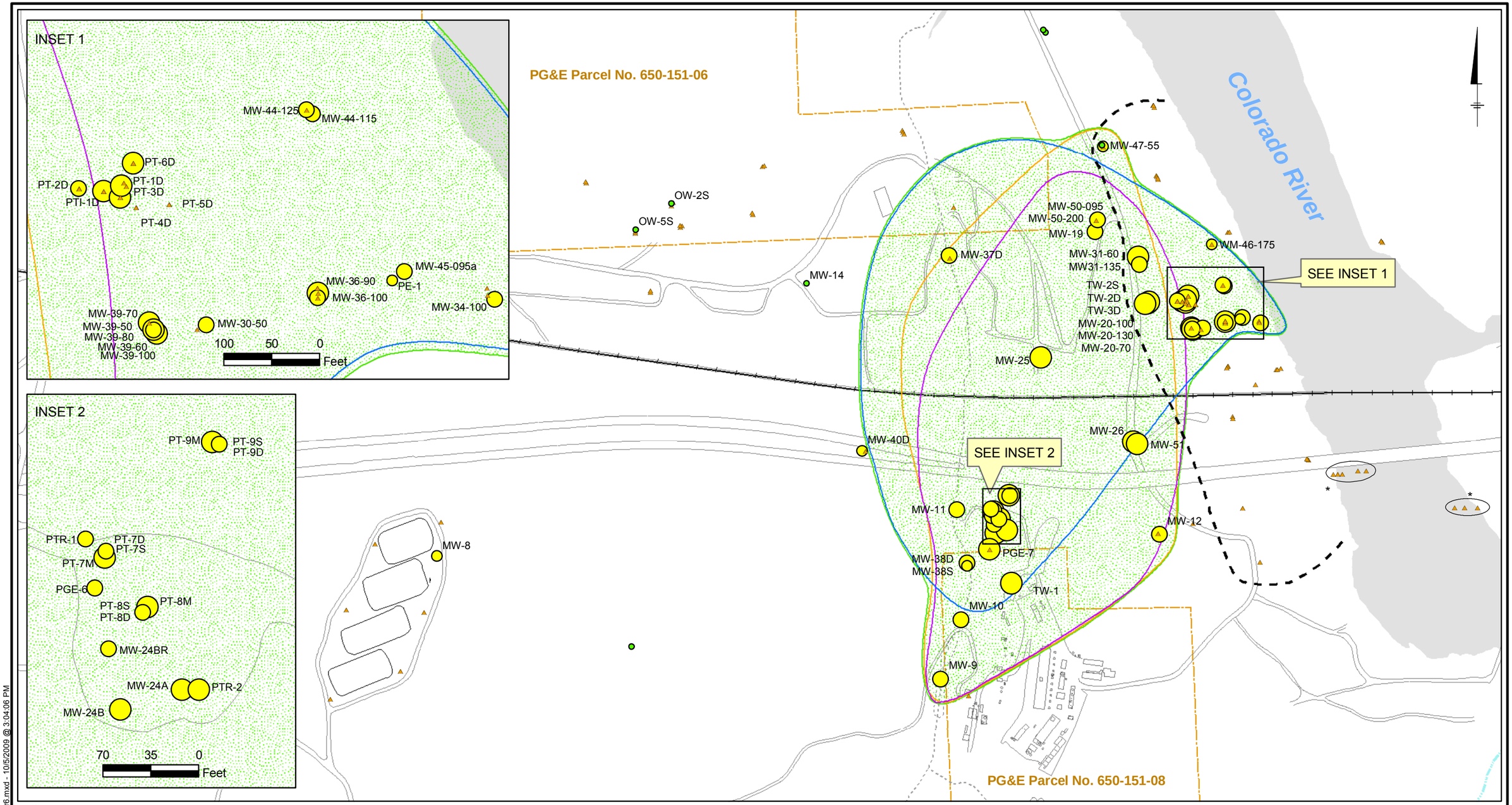
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ESTIMATED POTENTIAL NONCANCER HAZARD INDICES FOR ARSENIC: FUTURE HYPOTHETICAL CHILD GROUNDWATER USER

ARCADIS

FIGURE 7-11

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGE\Topock\GW_Risk\MXD\Fig_7-11_NHI-As.mxd - 9/10/2009 @ 5:28:39 PM



LEGEND:

Estimated Potential Noncancer Hazard Indices (HI) for[2]
Hexavalent Chromium: Future Hypothetical Child Groundwater User

- Not Sampled
- Not Detected
- ≤1.0
- 1.0 < HI ≤ 5.0
- 5.0 < HI ≤ 50
- 50 < HI
- Floodplain Zone[3]
- Hexavalent Chromium Plume[4]

Hexavalent Chromium plume from October 2007

- Shallow Wells
- Mid-Depth Wells
- Deep Wells
- PG&E Property Boundaries

NOTES:

1. Well identification labels are shown on this figure only for wells in which Hexvalent Chromium is contributing materially to the estimated cumulative noncancer hazard based on the analysis presented in Appendix P.
2. Hazard indices are indicated for all wells where the HI for Hexavalent Chromium exceeds the threshold HI of 1.0. See Table 7-2 for complete details.
3. Floodplain zone is defined as such for purposes of evaluating the groundwater-to-surface water transport pathway.
4. Hexavalent chromium plume shown is a superposition of three variable-depth plumes, each at a hexavalent chromium concentration of 50 ug/L, as defined in the RFI/RI Volume 2.
5. Wells denoted (*) are slant-drilled wells sampled beneath the Colorado River.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

ESTIMATED POTENTIAL NONCANCER HAZARD INDICES FOR HEXAVALENT CHROMIUM: FUTURE HYPOTHETICAL CHILD GROUNDWATER USER

ARCADIS

FIGURE **7-12**

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGE\Topock\GW_Risk\MXD\Fig_7-12_NHI-Cr6.mxd - 10/6/2009 @ 3:04:06 PM

ARCADIS

Appendix A

Groundwater Data Summary

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
CW-1D	02/07/2005	CW-1D	N	52 U	5 U	10 U	72.1	3 U	3 U	1 U	3 U	5 U	1 U	2.1 U	0.2 U	51.8	5 U	10 U	3 U	15 U	89.3	18.5
CW-1D	02/22/2005	CW-01D-002	N	50 U	3 U	5 U	69.3			1 U		5 U	1 U	5 U		49.9	5 U	5 U				20 U
CW-1D	09/15/2005	CW-01D-003	N	52 U	5 U	10 U	47.8	4.2 U	3 U	1.6	4.2 U	5 U	1 U	3.6	0.2 U	32.1	5.5	10 U	3 U	15 U	34.2	111
CW-1D	12/19/2005	CW-01D-006	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	1.1 J	2 U	0.2 U	27.9	20 U	5.2	5 U	1 U	12.2	29.1
CW-1D	06/06/2006	CW-01D-008	N	52 U	3 U	5 U	300 U	2.4	2 U	2.2	5 U	10 U	1.2	2 U	0.2 U	20.8	20 U	5 U	5 U	1 U	13.9	20 U
CW-1D	10/10/2006	CW-01D-010	N	52 U	3 U	5 U	300 U	1 U	2 U	1.3	5 U	10 U	1 U	2 U	0.2 U	34.7	20 U	5 U	5 U	2.1 U	5 U	20 U
CW-1D	05/02/2007	CW-01D-012	N	50 U	2 U	2.75	21	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	12.9	1.65	2.35	1 U	1 U	5.05	10 U
CW-1D	10/17/2007	CW-01D-014	N	118	2 U	2.32	20.3	1 U	1 U	1.05	1 U	1 U	0.2 U	1 U	0.2 U	12	1 U	2.17	1 U	1 U	4.16	113
CW-1M	02/08/2005	CW-1M	N	52 U	5 U	10 U	44.4	3 U	3 U	12.8	3 U	5 U	13.4	2.1 U	0.2 U	19.6	5 U	10 U	3 U	15 U	97.7	80.2
CW-1M	02/08/2005	CW-1M	N							12												
CW-1M	02/22/2005	CW-01M-002	N	50 U	3 U	5 U	50.9			15.8		5 U	14.9	5 U		20.1	5 U	5 U				20 U
CW-1M	09/15/2005	CW-01M-003	N	52 U	5 U	10 U	56.6	3 U	3 U	17.8	3 U	5 U	18.1	5.4	0.2 U	21.6	5 U	10 U	3 U	15 U	28.3	248
CW-1M	12/19/2005	CW-01M-006	N	52 U	3 U	5 U	300 U	1 U	2 U	17.4	5 U	10 U	17.2	2 U	0.2 U	18.1	20 U	5 U	5 U	1 U	12.9	20 U
CW-1M	12/19/2005	MW-92-006	FD	52 U	3 U	5 U	300 U	1 U	2 U	16.9	5 U	10 U	17.1	2 U	0.2 U	18.4	20 U	5 U	5 U	1 U	13.5	20 U
CW-1M	05/02/2006	CW-01M-CIS	N	50 U	2 U	2.22	69.6	1 U	1 U	17.1	1 U	1.21	15.1	1 U	0.2 U	23.9	1.73	1 U	1 U	1 U	4.19	10 U
CW-1M	10/11/2006	CW-01M-010	N	52 U	3 U	5 U	300 U	1 U	2 U	12.1	5 U	10 U	12.7	2 U	0.2 U	24.4	20 U	5 U	5 U	2.1 U	5 U	20 U
CW-1M	05/02/2007	CW-01M-012	N	50 U	2 U	2.28	86.2	1 U	1 U	8.08	1 U	1 U	6.9	1 U	0.2 U	21.6	1.87	1.6	1 U	1 U	3.74	10 U
CW-1M	10/17/2007	CW-01M-014	N	50 U	2 U	2.06	86.1	1 U	1 U	4.81	1 U	3.03	3.9 J	1 U	0.2 U	19.5	1 U	1.93	1 U	1 U	3.57	19
CW-2D	02/08/2005	CW-2D	N	52 U	5 U	10 U	76.6	3 U	3 U	1 U	3 U	5 U	1 U	2.1 U	0.2 U	50.1	5.6	10 U	3 U	15 U	121	52.2
CW-2D	02/23/2005	CW-02D-002	N	50 U	3 U	5 U	70.2			1 UJ		5 U	1 U	5 U		51.8	5 U	5 U				20 U
CW-2D	09/15/2005	CW-02D-003	N	52 U	5 U	10 U	44.9	4.2 U	4.2 U	1.6	4.2 U	5 U	1 U	4.2 U	0.2 U	41.6	5 U	10 U	4.2 U	15 U	42.2	26.2
CW-2D	12/05/2005	CW-02D-006	N	52 U	3 U	5 U	300 U	1 U	2.1 U	2.7	5 U	10 U	2 J	2 U	0.2 U	46.6	20 U	8.3 U	5 U	1 U	8.9	20 U
CW-2D	06/07/2006	CW-02D-008	N	52 U	3 U	5 U	300 U	2.4	2 U	3.1	5 U	10 U	3.3	2 U	0.2 U	33.9	20 U	5 U	5 U	1 U	17.5	20 U
CW-2D	10/11/2006	CW-02D-010	N	52 U	3 U	5 U	300 U	1 U	2 U	2.6	5 U	10 U	3	2 U	0.2 U	60	20 U	5 U	5 U	2.1 U	5 U	20 U
CW-2D	05/04/2007	CW-02D-012	N	50 U	2 U	3.9	15.2	1 U	1 U	4.31	1 U	3.47	1.8	1 U	0.2 U	73.2	1.42	2	1 U	1 U	5.45	10 U
CW-2D	10/18/2007	CW-02D-014	N	50 U	2 U	4.91	10.6	1 U	1 U	1.55	1 U	1.84	1 U	1 U	0.2 U	64.7	1 U	2.29	1 U	1 U	6.18	10 U
CW-2M	02/09/2005	CW-2M-001	N	52 U	5 U	10 U	68.4	3 U	3 U	11.6	3 U	5 U	13	2.1 U	0.2 U	29.2	5 U	10 U	3 U	15 U	116	33.2 J
CW-2M	02/09/2005	CW-2M-001	N							13.4												
CW-2M	02/09/2005	CW-90-001	FD	52 U	5 U	10 U	68	3 U	3 U	11.9	3 U	5 U	13.1	2.1 U	0.2 U	28	5 U	10 U	3 U	15 U	124	15.8 J
CW-2M	02/09/2005	CW-90-001	FD							13												
CW-2M	02/23/2005	CW-02M-002	N	50 U	3 U	5 U	59.6			18.6		5 U	14.6	5 U		26.7	5 U	5 U				20 U
CW-2M	09/15/2005	CW-02M-003	N	52 U	5 U	10 U	48.1	3 U	3 U	15.5	3 U	5 U	15.6	6.7	0.2 U	23.1	5 U	10 U	3 U	15 U	34.1	215 J
CW-2M	09/15/2005	MW-91-003	FD	52 U	5 U	10 U	45.3	3 U	3 U	14.7	3 U	5 U	15.8	4.9	0.2 U	21.1	5 U	10 U	3 U	15 U	30.7	20 UJ
CW-2M	12/06/2005	CW-02M-006	N	52 U	3 U	5 U	300 U	1 U	2 U	15.8	5 U	10 U	14.3	2 U	0.2 U	20.1	20 U	5 U	5 U	1 U	7.8	20 U
CW-2M	12/06/2005	MW-91-006	FD	52 U	3 U	5 U	300 U	1 U	2 U	16.1	5 U	10 U	13.5	2 U	0.2 U	20	20 U	5 U	5 U	1 U	7.4	27.2
CW-2M	05/02/2006	CW-02M-CIS	N	50 U	2 U	2.79	58.6	1 U	1 U	15.7	1 U	1 U	15.5	1 U	0.2 U	24.7	1 U	1 U	1 U	1 U	5.13	10 U

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
CW-2M	10/11/2006	CW-02M-010	N	52 U	3 U	5 U	300 U	1 U	2 U	14.3	5 U	10 U	15.6	2 U	0.2 U	25.4	20 U	5 U	5 U	2.1 U	5 U	20 U
CW-2M	05/04/2007	CW-02M-012	N	50 U	2 U	2.46	60	1 U	1 U	16	1 U	1 U	15.3	1 U	0.2 U	22.9	1.17	1 U	1 U	1 U	4.24	10 U
CW-2M	10/18/2007	CW-02M-014	N	50 U	2 U	2.35	60.9	1 U	1 U	15.1	1 U	2.61	14.5	1 U	0.2 U	23.3	1.5	1 U	1 U	1 U	4.17	10 U
CW-3D	02/08/2005	CW-3D	N	52 U	5 U	10 U	100	3 U	3 U	1 U	3 U	5 U	1 U	2.1 U	0.2 U	59	7.6	10 U	3 U	15 U	115	27.6
CW-3D	02/22/2005	CW-03D-002	N	50 U	3 U	5 U	119			1 U		5 U	1 U	5 U		59.9	5 U	5 U				20 U
CW-3D	09/16/2005	CW-03D-003	N	52 U	5 U	10 U	69.3	4.2 U	4.2 U	1 U	4.2 U	5 U	1 U	4.2 U	0.2 U	29.2	6.2	10 U	4.2 U	15 U	31.6	20.9 U
CW-3D	12/05/2005	CW-03D-006	N	52 U	3 U	5 U	300 U	1 U	2.1 U	2.5	5 U	10 U	2	2 U	0.2 U	38.6	20 U	8.3 U	5 U	1 U	6.6	20 U
CW-3D	06/07/2006	CW-03D-008	N	52 U	3 U	5 U	300 U	2.4	2 U	3.4	5 U	10 U	3.1	2 U	0.2 U	30	20 U	5 U	5 U	1.2	17.9	20 U
CW-3D	10/11/2006	CW-03D-010	N	52 U	3 U	5 U	300 U	1 U	2 U	2	5 U	10 U	2.5	2 U	0.2 U	52	20 U	5 U	5 U	2.1 U	5 U	20 U
CW-3D	05/02/2007	CW-03D-012	N	50 U	2 U	1.28	25	1 U	1 U	4.95	1 U	1 U	4.7	1 U	0.2 U	60.5	3.01	1 U	1 U	1 U	2.19	10 U
CW-3D	10/18/2007	CW-03D-014	N	50 U	2 U	1.72	12.7	1 U	1 U	2.63	1 U	1 U	2.5	1 U	0.2 U	88.2	1 U	1.84	1 U	1 U	2.75	10 U
CW-3M	02/10/2005	CW-3M-001	N	52 U	5 U	10 U	61.1	3 U	3 U	5.2	3 U	5 U	5.7	2.1 U	0.2 U	37.8	5	10 U	3 U	15 U	98.3	42.4
CW-3M	02/10/2005	CW-3M-001	N							6.4												
CW-3M	02/22/2005	CW-03M-002	N	50 U	3 U	5 U	54.3			7.7		5 U	6.3	5 U		34.2	5 U	5 U				20 U
CW-3M	09/16/2005	CW-03M-003	N	52 U	5 U	10 U	41.3	3 U	3 U	8.1	3 U	5 U	8.8	2.9	0.2 U	24.2	5.7	10 U	3 U	15 U	27.4	26.7
CW-3M	12/05/2005	CW-03M-006	N	52 U	3 U	5 U	300 U	1 U	2 U	10	5 U	10 U	10.6	2 U	0.2 U	23.4	20 U	5 U	5 U	1 U	6.4	61.7
CW-3M	06/07/2006	CW-03M-008	N	52 U	3 U	5 U	300 U	1.9	2 U	9.7	5 U	10 U	11.3	2 U	0.2 U	15.4	20 U	5 U	5 U	1 U	12.4	20 U
CW-3M	10/10/2006	CW-03M-010	N	52 U	3 U	5 U	300 U	1 U	2 U	9.4	5 U	10 U	11.3	2 U	0.2 U	20.1	20 U	5 U	5 U	2.1 U	5 U	20 U
CW-3M	05/02/2007	CIS-001	N	50 U	2 U	1.22	54.2	1 U	1 U	11.2	1 U	1 U	11.4	1 U	0.2 U	21.4	1 U	1 U	1 U	1 U	2.31	10 U
CW-3M	05/02/2007	MW-91-012	FD	50 U	2 U	1.3	53.7	1 U	1 U	11.4	1 U	1 U	11.4	1 U	0.2 U	21	1.21	1 U	1 U	1 U	2.43	10 U
CW-3M	10/18/2007	CW-03M-014	N	50 U	2 U	1.3	51.1	1 U	1 U	11.9	1 U	1.41	11.8	1 U	0.2 U	21.6	1 U	1 U	1 U	1 U	2.24	10 U
CW-4D	02/07/2005	CW-4D	N	52 U	5 U	10 U	74.1	3 U	3 U	1 U	3 U	5 U	1 U	2.1 U	0.2 U	39.1	5.6	10 U	3 U	15 U	109	25.7
CW-4D	02/23/2005	CW-04D-002	N	50 U	3 U	5 U	70.3			1 UJ		5 U	1 U	5 U		44.2	5 U	5 U				20 U
CW-4D	09/13/2005	CW-04D-003	N	52 U	5 U	10 U	37.5	3.1 U	3.1 U	1 U	3.1 U	15.4	1 U	5 U	0.2 U	26	5 U	10 U	3.1 U	15 U	7.9	32.3
CW-4D	12/06/2005	CW-04D-006	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	1 U	2 U	0.2 U	35.7	20 U	5 U	5 U	1 U	10.9	20 U
CW-4D	06/06/2006	CW-04D-008	N	52 U	3 U	5 U	300 U	2	2 U	2.4	5 U	10 U	2.6	2 U	0.2 U	21.8	20 U	5.3	5 U	1 U	14	20 U
CW-4D	10/11/2006	CW-04D-010	N	52 U	3 U	5 U	300 U	1 U	2 U	2.4	5 U	10 U	2.3	2 U	0.2 U	43.6	20 U	5 U	5 U	2.1 U	5 U	20 U
CW-4D	05/01/2007	CW-04D-012	N	50 U	2 U	3.42	32.9	1 U	1 U	3.6	1 U	1 U	2.8	1 U	0.2 U	42.5	1.6	1 U	1 U	1 U	2.84	10 U
CW-4D	10/18/2007	CW-04D-014	N	50 U	2 U	3.89	30.1	1 U	1 U	3.73	1 U	1 U	3.4	1 U	0.2 U	39.1	1 U	1.34	1 U	1 U	4.19	10 U
CW-4M	02/07/2005	CW-4M	N	52 U	5 U	10 U	69.9	3 U	3 U	9.2	3 U	5 U	11.1	2.1 U	0.2 U	11.5	5 U	10 U	3 U	15 U	95.3	31.6
CW-4M	02/07/2005	CW-4M	N							10.5												
CW-4M	02/23/2005	CW-04M-002	N	50 U	3 U	5 U	67.4			14.9		5 U	15.6	5 U		12.3	5 U	5 U				20 U
CW-4M	09/13/2005	CW-04M-003	N	52 U	5 U	10 U	69.7	3.1 U	3.1 U	19	3.1 U	21.8	19.2	5.5	0.2 U	12.3	5 U	10 U	3.1 U	15 U	10.3	31.5
CW-4M	12/06/2005	CW-04M-006	N	52 U	3 U	5 U	300 U	1 U	2 U	2.4	5 U	10 U	0.2 U	2 U	0.2 U	31	20 U	5 U	5 U	1 U	8.1	20 U
CW-4M	06/06/2006	CW-04M-008	N	52 U	3 U	5 U	300 U	1.6	2 U	19.9	5 U	10 U	21.4	2 U	0.2 U	7.3	20 U	5 U	5 U	1 U	11.1	20 U
CW-4M	10/11/2006	CW-04M-010	N	52 U	3 U	5 U	300 U	1 U	2 U	16.8	5 U	10 U	21.2	2 U	0.2 U	16	20 U	5 U	5 U	2.1 U	5 U	20 U

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
CW-4M	05/01/2007	CIS-007	N	50 U	2 U	2.46	75.8	1 U	1 U	21.8	1 U	1 U	20.8	1 U	0.2 U	11.3	2.19	1.04	1 U	1 U	3.4	10 U
CW-4M	10/18/2007	CW-04M-014	N	50 U	2 U	2.7	71.8	1 U	1 U	20.7	1 U	3.48	20.7	1 U	0.2 U	11.5	1 U	1.02	1 U	1 U	3.96	10 U
CW-4M	10/18/2007	MW-91-014	FD	50 U	2 U	2.69	73.7	1 U	1 U	21.7	1 U	3.89	21	1 U	0.2 U	12.1	1 U	1.1	1 U	1 U	4.01	10 U
MW-1	07/26/1997	07-26-1997_MW-1	N							230												
MW-1	09/01/1997	MW-1_09/01/1997	N							20 U		10 U	10 U				10 J					4 J
MW-1	10/28/1997	MW-1_10/28/1997_LS	N							0 U												
MW-1	02/18/1998	MW-1_02/18/1998	N							11 J		7.9 J	10 U				23 J					3.3 J
MW-1	05/14/1998	MW-1_5/14/1998_LS	N							11												
MW-1	06/15/1998	MW-1_06/15/1998	N							20 U		10 U	10 U				25 U					6.1
MW-1	11/10/1998	MW-1_11/10/1998_LS	N													5.9						
MW-1	04/06/1999	MW-1_4/6/1999_LS	N													5 U						
MW-1	11/30/1999	MW-1_11/30/1999_LS	N													5 U						
MW-1	04/18/2000	MW-1_4/18/2000_LS	N													50 U						
MW-1	11/14/2000	MW-1_11/14/2000_LS	N													5 U						
MW-1	04/17/2001	MW-1_4/17/2001_LS	N													5 U						
MW-1	10/30/2001	MW-1_10/30/2001_LS	N													78						
MW-1	05/21/2002	MW-1_5/21/2002_LS	N													5 U						
MW-1	12/12/2002	MW-1_12/12/2002_LS	N													5 U						
MW-1	05/13/2003	MW-1_5/13/2003_LS	N													5.7						
MW-1	11/04/2003	MW-1-008	N							3.1			4.5									
MW-1	11/04/2003	MW-91-008	FD							4			4.6									
MW-1	05/09/2005	MW-01-BKG-001	N	50 U	2 U	13.2	20.8	1 U	1 U	5.7	1 U	2.72	4.8	1 U	0.2 U	2 U	7.79	3.48	1 U	1 U	36.9	10 U
MW-1	07/18/2005	MW-01-BKG-002	N	68.6	2 U	13.3	26.3	1 U	1 U	6.98	1 U	1.55	4.7	1 U	0.2 U	2 U	6.71	3.34	1 U	1 U	40.6	72.8
MW-3	07/26/1997	07-26-1997_MW-3	N							1200												
MW-3	07/26/1997	07-26-1997_MW-3D	FD							500												
MW-3	09/01/1997	MW-3_09/01/1997	N							20		10 U	10				42					60
MW-3	09/01/1997	MW-3D_09/01/1997	FD							16 J		10 U	10				24 J					16
MW-3	10/28/1997	MW-3_10/28/1997	N							190												
MW-3	02/18/1998	MW-3_02/18/1998	N							16 J		10 U	10 U				23 J					5 U
MW-3	02/18/1998	MW-3D_02/18/1998	FD							17 J		4.4 J	10				24 J					5 U
MW-3	05/14/1998	MW-3_5/14/1998	N							0 U												
MW-3	06/15/1998	MW-3_06/15/1998	N							14 J		10 U	10				30					21
MW-3	06/15/1998	MW-3D_06/15/1998	FD							14 J		10 U	10				31					5.3
MW-3	11/11/1998	MW-3_11/11/1998	N													32						
MW-3	04/06/1999	MW-3_4/6/1999_LS	N													30						
MW-3	11/30/1999	MW-3_11/30/1999_LS	N													36						

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-3	04/18/2000	MW-3_4/18/2000_LS	N													50 U						
MW-3	11/14/2000	MW-3_11/14/2000_LS	N													29						
MW-3	04/17/2001	MW-3_4/17/2001	N													25						
MW-3	10/30/2001	MW-3_10/30/2001_LS	N													41						
MW-3	05/21/2002	MW-3_5/21/2002_LS	N													29						
MW-3	12/12/2002	MW-3_12/12/2002_LS	N													39						
MW-3	05/13/2003	MW-3_5/13/2003_LS	N													29						
MW-3	11/04/2003	MW-3-008	N							9.9			11.7									
MW-3	05/09/2005	MW-03-BKG-001	N	50 U	2 U	10.3	14.1	1 U	1 U	12.4	1 U	4.07	9.9	1 U	0.2 U	29.3	41.5	8.84	1 U	1 U	30.8	27.6
MW-3	07/18/2005	MW-03-BKG-002	N	63.6	2 U	11.9	15.9	1 U	1 U	12.5	1 U	4.85	10.2	1 U	0.2 U	26.6	12.5	8.089999	1 U	1 U	37.4	10 U
MW-4	07/26/1997	07-26-1997_MW-4	N							83												
MW-4	09/01/1997	MW-4_09/01/1997	N							36		10 U	21				17 J					7.6
MW-4	10/28/1997	MW-4_10/28/1997_LS	N							35												
MW-4	02/18/1998	MW-4_02/18/1998	N							22		4.5 J	22				22 J					5 U
MW-4	05/14/1998	MW-4_5/14/1998_LS	N							47												
MW-4	06/15/1998	MW-4_06/15/1998	N							21		3 J	20				21 J					11
MW-4	11/10/1998	MW-4_11/10/1998_LS	N													16						
MW-4	04/06/1999	MW-4_4/6/1999_LS	N													15						
MW-4	11/30/1999	MW-4_11/30/1999	N													18						
MW-4	04/18/2000	MW-4_4/18/2000_LS	N													50 U						
MW-4	11/14/2000	MW-4_11/14/2000	N													15						
MW-4	04/17/2001	MW-4_4/17/2001_LS	N													16						
MW-4	10/30/2001	MW-4_10/30/2001	N													18						
MW-4	05/21/2002	MW-4_5/21/2002_LS	N													24						
MW-4	12/12/2002	MW-4_12/12/2002_LS	N													14						
MW-4	05/13/2003	MW-4_5/13/2003_LS	N													22						
MW-4	11/04/2003	MW-4-008	N							18.7			20.2									
MW-4	05/09/2005	MW-04-BKG-001	N	50 U	2 U	5.44	16.1	1 U	1 U	22.9	1 U	2.75	19.1	1 U	0.2 U	15.8	7.74	3.42	1 U	1 U	21.1	18
MW-4	07/18/2005	MW-04-BKG-002	N	61.8	2 U	6.07	17.6	1 U	1 U	24	1 U	2.27	19.2	1 U	0.2 U	18.2	13.2	3.91	1 U	1 U	23.6	12.8
MW-5	07/26/1997	07-26-1997_MW-5	N							150												
MW-5	09/01/1997	MW-5_09/01/1997	N							17 J		10 U	10				13 J					9
MW-5	10/28/1997	MW-5_10/28/1997_LS	N							23												
MW-5	02/18/1998	MW-5_02/18/1998	N							24		10 U	20				20 J					5 U
MW-5	05/14/1998	MW-5_5/14/1998_LS	N							71												
MW-5	06/15/1998	MW-5_06/15/1998	N							16 J		10 U	10				16 J					4.4 J
MW-5	11/11/1998	MW-5_11/11/1998_LS	N													150						

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-5	04/06/1999	MW-5_4/6/1999	N													39						
MW-5	11/30/1999	MW-5_11/30/1999_LS	N													41						
MW-5	04/18/2000	MW-5_4/18/2000	N													50 U						
MW-5	11/14/2000	MW-5_11/14/2000_LS	N													39						
MW-5	04/17/2001	MW-5_4/17/2001_LS	N													41						
MW-5	10/30/2001	MW-5_10/30/2001_LS	N													43						
MW-5	05/21/2002	MW-5_5/21/2002	N													39						
MW-5	12/12/2002	MW-5_12/12/2002	N													40						
MW-5	05/13/2003	MW-5_5/13/2003_LS	N													53						
MW-5	11/04/2003	MW-5-008	N							11.7			13.2									
MW-5	05/13/2005	MW-05-BKG-001	N	50 U	2 U	5.73	27.8	1 U	1 U	12.9	1 U	2.83	12.3	1 U	0.2 U	45.2	6.46 U	17.3	1 U	1 U	20.1	32.1 U
MW-5	07/18/2005	MW-05-BKG-002	N	58.5	2 U	7.34	29.7	1 U	1 U	15	1 U	2.04	12.6	1 U	0.2 U	50.4	4.97	20.3	1 U	1 U	23.5	36.7
MW-6	07/26/1997	07-26-1997_MW-6	N							31												
MW-6	09/01/1997	MW-6_09/01/1997	N							14 J		10 U	10				25 U					6.6
MW-6	10/28/1997	MW-6_10/28/1997_LS	N							0 U												
MW-6	02/18/1998	MW-6_02/18/1998	N							20 U		10 U	10				25 U					5 U
MW-6	05/14/1998	MW-6_5/14/1998_LS	N							13												
MW-6	06/15/1998	MW-6_06/15/1998	N							10 J		10 U	10				25 U					5 U
MW-6	11/10/1998	MW-6_11/10/1998_LS	N													22						
MW-6	04/06/1999	MW-6_4/6/1999_LS	N													6.7						
MW-6	11/30/1999	MW-6_11/30/1999_LS	N													7.9						
MW-6	04/18/2000	MW-6_4/18/2000_LS	N													50 U						
MW-6	11/14/2000	MW-6_11/14/2000_LS	N													5.5						
MW-6	04/17/2001	MW-6_4/17/2001_LS	N													6.3						
MW-6	10/30/2001	MW-6_10/30/2001_LS	N													6.8						
MW-6	05/21/2002	MW-6_5/21/2002_LS	N													6.9						
MW-6	12/12/2002	MW-6_12/12/2002_LS	N													6.6						
MW-6	05/13/2003	MW-6_5/13/2003	N													10						
MW-6	11/04/2003	MW-6-008	N							8.5			9									
MW-6	05/13/2005	MW-06-BKG-001	N	50 U	2 U	14.2	10.2	1 U	1 U	7.98	1 U	1.89	7	1 U	0.2 U	5.61	2.88 U	1.44	1 U	1 U	44.1	27.4 U
MW-6	07/18/2005	MW-06-BKG-002	N	61.8	2 U	15.7	9.17	1 U	1 U	9.030001	1 U	1.48	7.2	1 U	0.2 U	5.68	1.44	1.31	1 U	1 U	47.2	37.8
MW-7	07/26/1997	07-26-1997_MW-7	N							190												
MW-7	09/01/1997	MW-7_09/01/1997	N							19 J		10 U	20				13 J					18
MW-7	10/28/1997	MW-7_10/28/1997_LS	N							36												
MW-7	02/18/1998	MW-7_02/18/1998	N							22		10 U	10				20 J					5 U
MW-7	05/14/1998	MW-7_5/14/1998_LS	N							26												

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-7	06/15/1998	MW-7_06/15/1998	N							18 J		10 U	10				11 J					7.6
MW-7	11/10/1998	MW-7_11/10/1998_LS	N													24						
MW-7	04/06/1999	MW-7_4/6/1999_LS	N													19						
MW-7	11/30/1999	MW-7_11/30/1999_LS	N													26						
MW-7	04/18/2000	MW-7_4/18/2000_LS	N													50 U						
MW-7	11/14/2000	MW-7_11/14/2000_LS	N													19						
MW-7	04/17/2001	MW-7_4/17/2001_LS	N													17						
MW-7	10/30/2001	MW-7_10/30/2001_LS	N													21						
MW-7	05/21/2002	MW-7_5/21/2002_LS	N													17						
MW-7	12/12/2002	MW-7_12/12/2002_LS	N													20						
MW-7	05/13/2003	MW-7_5/13/2003_LS	N													21						
MW-7	11/04/2003	MW-7-008	N							13.4			15.9									
MW-7	05/13/2005	MW-07-BKG-001	N	50 U	2 U	11.1	15.2	1 U	1 U	14.9	1 U	1.19	14.6	1 U	0.2 U	17.1	8.03	6.95	1 U	1 U	33	16.1 U
MW-7	07/18/2005	MW-07-BKG-002	N	53.5	2 U	13.8	17.8	1 U	1 U	18.2	1 U	1.3	14.7	1 U	0.2 U	20.4	5.29	7.47	1 U	1 U	38.7	12.4
MW-8	07/26/1997	07-26-1997_MW-8	N							62												
MW-8	09/01/1997	MW-8_09/01/1997	N							51		10 U	46				10 J					12
MW-8	10/28/1997	MW-8_10/28/1997_LS	N							57												
MW-8	02/18/1998	MW-8_02/18/1998	N							54		10 U	43				15 J					5 U
MW-8	05/14/1998	MW-8_5/14/1998_LS	N							100												
MW-8	06/15/1998	MW-8_06/15/1998	N							33		10 U	20				16 J					7
MW-8	11/11/1998	MW-8_11/11/1998_LS	N													22						
MW-8	04/06/1999	MW-8_4/6/1999_LS	N													16						
MW-8	11/30/1999	MW-8_11/30/1999_LS	N													21						
MW-8	04/18/2000	MW-8_4/18/2000_LS	N													50 U						
MW-8	11/14/2000	MW-8_11/14/2000_LS	N													18						
MW-8	04/17/2001	MW-8_4/17/2001_LS	N													16						
MW-8	10/30/2001	MW-8_10/30/2001_LS	N													19						
MW-8	05/21/2002	MW-8_5/21/2002_LS	N													14						
MW-8	12/12/2002	MW-8_12/12/2002_LS	N													20						
MW-8	05/13/2003	MW-8_5/13/2003_LS	N													18						
MW-8	11/04/2003	MW-8-008	N							67.9			50.9									
MW-8	05/13/2005	MW-08-BKG-001	N	50 U	2 U	4.64	29.1	1 U	1 U	48.7	1 U	2.11	47	1 U	0.2 U	18.5	5.49 U	6.07	1 U	1 U	18.3	13.7 U
MW-8	07/18/2005	MW-08-BKG-002	N	50 U	2 U	6.21	32.1	1 U	1 U	56.3	1 U	11.4	49	1 U	0.2 UJ	19.5	2.46	6.67	1 U	1 U	22.6	72.7
MW-9	07/01/1997	MW-9_07/01/1997	N				73			290		11	344	2 J		5.3	25 U				10 U	18
MW-9	07/01/1997	MW-9_07/01/1997	N				70			270		10 U		2 U		10 U	10 U				8	11
MW-9	07/01/1997	MW-9D_07/01/1997	FD							280		10	296				25 U					25

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-9	07/01/1997	MW-9D_07/01/1997	FD							260		10 U	310				25 U					11
MW-9	09/01/1997	MW-9_09/01/1997	N							330		4 J	338				18 J					20
MW-9	02/18/1998	MW-9_02/18/1998	N							340		10 U	355				25 U					10
MW-9	06/15/1998	MW-9_06/15/1998	N							360		3.4 J	362				25 U					3.4 J
MW-9	06/15/1999	MW-9_06/15/1999	N							360		10 U	339				25 U					16
MW-9	09/14/1999	MW-9_09/14/1999	N							380		6 J	364				10.1 J					111
MW-9	12/01/1999	MW-9_12/01/1999	N							380		6.1 J	331				5					13
MW-9	03/25/2000	MW-9_03/25/2000	N							350		5.7 J	367				2.4 J					12
MW-9	06/14/2000	MW-9_06/14/2000	N							320		2.5 J	343				2.3 J					9.6 J
MW-9	09/01/2000	MW-9_09/01/2000	N				63			330		2.4 J	352	5 U		5 U	3.2 J				9.4 J	14
MW-9	12/01/2000	MW-9_12/01/2000	N							340		6.1 J	353				2.8 J					37
MW-9	03/28/2001	MW-9_03/28/2001	N							310		4 J	340				3 J					12
MW-9	06/06/2001	MW-9_06/06/2001	N							310		10 U	330				1.8 J					7.8 J
MW-9	09/12/2001	MW-9_09/12/2001	N							320		4.6 J	340				1.5 J					31
MW-9	11/28/2001	MW-9_11/28/2001	N				60			340		3.8 J	360	5 U		1.4 J	1.4 J				7.7 J	21
MW-9	03/06/2002	MW-09-001_03/06/2002	N									5.2 J	354				10.1					127
MW-9	06/12/2002	MW-9-002_6/12/02	N							345		10 U	347				7.6					62.6
MW-9	09/17/2002	MW-9-003	N							401		55.5 U	360				5.6 U					248
MW-9	12/10/2002	MW-9_12/10/02_LS	N							428		20 U	402				27.8 U					255
MW-9	03/18/2003	MW-9-005	N							357		14.6	368				27.8 U					363
MW-9	06/12/2003	MW-9-006	N				500 U			349		10 U	343				29.7					361
MW-9	09/11/2003	MW-9-007	N							340		16.7	376				26.1 U					140
MW-9	12/12/2003	MW-9-009	N							460		10 U	357				20 U					24.7
MW-9	03/16/2004	MW-9-018	N							297		14	342				20 U					71.8
MW-9	06/09/2004	MW-9-030	N				56			334		10.4 U	359				20 U					82 U
MW-9	09/21/2004	MW-09-043	N							333			265									
MW-9	12/17/2004	MW-09-049	N	52 U	5 U	10 U	61.5	3.1 U	3.1 U	294	3.1 U	5 U		2.1 U	0.2 U	5 U	5 U	13.2	5.9	15 U	14	70
MW-9	12/17/2004	MW-09-049	N							306												
MW-9	01/11/2005	MW-09-049R	N										279									
MW-9	03/08/2005	MW-09-056	N							316			343									
MW-9	04/07/2005	MW-09-060	N							318			338									
MW-9	06/16/2005	MW-09-070	N							304			320									
MW-9	06/16/2005	MW-90-070	FD							298			322									
MW-9	10/03/2005	MW-09-081	N							287			309									
MW-9	03/07/2006	MW-09-093	N							291			298									
MW-9	03/07/2006	MW-90-093	FD							295			301									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-9	10/12/2006	MW-09-110	N							306			308									
MW-9	05/03/2007	CIS-003	N			1.9	52.2			341		4.06	286	3.17		2 U	2.31	6.22			12.3	19.1
MW-9	10/04/2007	MW-09-136	N							304			304									
MW-10	07/01/1997	MW-10_07/01/1997	N				180			1100		18	992	8		130	11 J				37	31
MW-10	07/01/1997	MW-10D_07/01/1997	FD							1200		26	1240				15 J					55
MW-10	09/01/1997	MW-10_09/01/1997	N							790		6 J	755				33					19
MW-10	02/18/1998	MW-10_02/18/1998	N							860		10 U	867				25 U					9
MW-10	06/15/1998	MW-10_06/15/1998	N							1200		10 U	1280				25 U					5 UJ
MW-10	06/15/1999	MW-10_06/15/1999	N							2100		10 U	1890				25 U					19
MW-10	09/14/1999	MW-10_09/14/1999	N							3600		10 U	3470				25 U					5.3
MW-10	12/01/1999	MW-10_12/01/1999	N							2700		2.6 J	2380				6.5					7.8 J
MW-10	03/25/2000	MW-10_03/25/2000	N							2000		2.9 J	2180				4.9 J					9.8 J
MW-10	06/14/2000	MW-10_06/14/2000	N							1900		4 J	2030				3.5 J					12
MW-10	09/01/2000	MW-10_09/01/2000	N				46			2300		2.8 J	2490	5 U		190	6				40	6.1 J
MW-10	12/01/2000	MW-10_12/01/2000	N							1900		3.4 J	1970				3.7 J					21
MW-10	03/28/2001	MW-10_03/28/2001	N							1500		10 U	1500				2.6 J					6.4 J
MW-10	06/06/2001	MW-10_06/06/2001	N							1700		10 U	1840				3.7 J					10
MW-10	09/12/2001	MW-10_09/12/2001	N							1800		3.1 J	2000				3.3 J					11
MW-10	11/28/2001	MW-10_11/28/2001	N				25			1400		3.1 J	1900	5 U		95	1.7 J				20	26
MW-10	03/06/2002	MW-10-001_03/06/2002	N									4.2	1870				5.9					59.3
MW-10	06/12/2002	MW-10-002_6/12/02	N							1750		10 U	2000				5 U					40.8
MW-10	09/17/2002	MW-10-003	N							2330		20 U	2070				14.1					177
MW-10	12/10/2002	MW-10_12/10/02_LFD	FD							1790		20 U	1970				27.8 U					200 J
MW-10	12/10/2002	MW-10_12/10/02_LS	N							2150		20 U	1930				27.8 U					119 J
MW-10	03/18/2003	MW-10-005	N							1470		11 U	1640				27.8 U					637
MW-10	06/12/2003	MW-10-006	N				500 U			1750		10 U	1650				26.1 U					445
MW-10	09/11/2003	MW-10-007	N							1750		11 U	1920				26.1 U					92.8
MW-10	12/12/2003	MW-10-009	N							4200		10 U	1920				20 U					25.2
MW-10	03/16/2004	MW-10-018	N							1110		10 U	1350				20 U					63.7
MW-10	06/10/2004	MW-10-030	N		4.2 U					1300		10.4 U	1390		0.5 U		20 U					28.9 U
MW-10	09/21/2004	MW-10-043	N	500 U	5 U	10 U	45.8	3 U	3 U	1960	3 U	6.4	1560	5 U	0.2 U	115	5 U	10 U	3 U	15 U	25.2	22.7
MW-10	09/21/2004	MW-10-043	N							1630												
MW-10	12/17/2004	MW-10-049	N	64.5	5 U	10 U	44.9	3.1 U	3.1 U	1300	3.1 U	5 U		2.1 U	0.2 U	100	5 U	10 U	61.8	15 U	40	54.9
MW-10	12/17/2004	MW-10-049	N							1320												
MW-10	01/11/2005	MW-10-049R	N										1210									
MW-10	03/08/2005	MW-10-056	N	52 U	5 U	10 U	42	3.1 U	3.1 U	1020	3.1 U	5 U	1140	2.1 U	0.2 U	83.3	5 U	10 U	3.1 U	15 U	141	56.2

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-10	03/08/2005	MW-10-056	N							1110												
MW-10	03/08/2005	MW-90-056	FD	55.9	5 U	10 U	49.3	3.1 U	3.1 U	1020	3.1 U	5 U	1030	2.1 U	0.2 U	81.1	5 U	10 U	3.1 U	15 U	165	65.6
MW-10	03/08/2005	MW-90-056	FD							1100												
MW-10	06/16/2005	MW-10-070	N	50 U	2 U	6.39	45.5	1 U	1 U	1400	1 U	1 U	1490	1.53	0.2 U	114	1.7	4.9	1 U	1 U	33.5	10 U
MW-10	06/16/2005	MW-10-070	N							1210												
MW-10	10/03/2005	MW-10-081	N		2 U	14.3	300 U	1 U	1 U	4900	1 U	10.4 U	4570	1.53	0.2 U	301	20 U	1.93	1 U	1 U	49.7	79.4
MW-10	12/12/2005	MW-10-087	N	52 U	3 U	5 U	300 U	1 U	2 U	3040	5 U	10 U		2 U	0.2 U	168	20 U	5 U	5 U	1 U	40.2	20 U
MW-10	03/06/2006	MW-10-093	N		2 U	8.45	59.5	1 U	1 U	2120	1 U	1.21	2070	1 U	0.2 U	142	2.31	3.64	1 U	1 UJ	41.3	10.1
MW-10	05/04/2006	MW-10-CIS	N	50 U	2 U	8.31	58.1	1 U	1 U	1780	1 U	1.18	1610	1.06	0.2 U	122	1.96	3.91	1 U	1 U	37.9	10 U
MW-10	10/12/2006	MW-10-110	N		2 U	9.2	58.4	1 U	1 U	2480	1 U	1 U	2510	1 U	0.2 U	169	2.31	3.64	1 U	1 U	42.1	10 U
MW-10	12/14/2006	MW-10-115	N		2 U	11.7	53.4	1 U	1 U	3040	1 U	1.3	2380	1.26	0.2 U	245	2.05	3.25	1 U	1 U	51.4	10 U
MW-10	03/06/2007	MW-10-121	N		2 U	7.77	60.9	1 U	1 U	1700	1 U	1 U	1640	1 U	0.2 U	130	1.65	4.06	1 U	1 U	36.1	10 U
MW-10	05/03/2007	MW-10-125	N		2 U	8.18	54.4	1 U	1 U	1440	1 U	2.3	1230	1.89	0.2 U	120	2.55	4.54	1 U	1 U	35.2	10 U
MW-10	10/02/2007	MW-10-136	N	3.3	2 U	45	1 U	1 U	1050	3 U	8.4	1010	5 U	0.2 U	80	5 U	20	3 U	2 U	28	10 U	
MW-10	03/11/2008	MW-10-141	N	3 U	5 U	300 U	1 U	2 U	473	5 U	10 U		2 U	0.2 U	68.3	20 U	5.17	5 U	1 U	29.8	20 U	
MW-11	07/01/1997	MW-11_07/01/1997	N			220			70		19	20	6		35	14 J				24	40	
MW-11	09/01/1997	MW-11_09/01/1997	N						450		4 J	466				12 J					7	
MW-11	02/18/1998	MW-11_02/18/1998	N						960		10 U	1010				25 U					5 U	
MW-11	06/15/1998	MW-11_06/15/1998	N						1700		3.6 J	1710				25 U					7 J	
MW-11	06/15/1999	MW-11_06/15/1999	N						820		10 U	822				25 U					24	
MW-11	09/14/1999	MW-11_09/14/1999	N						1400		10 U	1390				25 U					5.3	
MW-11	12/01/1999	MW-11_12/01/1999	N						1300		5.8 J	1310				4.7 J					10	
MW-11	03/25/2000	MW-11_03/25/2000	N						820		11	959				6.7					17	
MW-11	06/14/2000	MW-11_06/14/2000	N						560		2 J	491				5.9					8.1 J	
MW-11	09/01/2000	MW-11_09/01/2000	N			46			720		10 U	747	5 U		10	3.8 J				6.1 J	10	
MW-11	12/01/2000	MW-11_12/01/2000	N						890		4.3 J	914				2 J					17	
MW-11	03/28/2001	MW-11_03/28/2001	N						680		10 U	710				1.5 J					5.9 J	
MW-11	06/06/2001	MW-11_06/06/2001	N						460		3.6 J	468				2.8 J					18	
MW-11	09/12/2001	MW-11_09/12/2001	N						460		3.4 J	460				3.8 J					24	
MW-11	11/28/2001	MW-11_11/28/2001	N			28			540		400 U	730	0.83 J		7.2	0.96 J				3.6 J	14	
MW-11	03/06/2002	MW-11-001_03/06/2002	N								5 J	613				8.8					52.3	
MW-11	06/12/2002	MW-11-002_6/12/02	N						371		10 U	459				6.2					32.2	
MW-11	09/17/2002	MW-11-003	N						483		27.8 U	408				15.7					443 J	
MW-11	09/17/2002	MW-40-003	FD						467		27.8 U	409				5.6 U					208 J	
MW-11	12/10/2002	MW-11_12/10/02_LS	N						696		20 U	584				27.8 U					176	
MW-11	03/18/2003	MW-11-005	N						452		11 U	463				27.8 U					329	

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-11	06/12/2003	MW-11-006	N				500 U			453		10 U	429				20.3 J					399
MW-11	06/12/2003	MW-41-006	FD				500 U			435		10 U	415				26.1 U					450
MW-11	09/11/2003	MW-11-007	N							376		11 U	412				26.1 U					62.7
MW-11	12/12/2003	MW-11-009	N							772		10 U	566				20 U					20 U
MW-11	03/16/2004	MW-11-018	N							358		10 U	432				20 U					69.3
MW-11	06/10/2004	MW-11-030	N		4.7 U					394		10.4 U	424		0.5 U		20 U					21.4 U
MW-11	09/21/2004	MW-11-043	N	500 U	5 U	10 U	45.1	3 U	3 U	390	3 U	5 U	320	5 U	0.2 U	8.8	5 U	10 U	3 U	15 U	5.8	10.4 U
MW-11	09/21/2004	MW-11-043	N							431												
MW-11	12/17/2004	MW-11-049	N	52 U	5 U	10 U	38.8	3.1 U	3.1 U	393	3.1 U	5 U		2.1 U	0.2 U	9.4	5 U	13.6	3.1 U	15 U	9.9	27.4
MW-11	12/17/2004	MW-11-049	N							387												
MW-11	01/11/2005	MW-11-049R	N										323									
MW-11	03/08/2005	MW-11-056	N	52 U	5 U	10 U	38.3	3.1 U	3.1 U	357	3.1 U	5 U	396	2.1 U	0.2 U	9	5 U	10 U	3.1 U	15 U	85.9	56.7
MW-11	03/08/2005	MW-11-056	N							392												
MW-11	06/16/2005	MW-11-070	N	50 U	2 U	1.53	42.1	1 U	1 U	334	1 U	1 U	362	1 U	0.2 U	11.5	1.03	4.5	1 U	1 U	8.31	13.4
MW-11	06/16/2005	MW-11-070	N							379												
MW-11	10/03/2005	MW-11-081	N		2 U	1.68	300 U	1 U	1 U	617	1 U	10.4 U	649	1 U	0.2 U	16.4	20 U	5.31	1 U	1 U	6.3	20 U
MW-11	12/12/2005	MW-11-087	N	52 U	3 U	5 U	300 U	1 U	2 U	449	5 U	10 U		2 U	0.2 U	9.4	20 U	5 U	5 U	1 U	8.3	20 U
MW-11	03/06/2006	MW-11-093	N		2 U	1.64	39.8	1 U	1 U	306	1 U	1.22	323	1 U	0.2 U	8.08	1 U	5.79	1 U	1 U	8.940001	12.1
MW-11	05/09/2006	MW-11-098	N		2 U	1.72	39.5	1 U	1 U	348 J	1 U	1 U		1 U	0.2 U	9.28	1 U	5.73	1 U	1 U	8.759999	10 U
MW-11	10/12/2006	MW-11-110	N		2 U	1.65	41.4	1 U	1 U	339	1 U	1 U	325	1 U	0.2 U	8.809999	1 U	6.17	1 U	1 U	8.71	10 U
MW-11	05/03/2007	CIS-021	N			1.54	36.9			321		1.28	350	1.17		8.940001	1 U	5.61			7.43	10 U
MW-11	05/03/2007	CIS-089	FD			1.64	37.2			337		2.29	356	1.23		8.82	1 U	5.71			7.880001	10 U
MW-11	07/17/2007	MW-11_071707	N			5 U				314			321									
MW-12	07/01/1997	MW-12_07/01/1997	FD							360		7.8 J	387				25 U					17
MW-12	07/01/1997	MW-12_07/01/1997	FD							340		6.5 J	385				25 U					16
MW-12	07/01/1997	MW-12_07/01/1997	N				34			350		8.3 J	391	1 J		87	25 U				34	7.7
MW-12	09/01/1997	MW-12_09/01/1997	N							440		4 J	443				15 J					34
MW-12	02/17/1998	MW-12_02/17/1998	N							630		3 J	679				25 U					16
MW-12	06/15/1998	MW-12_06/15/1998	N							390		4.9 J	392				5.3 J					11 J
MW-12	06/15/1999	MW-12_06/15/1999	N							450		10 U	449				25 U					4.6 J
MW-12	09/14/1999	MW-12_09/14/1999	N							470		3.4 J	430				25 U					9.6
MW-12	09/14/1999	MW-12D_09/14/1999	FD							470		10 U	414				25 U					9.4
MW-12	12/01/1999	MW-12_12/01/1999	N							340		6.9 J	311				1.3 J					7.7 J
MW-12	03/25/2000	MW-12_03/25/2000	N							560		4 J	638				3.8 J					19
MW-12	06/15/2000	MW-12_06/15/2000	N							940		18	956				2.3 J					18
MW-12	09/01/2000	MW-12_09/01/2000	N				52			950		1.3 J	940	5 U		65	3 J				25	10

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-12	12/01/2000	MW-12_12/01/2000	N							980		3.1 J	1030				2.1 J					17
MW-12	03/28/2001	MW-12_03/28/2001	N							900		7.3 J	870				3.2 J					16
MW-12	06/06/2001	MW-12_06/06/2001	N							800		3.1 J	876				4.8 J					16
MW-12	09/12/2001	MW-12_09/12/2001	N							840		10 U	920				8.3					25
MW-12	11/29/2001	MW-12_11/29/2001	N				50			1000		400 U	980	3.7 J		56	7.3 J				26	71
MW-12	03/07/2002	MW-12-001_03/07/2002	N									9.2	1280				7.1					68.8
MW-12	06/13/2002	MW-12-002_6/13/02	N							1010		10 U	944				5 U					32.6
MW-12	06/13/2002	MW-40-002_6/13/02	FD							1240		10 U	1050				5 U					33
MW-12	09/18/2002	MW-12-0032002	N							1310		27.8 U	1160				5.6 U					84.5
MW-12	12/11/2002	MW-12_12/11/02_LS	N							1610		20 U	1250				27.8 U					69.39999
MW-12	03/20/2003	MW-12_03/20/2003_LFD	FD							1190		11 U	1260				27.8 U					284 J
MW-12	03/20/2003	MW-12-005	N							1100		11 U	1280				27.8 U					540 J
MW-12	06/11/2003	MW-12-006	N				500 U			1080		10 U	1280				26.1 U					121
MW-12	09/09/2003	MW-12-007	N							1240		11 U	1310				26.1 U					26.1 U
MW-12	12/10/2003	MW-12-009	N							1720		10 U	1390				20 U					20 U
MW-12	03/16/2004	MW-12-018	N							1240		10 U	1330				20 U					94.8
MW-12	06/09/2004	MW-12-030	N		4.2 U					1570		10.4 U					5 U					10 U
MW-12	06/09/2004	MW-12-030	N	50 U	25 U	60	52	3 U	3 U	1300	3 U	5 U	1560	5 U	0.5 U	30	20 U	10 U	3 U	5 U	9	56.1 U
MW-12	06/09/2004	MW-92-030	FD		25 U					1400		5 U					5 U					10
MW-12	06/09/2004	MW-92-030	FD	50 U	4.2 U	70	56	3 U	3 U	1390	3 U	10.4 U	1560	5 U	0.5 U	40	20 U	10 U	3 U	5 U	8	59.7 U
MW-12	09/20/2004	MW-12-043	N	500 U	20.9	68.6	62.8	3 U	3 U	1440	3 U	5 U	1390	5 U	0.2 U	41.2	5 U	10 U	3 U	15 U	24.6	19.2
MW-12	09/20/2004	MW-12-043	N							1490												
MW-12	03/10/2005	MW-12-056	N	52 U	5 U	53.4	38.9	3.1 U	3.1 U	945	3.1 U	5 U	925	2.1 U	0.2 U	36.1	5 U	10 U	3.1 U	15 U	218	37.5
MW-12	03/10/2005	MW-12-056	N							883												
MW-12	03/10/2005	MW-91-056	FD	52 U	5 U	64.2	39.9	3.1 U	3.1 U	912	3.1 U	5 U	925	2.1 U	0.2 U	40.7	5 U	10 U	3.1 U	15 U	202	54.6
MW-12	03/10/2005	MW-91-056	FD							841												
MW-12	04/06/2005	MW-12-060	N							871			810									
MW-12	04/06/2005	MW-92-060	FD							868			810									
MW-12	06/13/2005	MW-12-070	N	67.9	2 U	110	44.1	1 U	1 U	835	1 U	1 U	852	1 U	0.2 U	77.3	11.7	5.73	1 U	1.11	34.2	24.4
MW-12	06/13/2005	MW-12-070	N							957												
MW-12	09/16/2005	MW-12-003	N	52 U	5 U	103	110	3 U	3 U	618	3 U	5 U	698	5.7	0.2 U	63.5	17.9	10 U	3 U	15 U	52.2	75.5
MW-12	10/04/2005	MW-12-081	N		2 U	146	300 U	1 U	1 U	644	1 U	10.4 U	660	1 U	0.2 U	76.9	20 U	3.92	1 U	1 U	41.6	20 U
MW-12	10/04/2005	MW-90-081	FD		2 U	151	300 U	1 U	1 U	613	1 U	10.4 U	670	1 U	0.2 U	79.1	20 U	4.06	1 U	1 U	39.7	20 U
MW-12	12/13/2005	MW-12-087	N	52 U	3 U	157	300 U	1 U	2 U	602	5 U	10 U	626	2 U	0.2 U	62.8	20 U	5 U	5 U	1 U	45.9	20 U
MW-12	04/18/2006	MW-12-093	N		2 U	127	48.2	1 U	1 U	1300	1 U	1 U	1210	1 U	0.2 U	52.8	3.91	4.3	1 UJ	1 U	40.8	10 U
MW-12	05/01/2006	MW-12-098	N		2 U	126	49.3	1 U	1 U	1280	1 U	1 U	1250	1 U	0.2 U	50.1	2.31	4.42	1 U	1 U	39.7	10 U

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-12	10/04/2006	MW-12-110	N		2 U	84.8	81.1	1 U	1 U	1790	1 U	4.24	1740	1 U	0.2 U	35.9	1.72	4.56	1 U	1 U	30.4	10 U
MW-12	12/13/2006	MW-12-115	N		2 U	88.7	72	1 U	1 U	1880	1 U	1 U	2050	1 U	0.2 U	32.2	2.4	5.54	1 U	1 U	31.2	22.4
MW-12	03/06/2007	MW-12-121	N		2 U	81.9	78.8	1 U	1 U	2440	1 U	1 U	2630	1 U	0.2 U	28.3	2.7	5.72	1 U	1 U	28.6	10 U
MW-12	05/03/2007	MW-12-125	N		2 U	78.5	83.1	1 U	1 U	2880	1 U	1 U	2620	1 U	0.2 U	30.3	4.21	5.84	1 U	1 U	26.3	10 U
MW-12	10/04/2007	MW-12-136	N		13	50	76	3 U	3 U	2700	3 U	5 U	2830	6.7	0.2 U	21	5 U	10 U	3 U	15 U	17	10 U
MW-12	10/04/2007	MW-90-136	FD		13	52	80	3 U	3 U	2800	3 U	5 U	2970	5 U	0.2 U	22	5 U	10 U	3 U	15 U	18	10 U
MW-12	12/13/2007	MW-12-138	N		3 U	75.4	300 U	1 U	2 U	2930	5 U	10 U		2 U	0.2 U	19.3	20 U	8	5 U	1 U	34.1	20 U
MW-12	03/10/2008	MW-12-141	N		3 U	66.1	300 U	1 U	2 U	2860	5 U	10 U		2 U	0.2 U	19.6	20 U	6.59	5 U	1 U	26.3	22.1
MW-12	05/05/2008	MW-12-143	N		3 U	62	500 U	1 U	2 U	2800	5 U	10 U	2580	5 U	0.2 U	19	20 U	6.02	5 U	10 U	17	34.4
MW-13	07/01/1997	MW-13_07/01/1997	FD				70			20 U		10 U	10 U	2 U		20	25 U				6	12
MW-13	07/01/1997	MW-13_07/01/1997	N				71			20 U		11	10 U	1.7 J		17	25 U				10 U	7.7
MW-13	07/01/1997	MW-13D(A)_07/01/1997	FD							20 U		10 U	10 U				25 U					8
MW-13	09/01/1997	MW-13_09/01/1997	N							10 J		4 J	10				24 J					23
MW-13	02/17/1998	MW-13_02/17/1998	N							16 J		10 U	22				16 J					9
MW-13	06/15/1998	MW-13_06/15/1998	N							18 J		10 U	20				9.8 J					5 UJ
MW-13	06/15/1998	MW-13D_06/15/1998	FD							16 J		3.1 J	10				9.5 J					5 UJ
MW-13	06/15/1999	MW-13_06/15/1999	N							18 J		10 U	20				9.3 J					17
MW-13	09/14/1999	MW-13_09/14/1999	N							23		10 U	10				8.1 J					6.8
MW-13	12/01/1999	MW-13_12/01/1999	N							21		1.6 J	10 U				8.1					9.6 J
MW-13	03/25/2000	MW-13_03/25/2000	N							19 J		5.4 J	24				10					29
MW-13	06/14/2000	MW-13_06/14/2000	N							20 J		9.3 J	20				7.4					31
MW-13	09/01/2000	MW-13_09/01/2000	N				62			17 J		7.9 J	20	5 U		8.5	4.8 J				4.8 J	130
MW-13	12/01/2000	MW-13_12/01/2000	N							18 J		11	26				4.5 J					72
MW-13	03/28/2001	MW-13_03/28/2001	N							17 J		10 U	10				3.5 J					9.3 J
MW-13	06/06/2001	MW-13_06/06/2001	N							25		3 J	10				7.5					20
MW-13	09/12/2001	MW-13_09/12/2001	N							22		4.3 J	14				3.7 J					32
MW-13	11/29/2001	MW-13_11/29/2001	N				55			23		400 U	28	5 U		6.9	4.6 J				6.3 J	65
MW-13	03/06/2002	MW-13-001_03/06/2002	N									5.3	26				10.6					31.3
MW-13	06/12/2002	MW-13-002_6/12/02	N							18.3		10 U	17				5.6					35.5
MW-13	09/17/2002	MW-13-003	N							34.5		20 U	18.3				11.6					171
MW-13	12/10/2002	MW-13_12/10/02_LS	N							29		20 U	22.9				27.8 U					172
MW-13	03/21/2003	MW-13-005	N							23		11 U	23.1				27.8 U					345
MW-13	06/12/2003	MW-13-006	N				500 U			180		10 U	15.9				168					451
MW-13	09/12/2003	MW-13-007	N							27.2		11 U	19.6				26.1 U					260 J
MW-13	09/12/2003	MW-90-007	FD							18.4		11 U	19.6				26.1 U					108 J
MW-13	12/12/2003	MW-13-009	N							17.7		10 U	24				20 U					30.6

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-13	12/12/2003	MW-91-009	FD							17.4		10 U	26.4				20 U					26
MW-13	03/17/2004	MW-13-018	N							17.7		10 U	19.7				20 U					82.8 J
MW-13	03/17/2004	MW-91-018	FD							16.3		10 U	19.7				20 U					133 J
MW-13	06/09/2004	MW-13-030	N				57			17.6		10.4 U	18.8				20 U					75.8 U
MW-13	07/29/2004	MW-13-037	N							17.6			18.1									
MW-13	07/29/2004	MW-91-037	FD							17.1			18.1									
MW-13	09/24/2004	MW-13-043	N							20.9			19.7									
MW-13	09/24/2004	MW-95-043	FD							19.7			19.7									
MW-13	12/16/2004	MW-13-049	N							16			19.3									
MW-13	03/11/2005	MW-13-056	N							19			19.2									
MW-13	06/14/2005	MW-13-070	N							19.1			14.8									
MW-13	10/04/2005	MW-13-081	N							24.5			20.3									
MW-13	12/13/2005	MW-13-087	N							20			21.4									
MW-13	12/13/2005	MW-90-087	FD	52 U	3 U	5 U	300 U	1 U	2 U	22.1	5 U	10 U	21.5	2 U	0.2 U	7.2	20 U	5 U	5 U	1 U	5.6	20 U
MW-13	03/08/2006	MW-13-093	N							18.9			21.8									
MW-13	03/08/2006	MW-91-093	FD							19.1			21.8									
MW-13	05/02/2006	MW-13-098	N							19.2			21.4									
MW-13	05/02/2006	MW-13-CIS	N	50 U	2 U	2.2	54.3	1 U	1 U	22.5	1 U	1 U		1 U	0.2 U	9.150001	4.48	3.96	1 U	1 U	6.44	10 U
MW-13	05/02/2006	MW-90-098	FD							20.5			21.2									
MW-13	10/02/2006	MW-13-110	N							21.4			24.6									
MW-13	03/05/2007	MW-13-121	N							25.2			23.4									
MW-13	10/02/2007	MW-13-136	N							23.6			21.8									
MW-14	07/01/1997	MW-14_07/01/1997	N				130			35		12	35	2.6 J		25	25 U				16	34
MW-14	09/01/1997	MW-14_09/01/1997	N							22		4 J	20				11 J					14
MW-14	02/17/1998	MW-14_02/17/1998	N							24		10 U	28				25 U					8
MW-14	06/15/1998	MW-14_06/15/1998	N							27		4.1 J	26 J				1.3 J					13 J
MW-14	06/15/1999	MW-14_06/15/1999	N							19 J		10 U	10 U				25 U					17
MW-14	09/14/1999	MW-14_09/14/1999	N							36		10 U	20				25 U					9.5
MW-14	12/03/1999	MW-14_12/03/1999	N							39		4.3 J	10				5					19
MW-14	03/25/2000	MW-14_03/25/2000	N							31		8.6 J	32				1.4 J					76
MW-14	06/14/2000	MW-14_06/14/2000	N							27		5.2 J	20				5 J					35
MW-14	09/01/2000	MW-14_09/01/2000	N				110			31		4.2 J	53	5 U		8	2.7 J				4.1 J	14
MW-14	12/01/2000	MW-14_12/01/2000	N							34		6.8 J	30				3.4 J					61
MW-14	03/28/2001	MW-14_03/28/2001	N							31		10 U	30				1.7 J					14
MW-14	09/12/2001	MW-14_09/12/2001	N							28		4.7 J	10				2.7 J					110
MW-14	11/30/2001	MW-14_11/30/2001	N				98			100		3.8 J	35	2.2 J		6.7	16				7.9 J	46

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-14	03/07/2002	MW-14-001_03/07/2002	N									29.7	99				12.5					61.7
MW-14	06/12/2002	MW-14-002_6/12/02	N							29.2		10 U	27.9				16.5					143
MW-14	09/18/2002	MW-14-003	N							32.6		20 U	31				22.1					164
MW-14	12/10/2002	MW-14_12/10/02_LS	N							48.4		20 U	49				28.5					498
MW-14	03/21/2003	MW-14_03/21/2003_LFD	FD							36.7		11 U	48.4				27.8 U					105 J
MW-14	03/21/2003	MW-14-005	N							36.5		11 U	47.3				27.8 U					300 J
MW-14	06/12/2003	MW-14-006	N				500 U			30.9		10.4 U	30.6				39.7 J					244
MW-14	09/11/2003	MW-14-007	N							32.4		11 U	47.3				26.1 U					45
MW-14	12/12/2003	MW-14-009	N							29.3		10 U	44.5				20 U					36.1
MW-14	03/16/2004	MW-14-018	N							26.8		10 U	43.6				20 U					58
MW-14	06/08/2004	MW-14-030	N				110			36.3		10.4 U	32.6				20 U					67.6 U
MW-14	06/08/2004	MW-90-030	FD				100			34.3		10.4 U	32.2				20 U					68.5 U
MW-14	09/08/2004	MW-14-042	N	52 U										20.8 U		20.8 U						
MW-14	09/20/2004	MW-14-043	N							30.3			33.6									
MW-14	09/20/2004	MW-96-043	FD							31.4			33.4									
MW-14	12/16/2004	MW-14-049	N							24.2			31.3									
MW-14	03/09/2005	MW-14-056	N							32.5			32									
MW-14	04/07/2005	MW-14-060	N							38			34.3									
MW-14	05/11/2005	MW-14-WQ6	N		2 U	1.24	96.8	1 U	1 U	36.9	1.01	3.48	32	1.38	0.5 U	10.8	12.5	3.65	1 U	1 U	6.52	19.6 J
MW-14	05/11/2005	MW-14-WQ6	N							43.5												
MW-14	06/15/2005	MW-14-070	N							30.4			30									
MW-14	06/15/2005	MW-91-070	FD							29.2			28.4									
MW-14	10/06/2005	MW-14-081	N							34.8			35.4									
MW-14	12/15/2005	MW-14-087	N							30			31.7									
MW-14	03/09/2006	MW-14-093	N							29.1			32.5									
MW-14	05/02/2006	MW-14-098	N							27.6			32.6									
MW-14	05/02/2006	MW-14-CIS	N	50 U	2 U	1.4	104	1 U	1 U	33.1	1 U	1 U		1 U	0.2 U	11.6	4.61	4.26	1 U	1 U	5.02	10 U
MW-14	10/02/2006	MW-14-110	N							27			31.2									
MW-14	10/02/2006	MW-91-110	FD							28.9			32.6									
MW-14	03/12/2007	MW-14-121	N							13.4			13									
MW-14	10/02/2007	MW-14-136	N							31.2			27.2									
MW-15	07/01/1997	MW-15_07/01/1997	N				120			23		16	10 U	3.9 J		30	12 J				27	48
MW-15	07/01/1997	MW-15D_07/01/1997	FD							23		19	10 U				10 J					40
MW-15	09/01/1997	MW-15_09/01/1997	N							20 U		10 U	10 U				10 J					6
MW-15	02/17/1998	MW-15_02/17/1998	N							20 U		10 U	10 U				25 U					4 J
MW-15	06/15/1998	MW-15_06/15/1998	N							20 U		10 U	10 U				25 U					5 UJ

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-15	06/15/1999	MW-15_06/15/1999	N							13 J		10 U	10				25 U					29
MW-15	09/14/1999	MW-15_09/14/1999	N							20 U		10 U	10 U				25 U					16
MW-15	12/03/1999	MW-15_12/03/1999	N							12 J		6 J	10 UJ				2 J					46
MW-15	03/25/2000	MW-15_03/25/2000	N							17 J		7.2 J	22				2.7 J					24
MW-15	06/14/2000	MW-15_06/14/2000	N							13 J		8.9 J	10				3.1 J					17
MW-15	09/01/2000	MW-15_09/01/2000	N				57			10 J		10 U	10 U	5 U		17	2 J				12	6.1 J
MW-15	12/01/2000	MW-15_12/01/2000	N							12 J		14	10 U				3.1 J					52
MW-15	03/28/2001	MW-15_03/28/2001	N							16 J		10 U	10				1.4 J					11
MW-15	06/06/2001	MW-15_06/06/2001	N							11 J		10 U	10				5					6.5 J
MW-15	09/12/2001	MW-15_09/12/2001	N							12 J		10 U	10 U				2.7 J					20
MW-15	11/29/2001	MW-15_11/29/2001	N				70			12 J		400 U	26	5 U		9.6	1.6 J				9.7 J	72
MW-15	03/06/2002	MW-15-001_03/06/2002	N									7	50				9.9					38
MW-15	12/10/2002	MW-15_12/10/02_LS	N							19.4		20 U	22.9				27.8 U					419
MW-15	03/18/2003	MW-15-005	N							20.9		11 U	29.4				27.8 U					276
MW-15	06/12/2003	MW-15-006	N				500 U			13		10 U	11.1				26.1 U					220
MW-15	09/11/2003	MW-15-007	N							11.6		11 U	20.8				26.1 U					52.6
MW-15	12/12/2003	MW-15-009	N							8.2		10 U	13.1				20 U					37
MW-15	03/16/2004	MW-15-018	N							7.9		10 U	16.4				28					52.9
MW-15	06/07/2004	MW-15-030	N				52			9.4		10.4 U	8				20 U					35.6 U
MW-15	09/22/2004	MW-15-043	N							7.5			7.9									
MW-15	12/17/2004	MW-15-049	N							6.5			7.7									
MW-15	03/09/2005	MW-15-056	N							8.4			8.4									
MW-15	06/17/2005	MW-15-070	N							8			7.7									
MW-15	10/06/2005	MW-15-081	N							14 J			7.6									
MW-15	03/07/2006	MW-15-093	N							13.8			15.2									
MW-15	10/05/2006	MW-15-110	N							11.4			12.1									
MW-15	05/04/2007	CIS-026	N		1.58		80.7			21		1.11	21.1	1.27		9.69	3.08	4.58			10.9	10 U
MW-15	10/02/2007	MW-15-136	N							12.5			12.2									
MW-19	06/15/1998	MW-19_06/15/1998	N							740		10 U	726				25 U					37 J
MW-19	06/15/1999	MW-19_06/15/1999	N							730		10 U	638				25 U					15
MW-19	06/15/1999	MW-19D_06/15/1999	FD							730		10 U	649				25 U					19
MW-19	09/14/1999	MW-19_09/14/1999	N							690		10 U	622				25 U					23
MW-19	12/01/1999	MW-19_12/01/1999	N							710		4.5 J	681				2.8 J					17
MW-19	03/23/2000	MW-19_03/23/2000	N							600		10 U	557				1.3 J					44
MW-19	06/14/2000	MW-19_06/14/2000	N							600		1.6 J	647				1.2 J					43
MW-19	09/01/2000	MW-19_09/01/2000	N				86			670		6.1 J	647	5 U		4 J	2.6 J				3.8 J	26

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-19	12/01/2000	MW-19_12/01/2000	N							670		7.6 J	689				5 U					31
MW-19	03/28/2001	MW-19_03/28/2001	N							660		3.3 J	700				25 U					11
MW-19	06/06/2001	MW-19_06/06/2001	N							610		10 U	657				25 U					16
MW-19	09/12/2001	MW-19_09/12/2001	N							650		10 U	720				1.4 J					17
MW-19	11/29/2001	MW-19_11/29/2001	N				76			640		400 U	680	5 U		4.3 J	3.8 J				2.9 J	70
MW-19	03/07/2002	MW-19-001_03/07/2002	N									12.6	966				7					48
MW-19	06/12/2002	MW-19-002_6/12/02	N							734		10 U	837				5 U					30.6 J
MW-19	06/12/2002	MW-41-002_6/12/02	FD							829		10 U	826				6.2					106 J
MW-19	12/10/2002	MW-19_12/10/02_LS	N							750		20 U	761				10.1 J					356
MW-19	03/21/2003	MW-19-005	N							631		11 U	748				27.8 U					176
MW-19	06/11/2003	MW-19-006	N				500 U			614		10 U	581				26.1 U					398
MW-19	09/12/2003	MW-19-007	N							602		11 U	725				26.1 U					101
MW-19	12/10/2003	MW-19-009	N							639		10 U	751				20 U					20 U
MW-19	03/16/2004	MW-19-018	N							589		10 U	796				20 U					112 J
MW-19	06/08/2004	MW-19-030	N				80			718		10.4 U	813				20 U					31.5 U
MW-19	09/20/2004	MW-19-043	N							994			732									
MW-19	12/17/2004	MW-19-049	N							786			796									
MW-19	03/07/2005	MW-19-056	N							1010			1080									
MW-19	06/14/2005	MW-19-070	N							1140			1150									
MW-19	10/04/2005	MW-19-081	N							996			1060									
MW-19	12/12/2005	MW-19-087	N							1270			1240									
MW-19	03/09/2006	MW-19-093	N							1080			1090									
MW-19	05/02/2006	MW-19-098	N							1120			1130									
MW-19	05/02/2006	MW-19-CIS	N	50 U	2 U	1.32	81.2	1 U	1 U	1130	1 U	1 U		1 U	0.2 U	7.72	20.2	4.21	1 U	1 U	5.02	10 U
MW-19	10/02/2006	MW-19-110	N							1300			970									
MW-19	12/15/2006	MW-19-115	N							1090			1070 J									
MW-19	03/06/2007	MW-19-121	N							1030			1040									
MW-19	05/02/2007	MW-19-125	N							777			836									
MW-19	10/05/2007	MW-19-136	N							1510			1390									
MW-20-70	06/15/1998	MW-20/70_06/15/1998	N							12200		3.3 J	12600				25 U					12 J
MW-20-70	06/15/1998	MW-20/70D_06/15/1998	FD							11300		10 U	10700				25 U					9.1 J
MW-20-70	06/15/1999	MW-20/70_06/15/1999	N				56			12300		3.5 J	6780	3 J		8.9	25 U				29	16
MW-20-70	07/15/1999	MW-20/70_07/15/1999	N							13200		10 U	12900				25 U					19
MW-20-70	09/14/1999	MW-20/70_09/14/1999	N							9200		10 U	8240				25 U					29.7
MW-20-70	09/14/1999	MW-20/70D_09/14/1999	FD							10300		10 U	9030				25 U					48.6
MW-20-70	12/01/1999	MW-20/70_12/01/1999	N							11000		8.1 J	10400				1.9 J					31

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-20-70	12/01/1999	MW-20/70D_12/01/1999	FD							10900		4.6 J	10700				1.3 J					29
MW-20-70	03/25/2000	MW-20/70 D_03/25/2000	FD							12000		3.3 J	13100				2.3 J					25
MW-20-70	03/25/2000	MW-20/70_03/25/2000	N							12000		3.8 J	12800				6.1					26
MW-20-70	06/15/2000	MW-20/70 D_06/15/2000	FD							11300		4.1 J	11400				29					11
MW-20-70	06/15/2000	MW-20/70_06/15/2000	N							11500		10 U	11500				9.9					16
MW-20-70	09/01/2000	MW-20/70_09/01/2000	N				53			8600		4.8 J	8990	5 U		16	2.2 J				12	13
MW-20-70	09/01/2000	MW-20/70D_09/01/2000	FD							8400		3 J	8300				3.1 J					28
MW-20-70	12/01/2000	MW-20/70_12/01/2000	N							10200		4.3 J	10900				5					23
MW-20-70	12/01/2000	MW-20/70D_12/01/2000	FD							10400		3.9 J	10700				5					21
MW-20-70	03/28/2001	MW20-70(D)_03/28/2001	FD							11400		3.3 J	11600				1.6 J					24
MW-20-70	03/28/2001	MW20-70_03/28/2001	N							11600		3.4 J	12000				2.1 J					25
MW-20-70	06/06/2001	MW20-70_06/06/2001	N							10400		3.2 J	11100				6.1					23
MW-20-70	06/06/2001	MW20-70D_06/06/2001	FD							10500		4 J	9890				12					91
MW-20-70	09/12/2001	MW-20/70_09/12/2001	N							7300		3.2 J	8100				2.5 J					22
MW-20-70	09/12/2001	MW-20/70D_09/12/2001	FD							7700		3 J	8100				1.9 J					21
MW-20-70	11/30/2001	MW-20/70_11/30/2001	N				56			9900		400 U	9000	1.6 J		16	400 U				6.4 J	66
MW-20-70	11/30/2001	MW-20/70D_11/30/2001	FD							9600		400 U	8300				2 J					57
MW-20-70	03/07/2002	MW-20-70-001_03/07/20(	N									78.5	13200				18.2					134
MW-20-70	06/13/2002	MW-20-70-002_6/13/02	N							11700		10 U	12200				6.9					25.1 J
MW-20-70	09/17/2002	MW-20-70-003	N							9790		20 U	8240				13.7					478
MW-20-70	12/11/2002	MW-20-70_12/11/02_LS	N							13800		20 U	8760				27.8 U					123
MW-20-70	03/20/2003	MW-20-70-005	N							10200		11 U	11600				27.8 U					217
MW-20-70	06/11/2003	MW-20-70-006	N				500 U			9230		19.9	11900				26.1 U					149
MW-20-70	09/09/2003	MW-20-70-007	N							10800		11 U	9690				26.1 U					23.8 J
MW-20-70	12/10/2003	MW-20-70-009	N							15900		10 U	9870				20 U					78.7
MW-20-70	03/03/2004	MW-20-70-016	N							10800			11200									
MW-20-70	03/15/2004	MW-20-70-018	N							9770		10 U	11200				20 U					530
MW-20-70	05/11/2004	MW-20-070-026	N							12000			11000									
MW-20-70	06/11/2004	MW-20-70-030	N							11300		10.4 U	12400				20 U					61.1 U
MW-20-70	09/24/2004	MW-20-070-043	N	500 U	5 U	10 U	59.1	3 U	3 U	7800	3 U	10.8	7680	5 U	0.2 U	20.6	5 U	18.1	3 U	15 U	3 U	24.8
MW-20-70	09/24/2004	MW-20-070-043	N							7550												
MW-20-70	12/16/2004	MW-20-070-049	N	52 U	5 U	10 U	36.6	3.1 U	3.1 U	7230	3.1 U	5 U	7800	2.1 U	0.2 U	18.1	5 U	10 U	3.1 U	15 U	9.4	25.6
MW-20-70	12/16/2004	MW-20-070-049	N							7840												
MW-20-70	03/10/2005	MW-20-70-056	N	52 U	5 U	10 U	51	3.1 U	3.1 U	8630	3.1 U	5 U	8280	2.1 U	0.2 U	13	5.2	10 U	3.1 U	15 U	91.6	136
MW-20-70	03/10/2005	MW-20-70-056	N							8120												
MW-20-70	04/07/2005	MW-20-070-060	N							9020			8740									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-20-70	06/15/2005	MW-20-070-070	N	50 U	2 U	1.59	47.4	1 U	1 U	6430	1 U	1 U	6680	1 U	0.2 U	17.5	2.41	7.36	1 U	1 U	7.46	43.1 J
MW-20-70	06/15/2005	MW-20-070-070	N							6450												
MW-20-70	06/15/2005	MW-92-070	FD	50 U	2 U	1.62	51.8	1 U	1 U	7130	1 U	1.86	7000	1.37	0.2 U	17.9	2.28	7.829999	1 U	1 U	8.240001	159 J
MW-20-70	06/15/2005	MW-92-070	FD							7080												
MW-20-70	10/11/2005	MW-20-070-081	N		2 U	2.04	300 U	1 U	1 U	5930	1 U	10.4 U	6060	1 U	0.2 U	23	20 U	8.809999	1 U	1 U	117	20 U
MW-20-70	12/15/2005	MW-20-070-087	N	52 U	3 U	5 U	300 U	1 U	2 U	4310	5 U	10 U	4640	2 U	0.2 U	21.8	20 U	5 U	5 U	1 U	10.2	20 U
MW-20-70	03/10/2006	MW-20-070-093	N		2 U	2.2	36.5	1 U	1 U	4510	1 U	1.07	5170	1 U	0.2 U	21.8	1 U	9.150001	1 U	1 U	10.7	11.2
MW-20-70	05/05/2006	MW-20-070-098	N							4440			4100									
MW-20-70	05/05/2006	MW-20-070-CIS	N	50 U	2 U	2.01	39.9	1 U	1 U	4670	1 U	1 U		1 U	0.2 U	22.4	1 U	10.1	1 U	1 U	9.66	10 UJ
MW-20-70	10/03/2006	MW-20-070-110	N		2 U	1.92	37.8	1 U	1 U	3390	1 U	1 U	3290	1 U	0.2 U	28.9	1 U	11.1	1 U	1 U	9.61	10 U
MW-20-70	10/03/2006	MW-90-110	FD		2 U	1.79	37.3	1 U	1 U	3330	1 U	1 U	3410	1 U	0.2 U	27.1	1 U	10.9	1 U	1 U	9.259999	10 U
MW-20-70	12/13/2006	MW-20-070-115	N		2 U	1.78	35.4	1 U	1 U	3120	1 U	1 U	3430	1 U	0.2 U	23.6	1 U	12.2	1 U	1 U	8.89	10 U
MW-20-70	03/14/2007	MW-20-070-121	N		2 U	1.79	34.3	1 U	1 U	2720	1 U	1 U	2820	1 U	0.2 U	25.9	1.2	11.5	1 U	1 U	8.96	10 U
MW-20-70	05/03/2007	MW-20-070-125	N		2 U	1.66	33.7	1 U	1 U	3050	1 U	1.61	2790	1 U	0.2 U	26.3	1 U	11.1	1 U	1 U	7.77	14.5
MW-20-70	10/11/2007	MW-20-070-136	N		8.8	10 U	33	3 U	3 U	2140	3 U	5 U	2400	5 U	0.2 U	26	5 U	10 U	3 U	15 U	3.4	10 U
MW-20-100	06/15/1999	MW-20/100_06/15/1999	N				42 J			1700		50	1550	17 J		29	130				50	27
MW-20-100	07/15/1999	MW-20/100_07/15/1999	N							1500		7.1 J	1350				25 U					230
MW-20-100	09/14/1999	MW-20/100_09/14/1999	N							2700		10 U	2490				25 U					41.2
MW-20-100	09/14/1999	MW-20/100D_09/14/199	FD							2700		10 U	2410				25 U					50.6
MW-20-100	12/01/1999	MW-20/100_12/01/1999	N							2800		4.1 J	2940				5					6.1 J
MW-20-100	12/01/1999	MW-20/100D_12/01/199	FD							2800		10 U	2780				5					6.5 J
MW-20-100	03/23/2000	MW-20/100_03/23/2000	N							2400		10 U	2290				5					27
MW-20-100	03/23/2000	MW-20/100D_03/23/200	FD							2400		7.1 J	2300				5					54
MW-20-100	06/14/2000	MW-20/100_06/14/2000	N							2200		2 J	2440				0.94 J					16
MW-20-100	06/14/2000	MW-20/100D_06/14/200	FD							2200		10 U	2410				1.5 J					12
MW-20-100	09/01/2000	MW-20/100_09/01/2000	N				31			2700		3.4 J	2760	5 U		21	3.7 J				9.4 J	27
MW-20-100	09/01/2000	MW-20/100D_09/01/200	FD							2800		10 U	3040				2.4 J					18
MW-20-100	12/01/2000	MW-20/100_12/01/2000	N							2900		2.5 J	3060				7.4					27
MW-20-100	12/01/2000	MW-20/100D_12/01/200	FD							3000		10 U	3090				1.3 J					25
MW-20-100	03/28/2001	MW20-100(D)_03/28/200	FD							2500		7.3 J	2690				25 U					31
MW-20-100	03/28/2001	MW20-100_03/28/2001	N							2500		6.9 J	2690				2 J					30
MW-20-100	06/06/2001	MW20-100_06/06/2001	N							2600		5.8 J	2840				12					35
MW-20-100	06/06/2001	MW20-100D_06/06/2001	FD							2500		10 U	2790				1.8 J					15
MW-20-100	09/12/2001	MW-20/100_09/12/2001	N							2800		10 U	3300				1.1 J					26
MW-20-100	09/12/2001	MW-20/100D_09/12/2001	FD							2700		10 U	3100				1 J					21
MW-20-100	11/30/2001	MW-20/100_11/30/2001	N				32 J			2900		400 U	3000	0.94 J		6.1	3.7 J				5 J	67

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-20-100	11/30/2001	MW-20/100D_11/30/2001	FD							3000		400 U	3000				400 U					52
MW-20-100	03/07/2002	MW-20-100-001_03/07/2(	N									12.3	3440				12.8 J					141 J
MW-20-100	03/07/2002	MW-50-001_03/07/2002	FD									17.3	3280				19.4 J					61.8 J
MW-20-100	06/13/2002	MW-20-100-002_6/13/02	N							2940		10 U	2920				5.4					41.9
MW-20-100	09/17/2002	MW-20-100-003	N							3320		20 U	2820				11.1					206 J
MW-20-100	09/17/2002	MW-42-003	FD							3220		27.8 U	2580				12.8					486 J
MW-20-100	12/11/2002	MW-20-100_12/11/02_LS	N							3870		20 U	3080				27.8 U					84.7
MW-20-100	03/20/2003	MW-20-100-005	N							2640		11 U	2910				27.8 U					153
MW-20-100	06/11/2003	MW-20-100-006	N				500 U			2180		10 U	2770				26.1 U					144
MW-20-100	09/09/2003	MW-20-100-007	N							2630		11 U	2740				26.1 U					60.9
MW-20-100	12/10/2003	MW-20-100-009	N							3170		10 U	2790				20 U					233
MW-20-100	03/03/2004	MW-20-100-016	N							2400			2890									
MW-20-100	03/15/2004	MW-20-100-018	N							2940		10 U	3490				20 U					150 J
MW-20-100	05/11/2004	MW-20-100-026	N							3960			4740									
MW-20-100	06/11/2004	MW-20-100-030	N							3500		10.4 U	3910				20 U					55.8 U
MW-20-100	09/24/2004	MW-20-100-043	N							5480			5890									
MW-20-100	12/16/2004	MW-20-100-049	N							7910			8130									
MW-20-100	03/10/2005	MW-20-100-056	N							7770			8440									
MW-20-100	06/15/2005	MW-20-100-070	N							10100			9600									
MW-20-100	10/11/2005	MW-20-100-081	N							9430			10200									
MW-20-100	12/15/2005	MW-20-100-087	N							9010			9460									
MW-20-100	03/10/2006	MW-20-100-093	N							10200			10100									
MW-20-100	05/05/2006	MW-20-100-098	N							12100			10400									
MW-20-100	10/03/2006	MW-20-100-110	N							10300			9520									
MW-20-100	12/13/2006	MW-20-100-115	N							9220 J			9610									
MW-20-100	12/13/2006	MW-90-115	FD							11500 J			9400									
MW-20-100	03/14/2007	MW-20-100-121	N							9270			9470									
MW-20-100	05/03/2007	MW-20-100-125	N							9820			10100									
MW-20-100	05/03/2007	MW-90-125	FD							10500			10000									
MW-20-100	10/10/2007	MW-20-100-136	N	43	10 U	25	3 U	3 U		10700	3 U	5 U	9000	5 U	0.2 U	5 U	5 U	10 U	3 U	15 U	3 U	10 U
MW-20-130	06/15/1999	MW-20/130_06/15/1999	N			49 J				5200		100	3510	42 J		50	250				100	53
MW-20-130	06/15/1999	MW-20/130D_06/15/1999	FD							5300		100	4080				250					53
MW-20-130	07/15/1999	MW-20/130_07/15/1999	N							4100		10 U	3660				25 U					78
MW-20-130	09/14/1999	MW-20/130_09/14/1999	N							5600		10 U	5080				25 U					20.9
MW-20-130	09/14/1999	MW-20/130D_09/14/1999	FD							5700		10 U	5540				25 U					27.7
MW-20-130	12/01/1999	MW-20/130_12/01/1999	N							5600		11	5510				2 J					54

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-20-130	12/01/1999	MW-20/130D_12/01/1999	FD							5500		6.6 J	4810				5					43
MW-20-130	03/23/2000	MW-20/130_03/23/2000	N							4500		2.4 J	4380				5					160
MW-20-130	03/23/2000	MW-20/130D_03/23/2000	FD							2800		3 J	2740				5					160
MW-20-130	06/14/2000	MW-20/130_06/14/2000	N							4800		10 U	5690				25 U					15
MW-20-130	06/14/2000	MW-20/130D_06/14/2000	FD							4500		10 U	5280				3.3 J					19
MW-20-130	09/01/2000	MW-20/130_09/01/2000	N				42			6700		2.4 J	6340	5 U		50	5.1				10 U	10
MW-20-130	09/01/2000	MW-20/130D_09/01/2000	FD							5700		10 U	6570				2 J					19
MW-20-130	12/01/2000	MW-20/130_12/01/2000	N							5400		10 U	6140				5					24
MW-20-130	12/01/2000	MW-20/130D_12/01/2000	FD							5500		10 U	6140				2.9 J					27
MW-20-130	03/28/2001	MW20/130_03/28/2001	N							4500		5.8 J	5210				25 U					190
MW-20-130	03/28/2001	MW-20/130D_03/28/2001	FD							4300		6.2 J	5180				0.79 J					200
MW-20-130	06/06/2001	MW20-130_06/06/2001	N							4700		3.3 J	5370				2.2 J					22
MW-20-130	06/06/2001	MW20-130D_06/06/2001	FD							5000		7.3 J	5610				18					180
MW-20-130	09/12/2001	MW-20/130_09/12/2001	N							5100		10 U	5800				1 J					21
MW-20-130	09/12/2001	MW-20/130D_09/12/2001	FD							5000		10 U	6000				2.5 J					25
MW-20-130	11/30/2001	MW-20/130_11/30/2001	N				33 J			5500		400 U	5500	5 U		18	400 U				10 U	45 J
MW-20-130	11/30/2001	MW-20/130D_11/30/2001	FD							5300		400 U	5600				400 U					5 U
MW-20-130	03/07/2002	MW-20-130-001_03/07/20	N									6.1	6440				13.6					39.7
MW-20-130	06/13/2002	MW-20-130-002_6/13/02	N							7370		10 U	6740				12.7					30.9 J
MW-20-130	06/13/2002	MW-42-002_6/13/02	FD							7150		10 U	6770				10.6					49.3 J
MW-20-130	09/17/2002	MW-20-130-003	N							7090		20 U	6620				32					203
MW-20-130	12/11/2002	MW-20-130_12/11/02_LS	N							9890		20 U	6100				11.2 J					132
MW-20-130	03/20/2003	MW-20-130-005	N							5160		11 U	6300				27.8 U					176
MW-20-130	06/11/2003	MW-20-130-006	N				500 U			5020		10 U	6440				26.1 U					131
MW-20-130	09/09/2003	MW-20-130-007	N							6000		11 U	6080				26.1 U					26.1 U
MW-20-130	12/10/2003	MW-20-130-009	N							7060		10 U	5940				20 U					57.1
MW-20-130	03/03/2004	MW-20-130-016	N							5260			6050									
MW-20-130	03/15/2004	MW-20-130-018	N							6670		10 U	7960				20 U					201
MW-20-130	05/11/2004	MW-20-130-026	N							7260			7710									
MW-20-130	06/11/2004	MW-20-130-030	N							7270		10.4 U	7860				20 U					100 U
MW-20-130	09/24/2004	MW-20-130-043	N	500 U	5 U	10 U	40.3	3 U	3 U	7000	3 U	15	7380	5 U	0.2 U	47.2	5 U	23	3 U	15 U	3 U	43.7
MW-20-130	09/24/2004	MW-20-130-043	N							7490												
MW-20-130	01/27/2005	MW-20-130-049	N	52 U	5 U	10 U	26.8	3 U	3 U	8410	3 U	5 U	8600	2.1 U	0.2 U	44.4	5 U	13	3 U	15 U	11.6	24.6
MW-20-130	01/27/2005	MW-20-130-049	N							9400												
MW-20-130	03/09/2005	MW-20-130-056	N	52 U	5 U	10 U	21.5	3.1 U	3.1 U	8170	3.1 U	5 U	8730	2.1 U	0.2 U	33.6	5 U	10 U	3.1 U	15 U	172	84.5 J
MW-20-130	03/09/2005	MW-20-130-056	N							8900												

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-20-130	03/09/2005	MW-93-056	FD	52 U	5 U	10 U	20	3.1 U	3.1 U	8170	3.1 U	5 U	8810	2.1 U	0.2 U	29	5.3	10 U	3.1 U	15 U	162	173 J
MW-20-130	03/09/2005	MW-93-056	FD							7050												
MW-20-130	04/07/2005	MW-20-130-060	N							8870			8980									
MW-20-130	06/15/2005	MW-20-130-070	N	50 U	2 U	7.42	26.5	1 U	1 U	10300	1 U	1.62	10800	1 U	0.2 U	57.6	1 U	10.7	1 U	1 U	4.13	31.9
MW-20-130	06/15/2005	MW-20-130-070	N							11300												
MW-20-130	10/07/2005	MW-20-130-081	N		2 U	6.58	300 U	1 U	1 U	10700	1 U	5 U	9590	1 U	0.2 U	41.3	21 U	10.8	1 U	1 U	3 U	20 U
MW-20-130	12/16/2005	MW-20-130-087	N	52 U	3 U	5.8	300 U	1 U	2 U	9340	5 U	10 U	10500	2 U	0.2 U	32.6	20 U	18.4	5 U	1 U	10.1	445
MW-20-130	03/10/2006	MW-20-130-093	N		2 U	6.68	24.9	1 U	1 U	10600	1 U	3.73	10700	1 U	0.2 U	46.7	1 U	12	1 U	1 U	5.32	10 U
MW-20-130	05/05/2006	MW-20-130-098	N		2 U	6.32	26.3	1 U	1 U	13700	1 U	1 U	12000	1 U	0.2 U	47.7	1 U	11.8	1 U	1 U	3.91	14.7 J
MW-20-130	10/18/2006	MW-20-130-110	N		2 U	6.2	26.8	1 U	1 U	16400	1 U	1 U	11600	1 U	0.2 U	45.5	1 U	13.6	1 U	1 U	3.87	10.2
MW-20-130	12/13/2006	MW-20-130-115	N		2 U	5.56	25.5	1 U	1 U	10500	1 U	1 U	12000	1 U	0.2 U	44.5	1 U	13.9	1 U	1 U	3.42	10 U
MW-20-130	12/13/2006	MW-95-115	FD		2 U	5.53	25.1	1 U	1 U	10700	1 U	1 U	11800	1 U	0.2 U	44	1 U	13.6	1 U	1 U	3.4	10 U
MW-20-130	03/08/2007	MW-20-130-121	N		2 U	5.52	25	1 U	1 U	11900	1.09	1 U	12800	1 U	0.2 U	43.8	1 U	16.1	1 U	1 U	2.74	10 U
MW-20-130	03/08/2007	MW-90-121	FD		2 U	5.44	25.2	1 U	1 U	12100	1 U	1 U	14400	1 U	0.2 U	44	1 U	15.7	1 U	1 U	2.8	10 U
MW-20-130	05/03/2007	MW-20-130-125	N		2 U	5.94	24.8	1 U	1 U	16200	1 U	1 U	13400	1 U	0.2 U	49.3	1 U	12.8	1 U	1 U	2.75	10 U
MW-20-130	05/03/2007	MW-95-125	FD		2 U	5.92	24.7	1 U	1 U	14800	1 U	1 U	13500	1 U	0.2 U	47.9	1 U	11.9	1 U	1 U	3.13	10 U
MW-20-130	10/05/2007	MW-20-130-136	N							13000			12200									
MW-21	06/15/1999	MW-21_06/15/1999	N							20 U		5.3 J	20				25 U					5 U
MW-21	09/14/1999	MW-21_09/14/1999	N							20 U		5.2 J	10 U				25 U					5.3
MW-21	12/03/1999	MW-21_12/03/1999	N							20 U		8.2 J	10 UJ				5					16
MW-21	03/25/2000	MW-21_03/25/2000	N							20 U		5.6 J	10 U				3.3 J					8.9 J
MW-21	06/15/2000	MW-21_06/15/2000	N							20 U		4.7 J	10 U				1.7 J					10
MW-21	09/01/2000	MW-21_09/01/2000	N				41			20 U		9.5 J	10 U	5 U		26	5.8				3.7 J	12
MW-21	12/01/2000	MW-21_12/01/2000	N							20 U		6.4 J	10 U				1.8 J					17
MW-21	03/28/2001	MW-21_03/28/2001	N							20 U		5.6 J	10 U				3.8 J					10
MW-21	06/06/2001	MW-21_06/06/2001	N							14 J		8 J	10 U				5.6					36
MW-21	09/12/2001	MW-21_09/12/2001	N							16 J		23	10 U				8.9					590
MW-21	11/30/2001	MW-21_11/30/2001	N				42 J			800 U		400 U	10 U	5 U		5 U	15 J				10 U	89 J
MW-21	03/08/2002	MW-21-001_03/08/2002	N									111	10 U				36					363
MW-21	06/13/2002	MW-21-002_6/13/02	N							4		10 U					14.2					88.9
MW-21	09/18/2002	MW-21-003	N							1.9		20 U	10 U				16.6					99
MW-21	12/11/2002	MW-21_12/11/02_LS	N							7.4		20 U	10 U				17.2 J					337
MW-21	03/21/2003	MW-21-005	N							10.6		11 U	10 U				26.4 J					364
MW-21	06/12/2003	MW-21-006	N				500 U			2.3 J		13.2	10 U				34.2					456
MW-21	09/10/2003	MW-21-007	N							1 U		38.7					26.1 J					68.4
MW-21	11/04/2003	MW-21-008	N							1 U												

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-21	12/11/2003	MW-21-009	N							3.3		23.9					20.4					287
MW-21	01/14/2004	MW-21-010	N							1 U												
MW-21	02/26/2004	MW-21-015	N							1 U			1 UJ									
MW-21	03/16/2004	MW-21-018	N							1 U		51.5	0.2 UJ				60					692
MW-21	04/14/2004	MW-21-022	N							8 U			1.5 UJ									
MW-21	05/11/2004	MW-21-026	N							1 UJ			1 U									
MW-21	06/08/2004	MW-21-030	N				37			1 U		18.3	1 UJ				158					97 U
MW-21	07/14/2004	MW-21-035	N							1 U			1 U									
MW-21	08/12/2004	MW-21-039	N							1 U			1 U									
MW-21	09/21/2004	MW-21-043	N							1 U			1 U									
MW-21	12/17/2004	MW-21-049	N							1 U			0.2 UJ									
MW-21	03/08/2005	MW-21-056	N							1 U			1 U									
MW-21	06/14/2005	MW-21-070	N							1 U			1 U									
MW-21	10/05/2005	MW-21-081	N							1 UJ			1 UJ									
MW-21	12/14/2005	MW-21-087	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	37.1	1 U	2 U	0.2 U	23.9	27.9	29.8	5 U	1 U	12.1	74.60001
MW-21	05/02/2006	MW-21-098	N							1 U			1 U									
MW-21	10/03/2006	MW-21-110	N							1 U			1 U									
MW-21	12/13/2006	MW-21-115	N							1 U			1 U									
MW-21	03/09/2007	MW-21-121	N							1 U			1 U									
MW-21	05/01/2007	MW-21-125	N							1.4			1 U									
MW-21	10/04/2007	MW-21-136	N							1 U			5 U									
MW-21	12/11/2007	MW-21-138	N		3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U		2 U	0.2 U	38.2	20 U	16.2	5 U	1 U	5 U	20 U
MW-21	03/11/2008	MW-21-141	N		3 U	5 U	300 U	1 U	2 U	1.8	5 U	10 U		2 U	0.2 U	39.6	20 U	38	5 U	1 U	5 U	20 U
MW-21	05/06/2008	MW-21-143	N		5 U	5.39 U	500 U	1 U	2 U	3.01	5 U	10 U	1.05 U	5 U	0.2 U	52	20 U	12	5 U	1 U	6.2	20 U
MW-22	06/15/1998	MW-22_06/15/1998	N							20 U		7.4 J	10 U				25 U					16 J
MW-22	06/15/1999	MW-22_06/15/1999	N							400		200					500					110
MW-22	07/15/1999	MW-22_07/15/1999	N							20 U		5.6	10 U				25 U					16
MW-22	07/15/1999	MW-22D_07/15/1999	FD							20 U		4.5 J	10 U				25 U					21
MW-22	09/14/1999	MW-22_09/14/1999	N							12 J		3.9 J	10 U				25 U					10
MW-22	12/01/1999	MW-22_12/01/1999	N							14 J		9.1 J	10 U				3.9 J					11
MW-22	03/25/2000	MW-22_03/25/2000	N							20 U		5.7 J	10 U				5.3					12
MW-22	06/15/2000	MW-22_06/15/2000	N							20 U		6.2 J	10 U				3.3 J					10
MW-22	09/01/2000	MW-22_09/01/2000	N				150			20 U		16	10 U	5 U		31	14				10 U	16
MW-22	12/01/2000	MW-22_12/01/2000	N							20 U		3.3 J	10 U				2.4 J					6.8 J
MW-22	03/28/2001	MW-22_03/28/2001	N							20 U		4.5 J	10 U				1.3 J					5 U
MW-22	06/06/2001	MW-22_06/06/2001	N							20 U		10 U	10 U				4.8 J					10

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-22	08/25/2001	MW-22_08/25/2001	N							13 J		4.2 J	10 U				4.9 J					60
MW-22	09/12/2001	MW-22_09/12/2001	N							20 U		18	10 U				10					96
MW-22	11/29/2001	MW-22_11/29/2001	N				500			800 U		400 U	10 U	76 J		5 U	21 J				44 J	190 J
MW-22	03/05/2002	MW-22-001_03/05/2002	N									149	10 U				123					734
MW-22	06/11/2002	MW-22-002_6/11/02	N							3.7		10 U					26.9					36.1
MW-22	08/06/2002	MW-22-RS_8/6/02	N							3.1			10 U			56.2					179	
MW-22	09/19/2002	MW-22-003	N							13.9		20 U	10 U				20.3					119
MW-22	12/12/2002	MW-22_12/12/02_LS	N							3.5		20 U	10 U				17.5 J					118
MW-22	03/19/2003	MW-22-005	N							16.9		11 U	10 U				27.8 U					160
MW-22	06/10/2003	MW-22-006	N				500 U			5 J		10 U	10 U				28.1					118
MW-22	09/10/2003	MW-22-007	N							2.1		11 U	0.2 U				27.3					28.8
MW-22	12/11/2003	MW-22-009	N							10.4		10 U	0.2 U				20 U					62.4
MW-22	03/19/2004	MW-22-018	N							2.2		10 U	5 U				20 U					58.5
MW-22	06/07/2004	MW-22-030	N				110			2.2		10.4 U	2 U				20 U					48.7 U
MW-22	09/23/2004	MW-22-043	N							6.6			2 U									
MW-22	12/16/2004	MW-22-049	N							7			1 UJ									
MW-22	03/10/2005	MW-22-056	N							1 U			2 U									
MW-22	06/17/2005	MW-22-070	N							1 U			1 U									
MW-22	10/04/2005	MW-22-081	N							1 UJ			2 U									
MW-22	12/16/2005	MW-22-087	N							1 U			2 U									
MW-22	03/15/2006	MW-22-093	N							1 U			2 U									
MW-22	05/03/2006	MW-22-098	N							1 U			1 UJ									
MW-22	10/13/2006	MW-22-110	N							1 U			1 U									
MW-22	03/08/2007	MW-22-121	N							1 U			1 U									
MW-22	10/10/2007	MW-22-136	N							1 U			1 U									
MW-22	12/17/2007	MW-22-138	N	3 U	11.7		300 U	1 U	2 U	1.5	5	10 U		2 U	0.2 U	31.6	20 U	5 U	5 U	1 U	5 U	20 U
MW-22	03/11/2008	MW-22-141	N	3 U	5.51		300 U	1 U	2 U	1 U	5 U	22.6		2 U	0.2 U	36.4	20 U	5 U	5 U	1 U	5 U	20 U
MW-22	07/29/2008	MW-22-143R	N	3 U	13.8		300 U	1 U	2 U	1 U	5 U	10 U		2 U	0.4 J	48.2	20 U	3.81 U	5 U	1 U	5 U	20 U
MW-23	06/15/1998	MW-23_06/15/1998	N							20 U		10 U	10 U				25 U					8.3 J
MW-23	06/15/1999	MW-23_06/15/1999	N							200		100	10 U				250					53
MW-23	09/14/1999	MW-23_09/14/1999	N							20 U		4.8 J	10 U				25 U					6.8
MW-23	12/01/1999	MW-23_12/01/1999	N							20 U		7.1 J	10 U				25 U					9.2 J
MW-23	03/25/2000	MW-23_03/25/2000	N							20 U		5.5 J	10 U				1.5 J					6.6 J
MW-23	06/14/2000	MW-23_06/14/2000	N							20 U		5.3 J	10 U				1.9 J					11
MW-23	09/01/2000	MW-23_09/01/2000	N				5300			20 U		10 U	10 U	5 U		0.85 J	11				2 J	10
MW-23	12/01/2000	MW-23_12/01/2000	N							20 U		6.1 J	10 U				2.1 J					44

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-23	03/28/2001	MW-23_03/28/2001	N							20 U		3.1 J	10 U				25 U					7.8 J
MW-23	06/06/2001	MW-23_06/06/2001	N							20 U		3.2 J	10 U				2.6 J					40
MW-23	09/12/2001	MW-23_09/12/2001	N							20 U		10 U	10 U				2.8 J					51
MW-23	11/30/2001	MW-23_11/30/2001	N				280			800 U		400 U	10 U	27		5 U	15 J				16	120
MW-23	03/08/2002	MW-23-001_03/08/2002	N									11.1	10 U				33.1					93.5
MW-23	06/13/2002	MW-23-002_6/13/02	N							3.6		47.5	10 U				18.9					255
MW-23	09/18/2002	MW-23-003	N							7.2		20 U	10 U				30.8					221
MW-23	12/11/2002	MW-23_12/11/02_LS	N							9.5		20 U	10 U				32					817
MW-23	03/21/2003	MW-23-005	N							11.9		11 U	10 U				29.7					531
MW-23	06/12/2003	MW-23-006	N				500 U			1.1 J		10 U	10 U				34.9					227
MW-23	09/10/2003	MW-23-007	N							1 U		11 U	0.2 U				24.8 J					36.7
MW-23	12/11/2003	MW-23-009	N							3.3		10 U	0.2 U				20 U					48.8
MW-23	03/16/2004	MW-23-018	N							1 U		10 U	3.3 J				20 U					80.4
MW-23	06/08/2004	MW-23-030	N				89			10.5		10.4 U	10.1				20 U					40.5 U
MW-23	09/21/2004	MW-23-043	N							7.9			6.8									
MW-23	12/17/2004	MW-23-049	N							1.5			1.1									
MW-23	03/08/2005	MW-23-056	N							2.9			1 U									
MW-23	06/14/2005	MW-23-070	N							7.7			8.9									
MW-23	10/04/2005	MW-23-081	N							1 U			1 U									
MW-23	12/14/2005	MW-23-087	N							10.5			8.8									
MW-23	03/08/2006	MW-23-093	N							1 U			11.9									
MW-23	05/02/2006	MW-23-098	N							18.2			16.8									
MW-23	10/04/2006	MW-23-110	N							14.4			15.2									
MW-23	12/12/2006	MW-23-115	N							1 UJ												
MW-23	12/12/2006	MW-91-115	FD							8.6 J			14.4 J									
MW-23	03/06/2007	MW-23-121	N							1020			1020									
MW-23	05/02/2007	MW-23-125	N							10.9			13									
MW-23	10/04/2007	MW-23-136	N							22.2			19.2									
MW-23	12/11/2007	MW-23-138	N	3 U	5 U		300 U	1 U	2 U	40.1	5 U	10 U		2 U	0.2 U	5 U	20 U	6.1	5 U	1 U	5 U	20 U
MW-23	03/10/2008	MW-23-141	N	3 U	5 U		300 U	1 U	2 U	24.3	5 U	10 U		2 U	0.2 U	6.01	20 U	5.44	5 U	1 U	5 U	20 U
MW-23	03/11/2008	MW-23-141-2	N	3 U	5 U		300 U	1 U	2 U	39.6	5 U	10 U		4.26	0.2 U	5 U	20 U	6.14	5 U	1 U	5 U	20 U
MW-23	05/06/2008	MW-23-143	N	5 U	5 U		500 U	1 U	2 U	22	5 U	10 U	22.2	5 U	0.2 U	15	20 U	10.9	5 U	2 U	5 U	21
MW-23	05/06/2008	MW-90-143	FD	5 U	5 U		500 U	1 U	2 U	23	5 U	10 U	23.2	5 U	0.2 U	14	20 U	7.68	5 U	1 U	5 U	23
MW-24A	06/15/1998	MW-24A_06/15/1998	N							2900		10 U	2800				25 U					5.6 J
MW-24A	06/15/1999	MW-24A D_06/15/1999	FD							3500		10 U	2960				25 U					26
MW-24A	06/15/1999	MW-24A_06/15/1999	N							3700		5.2 J	2930				25 U					32

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-24A	09/14/1999	MW-24A_09/14/1999	N							4000		10 U	3770				25 U					26
MW-24A	12/03/1999	MW-24A_12/03/1999	N							3900		4.2 J	3670				5					74
MW-24A	03/25/2000	MW-24A_03/25/2000	N							3200		76	3670				4.5 J					94
MW-24A	06/13/2000	MW-24A_06/13/2000	N							3400		2.7 J	3420				1.9 J					20
MW-24A	09/01/2000	MW-24A_09/01/2000	N				41			4000		10 U	3870	5 U		21	5.4				15	18
MW-24A	12/01/2000	MW-24A_12/01/2000	N							3600		4.1 J	3750				6					28
MW-24A	03/28/2001	MW24A_03/28/2001	N							3000		10 U	3220				2.8 J					17
MW-24A	06/06/2001	MW24A_06/06/2001	N							2900		3.1 J	3240				4.2 J					22
MW-24A	09/12/2001	MW-24A_09/12/2001	N							3200		7.1 J	3500				1.3 J					31
MW-24A	11/29/2001	MW-24A_11/29/2001	N				26			2900		6.1 J	3400	5 U		15	2 J				12	58
MW-24A	03/08/2002	MW-24A-001_03/08/2002	N									9.2	3030				5.3					32.7
MW-24A	06/13/2002	MW-24A-002_6/13/02	N							3020		10 U	2870				5 U					41.2
MW-24A	09/17/2002	MW-24A-003	N							3490		20 U	3290				5 U					308
MW-24A	12/11/2002	MW-24A_12/11/02_LFD	FD							4160		20 U	3430				27.8 U					69.3 J
MW-24A	12/11/2002	MW-24A_12/11/02_LS	N							4100		20 U	3400				27.8 U					122 J
MW-24A	03/18/2003	MW-24A-005	N							2610		11 U	2770				27.8 U					620
MW-24A	06/12/2003	MW-24-A-006	N				500 U			2510		10 U	2640 J				26.1 U					326
MW-24A	09/11/2003	MW-24A-007	N							2620		15.2	2970				22.5 J					33.7
MW-24A	09/11/2003	MW-91-007	FD							2740		11 U	3060				26.1 U					49.9
MW-24A	12/10/2003	MW-24A-009	N							3320		10 U	2990				20 U					64.1
MW-24A	12/10/2003	MW-92-009	FD							4080		10 U	3030				20 U					60.6
MW-24A	03/17/2004	MW-24A-018	N							2270		10 U	2600				20 U					139 J
MW-24A	03/17/2004	MW-92-018	FD							1970		10 U	2440				20 U					186
MW-24A	06/08/2004	MW-24A-030	N				38			2390		10.4 U	2660				20 U					54.1 U
MW-24A	09/20/2004	MW-24A-043	N							2960			2960									
MW-24A	12/17/2004	MW-24A-049	N							2890												
MW-24A	01/11/2005	MW-24A-049R	N										3040									
MW-24A	03/07/2005	MW-24A-056	N							3180			3390									
MW-24A	03/07/2005	MW-94-056	FD							3290			3360									
MW-24A	06/16/2005	MW-24A-070	N							2640			3280									
MW-24A	10/03/2005	MW-24A-081	N							2930			3120									
MW-24A	10/03/2005	MW-91-081	FD							2630			3040									
MW-24A	03/06/2006	MW-24A-093	N							3980			3490									
MW-24A	10/03/2006	MW-24A-110	N							4260			4300									
MW-24A	12/14/2006	MW-24A-115	N							4250			3310									
MW-24A	03/06/2007	MW-24A-121	N							3600			3540									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-24A	07/18/2007	MW-24A_071807	N			5.4				2550			2480									
MW-24A	12/12/2007	MW-24A-138	N		3 U	5 U	300 U	1 U	2 U	3300	5 U	10 U		2 U	0.2 U	39.7	20 U	5 U	5 U	1 U	27.3	20 U
MW-24A	03/12/2008	MW-24A-141	N		3 U	10.8	300 U	1 U	2 U	2000	5 U	10 U		2 U	0.2 U	29.6	20 U	50.7	5 U	1 U	7.18	20 U
MW-24A	05/08/2008	MW-24A-143	N		5 U	33.6	944	1 U	2 U	10	5 U	10 U		5 U	0.2 U	11	20 U	5.29	5 U	1 U	5 U	20 U
MW-24B	06/15/1998	MW-24B_06/15/1998	N							3710		10 U	3410				25 U					5 U
MW-24B	06/15/1999	MW-24B_06/15/1999	N							3500		10 U	3120				25 U					25
MW-24B	09/14/1999	MW-24B_09/14/1999	N							3800		10 U	3670				25 U					14
MW-24B	12/03/1999	MW-24B_12/03/1999	N							2800		4.1 J	3050 J				5					30
MW-24B	03/25/2000	MW-24B_03/25/2000	N							3400		2.6 J	3730				5					22
MW-24B	06/15/2000	MW-24B_06/15/2000	N							3800		4.2 J	3900				1.8 J					16
MW-24B	09/01/2000	MW-24B_09/01/2000	N				36			4400		19	3970	5 U		63	53				2.4 J	120
MW-24B	12/01/2000	MW-24B_12/01/2000	N							680		4.3 J	741				2.3 J					30
MW-24B	03/28/2001	MW24B_03/28/2001	N							3400		10 U	3960				1.2 J					9.6 J
MW-24B	06/06/2001	MW24B_06/06/2001	N							3500		10 U	4150				4.1 J					30
MW-24B	08/25/2001	MW24B_08/25/2001	N							4000		3.7 J	4540				0.91 J					63
MW-24B	09/12/2001	MW-24B_09/12/2001	N							3900		4 J	4700				0.69 J					28
MW-24B	11/29/2001	MW-24B_11/29/2001	N				28 J			4400		400 U	4400	5 U		53	400 U				10 U	5 U
MW-24B	03/08/2002	MW-24B-001_03/08/2002	N									13.6	4920				10.5					71.6
MW-24B	06/13/2002	MW-24B-002_6/13/02	N							5120		10 U	4830				7.1					39.5
MW-24B	12/10/2002	MW-24B_12/10/02_LS	N							5380		20 U	4620				27.8 U					300
MW-24B	03/18/2003	MW-24B-005	N							4650		11 U	4900				27.8 U					468
MW-24B	06/12/2003	MW-24B-006	N				500 U			5570		10 U	4790				31.3					307
MW-24B	09/11/2003	MW-24B-007	N							4320		11 U	4760				26.1 U					29.3
MW-24B	12/10/2003	MW-24B-009	N							6050		10 U	4840				20 U					44
MW-24B	03/17/2004	MW-24B-018	N							3900		10 U	4860				20 U					76.8
MW-24B	06/08/2004	MW-24B-030	N				34			4910		10.4 U	5190				20 U					80.5 U
MW-24B	09/21/2004	MW-24B-043	N							4940			5100									
MW-24B	12/17/2004	MW-24B-049	N							4470												
MW-24B	12/17/2004	MW-91-049	FD							4420			4790									
MW-24B	01/11/2005	MW-24B-049R	N										5260									
MW-24B	03/07/2005	MW-24B-056	N							4950			5320									
MW-24B	06/16/2005	MW-24B-070	N							5660			5640									
MW-24B	10/03/2005	MW-24B-081	N							4930			5240									
MW-24B	03/07/2006	MW-24B-093	N							5970			5650									
MW-24B	05/04/2006	MW-24B-CIS	N	50 U	2 U	8.43	38.5	1 U	1 U	6260	1 U	1 U	5760	1 U	0.2 U	64.9	1 U	14.3	1 U	1 U	8.13	12.7
MW-24B	05/04/2006	MW-90-CIS	FD	50 U	2 U	8.34	38.6	1 U	1 U	6200	1 U	1 U	5760	1 U	0.2 U	64.4	1 U	14.1	1 U	1 U	8.21	11.2

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-24B	10/03/2006	MW-24B-110	N							5830			6120									
MW-24B	12/14/2006	MW-24B-115	N							5060			5520									
MW-24B	03/05/2007	MW-24B-121	N							6100			5980									
MW-24B	07/18/2007	MW-24B_071807	N			7.13				6020			5540									
MW-24BR	06/15/1998	MW-24BR_06/15/1998	N							380		10 U	302				25 U					5 UJ
MW-24BR	06/15/1998	MW-24BRD_06/15/1998	FD							150		10 U	346				25 U					9 J
MW-24BR	06/15/1999	MW-24BR_06/15/1999	N							20 U		6.2 J	10 U				25 U					15
MW-24BR	09/14/1999	MW-24BR_09/14/1999	N							17 J		10 U	10 U				25 U					15
MW-24BR	12/03/1999	MW-24BR_12/03/1999	N							20 U		12	10 UJ				1.7 J					18
MW-24BR	03/25/2000	MW-24BR_03/25/2000	N							10 J		5.5 J	10 U				2 J					110
MW-24BR	06/15/2000	MW-24BR_06/15/2000	N							20 U		2.5 J	10 U				1.8 J					18
MW-24BR	09/01/2000	MW-24BR_09/01/2000	N				300			20 U		10 U	10 U	5 U		58	10				2.3 J	10
MW-24BR	12/01/2000	MW-24BR_12/01/2000	N							20 U		4.8 J	10 U				4.1 J					55
MW-24BR	03/28/2001	MW24BR_03/28/2001	N							20 U		10 U	10 U				1.8 J					19
MW-24BR	06/06/2001	MW24BR_06/06/2001	N							10 J		4 J	10 U				3.4 J					44
MW-24BR	09/12/2001	MW-24BR_09/12/2001	N							20 U		38	10 U				3.4 J					120
MW-24BR	11/29/2001	MW-24BR_11/29/2001	N				200			800 U		400 U	10 U	5 U		36	8.5 J				10 U	5 U
MW-24BR	03/08/2002	MW-24BR-001_03/08/20(	N									65.5	10 U				17.2					133
MW-24BR	06/13/2002	MW-24BR-002_6/13/02	N							3.7		10 U	10 U				5 U					52.8
MW-24BR	09/18/2002	MW-24BR-003	N							3.5		20 U	10 U				6.3					152
MW-24BR	12/12/2002	MW-24BR_12/12/02_LS	N							3.4		20 U	10 U				27.8 U					66.2
MW-24BR	03/19/2003	MW-24BR-005	N							16		11 U	10 U				27.8 U					111
MW-24BR	06/13/2003	MW-24BR-006	N				500 U			2.9 J		10 U	10 U				26.1 U					126
MW-24BR	09/12/2003	MW-24BR-007	N							3.6 J		11 U	0.2 U				26.1 U					72.4
MW-24BR	12/11/2003	MW-24BR-009	N							4.6		10 U	0.2 U				20 U					20 U
MW-24BR	03/17/2004	MW-24BR-018	N							4.8		10 U	1 UJ				20 U					146 J
MW-24BR	06/08/2004	MW-24BR-030	N				190			1 U		10.4 U	1 U				20 U					73.9 U
MW-24BR	09/21/2004	MW-24BR-043	N							1 U			1 U									
MW-24BR	12/17/2004	MW-24BR-049	N							3.5			1 U									
MW-24BR	03/08/2005	MW-24BR-056	N							1 U			1 U									
MW-24BR	12/15/2005	MW-24BR-087	N							1 U			1 U									
MW-24BR	03/16/2006	MW-24BR-093	N							1.2			1 U									
MW-24BR	05/10/2006	MW-24BR-098	N							1 U												
MW-24BR	06/05/2006	MW-24BR-098RE	N										1 U									
MW-24BR	11/01/2006	MW-24BR-110	N							1 U			1 U									
MW-24BR	12/15/2006	MW-24BR-115	N							1			2 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-24BR	03/06/2007	MW-24BR-121	N							1 U			1 U									
MW-24BR	05/03/2007	MW-24BR-125	N							1 U			1 U									
MW-24BR	10/04/2007	MW-24BR-136	N							1 U			1 U									
MW-24BR	05/08/2008	MW-24BR-143	N							2.4			1 U									
MW-25	06/15/1999	MW-25_06/15/1999	N				38			2900		10 U	2340	5 U		17	25 U				12	27
MW-25	09/14/1999	MW-25_09/14/1999	N							2600		10 U	2480				25 U					15
MW-25	12/03/1999	MW-25_12/03/1999	N							2900		3.4 J	2830				5					16
MW-25	06/14/2000	MW-25_06/14/2000	N							2800		12	2920				2.5 J					40
MW-25	09/01/2000	MW-25_09/01/2000	N				42			2900		5.5 J	2710	5 U		9.700001	4.4 J				5.1 J	17
MW-25	12/01/2000	MW-25_12/01/2000	N							2800		20	2730				2.1 J					100
MW-25	03/28/2001	MW-25_03/28/2001	N							2700		10 U	2690				25 U					7.3 J
MW-25	06/06/2001	MW-25_06/06/2001	N							2500		10 U	2910				2.1 J					10
MW-25	09/12/2001	MW-25_09/12/2001	N							2500		10 U	2600				3.1 J					26
MW-25	11/29/2001	MW-25_11/29/2001	N				38			2600		400 U	2400	5 U		5.6	3.8 J				7.7 J	31
MW-25	03/07/2002	MW-25-001_03/07/2002	N									7.6	2980				8.9					68.2 J
MW-25	03/07/2002	MW-51-001_03/07/2002	FD									5.8	2980				8.6					28.4 J
MW-25	06/12/2002	MW-25-002_6/12/02	N							3050		10 U	2870				6.8					63.9
MW-25	09/17/2002	MW-25-003	N							2790		27.8 U	2560				21.3					145
MW-25	12/10/2002	MW-25_12/10/02_LS	N							3220		20 U	2430				27.8 U					167
MW-25	03/21/2003	MW-25-005	N							2130		11 U	2530				27.8 U					325
MW-25	06/12/2003	MW-25-006	N				500 U			2720		10 U	2440				26.1 U					334 J
MW-25	06/12/2003	MW-42-006	FD				500 U			3410		10 U	2480				26.1 U					555 J
MW-25	09/12/2003	MW-25-007	N							2080		11 U	2350				26.1 U					76.7
MW-25	12/12/2003	MW-25-009	N							3220		10 U	2210				20 U					25.2
MW-25	03/03/2004	MW-25-016	N							2020			2270									
MW-25	03/17/2004	MW-25-018	N							1920		10 U	2180				20 U					78.2
MW-25	03/17/2004	MW-90-018	FD							1940		10 U	2440				20 U					75.8
MW-25	05/14/2004	MW-25-026	N							1970			2300									
MW-25	06/09/2004	MW-25-030	N	50 U	4.2 U	10 U	37	3 U	3 U	2150	3 U	10.4 U	2260	5 U	0.5 U	10 U	20 U	10 U	3 U	5 U	3 U	63 U
MW-25	06/09/2004	MW-25-030	N		25 U					2100		5 U					5 U					10
MW-25	09/22/2004	MW-25-043	N	500 U	5 U	10 U	40.7	3 U	3 U	1930	3 U	7.1	1970	5 U	0.2 U	5 U	5 U	13.1	3 U	15 U	3 U	22.7
MW-25	09/22/2004	MW-25-043	N							1940												
MW-25	03/09/2005	MW-25-056	N	52 U	5 U	10 U	39.5	3.1 U	3.1 U	1700	3.1 U	5 U	1740	2.1 U	0.2 U	5 U	5 U	10 U	3.1 U	15 U	73.3	94.6
MW-25	03/09/2005	MW-25-056	N							1600												
MW-25	04/07/2005	MW-25-060	N							1700			1620									
MW-25	06/14/2005	MW-25-070	N	50 U	2 U	1.81	45.5	1 U	1 U	1790	1 U	1 U	1730	1 U	0.2 U	3.85	2.26	2.72	1 U	1 U	11.1	119 J

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-25	06/14/2005	MW-25-070	N							1670												
MW-25	06/14/2005	MW-93-070	FD	50 U	2 U	1.93	48.9	1 U	1 U	1660	1 U	1.34	1760	1 U	0.2 U	4.13	1.68	2.65	1 U	1 U	11.8	16.1 J
MW-25	06/14/2005	MW-93-070	FD							1930												
MW-25	10/04/2005	MW-25-081	N		2 U	1.94	300 U	1 U	1 U	1470	1 U	10.4 U	1540	1 U	0.2 U	3.49	20 U	2.38	1 U	1 U	6	20 U
MW-25	10/04/2005	MW-92-081	FD		2 U	2.15	300 U	1 U	1 U	1480	1 U	10.4 U	1540	1 U	0.2 U	3.53	20 U	2.35	1 U	1 U	6.6	20 U
MW-25	12/14/2005	MW-25-087	N	52 U	3 U	5 U	300 U	1 U	2 U	1370	5 U	10 U	1460	2 U	0.2 U	5 U	20 U	5 U	5 U	1 U	9.7	20 U
MW-25	12/14/2005	MW-92-087	FD	52 U	3 U	5 U	300 U	1 U	2 U	1350	5 U	10 U	1450	2 U	0.2 U	5 U	20 U	5 U	5 U	1 U	9.4	20 U
MW-25	03/09/2006	MW-25-093	N		2 U	2.39	40.8	1 U	1 U	1430	1 U	1 U	1360	1 U	0.2 U	3.34	1.58	2.38	1 U	1 U	11.8	10 U
MW-25	05/03/2006	MW-25-098	N							1300			1390									
MW-25	05/03/2006	MW-25-CIS	N	50 U	2 U	2.12	42	1 U	1 U		1 U	1 U		1 U	0.2 U	3.35	1.25	2.64	1 U	1 U	11.6	10 U
MW-25	05/03/2006	MW-92-098	FD		2 U	2.07	43.2	1 UJ	1 U	1310	1 U	1 U	1280	1 U	0.2 U	3.39	1.36	2.57	1 U	1 U	12	10 U
MW-25	10/03/2006	MW-25-110	N		2 U	2.08	39.6	1 U	1 U	1150	1 U	1 U	1140	1 U	0.2 U	3.5	3.62	2.37	1 U	1 U	11.2	10 U
MW-25	03/06/2007	MW-25-121	N		2 U	1.91	41.3	1 U	1 U	951	1 U	1 U	945	1 U	0.2 U	3.36	1.22	2.04	1 U	1 U	11.1	10 U
MW-25	10/02/2007	MW-25-136	N							805			895									
MW-25	10/02/2007	MW-91-136	FD							884			933									
MW-26	06/09/1999	MW-26_06/09/1999	N				36			860	6 J		831	2.1 J		32	25 U				10 U	81
MW-26	06/15/1999	MW-26D_06/15/1999	FD							760	5.9 J		759				25 U					13
MW-26	09/14/1999	MW-26_09/14/1999	N							1200	4 J		1130				25 U					18.8
MW-26	12/03/1999	MW-26_12/03/1999	N							1400	4.9 J		1470 J				1.7 J					49
MW-26	03/25/2000	MW-26_03/25/2000	N							1400	4.5 J		10 U				2.6 J					37
MW-26	06/15/2000	MW-26_06/15/2000	N							1100	4.8 J		1200				5					8.8 J
MW-26	09/01/2000	MW-26_09/01/2000	N				39			1400	8.2 J		1370	5 U		30	2.8 J				2.4 J	110
MW-26	12/01/2000	MW-26_12/01/2000	N							2300	17		2420				1.8 J					140
MW-26	03/28/2001	MW-26_03/28/2001	N							2300	3.9 J		2390				25 U					12
MW-26	06/06/2001	MW-26_06/06/2001	N							2800	6.7 J		2740				9.5					39
MW-26	09/12/2001	MW-26_09/12/2001	N							2900	3.7 J		3400				1.4 J					26
MW-26	11/30/2001	MW-26_11/30/2001	N				170			3500	7.5 J		3200	5 U		29	9 J				17	140
MW-26	03/07/2002	MW-26-001_03/07/2002	N								34.2		3590				17.2 J					73.3
MW-26	06/13/2002	MW-26-002_6/13/02	N							3680	10 U		3620				5.5					35.2
MW-26	09/18/2002	MW-26-003	N							3110	27.8 U		3720				18.3					218
MW-26	12/11/2002	MW-26_12/11/02_LS	N							5020	20 U		3860				27.8 U					144
MW-26	03/20/2003	MW-26_03/20/2003_LFD	FD							2790	11 U		3280				27.8 U					356
MW-26	03/20/2003	MW-26-005	N							2750	11 U		3280				27.8 U					514
MW-26	06/11/2003	MW-26-006	N				500 U			3110	10 U		3680				26.1 U					80.6
MW-26	09/09/2003	MW-26-007	N							3340	11 U		3510				26.1 U					24.2 J
MW-26	12/10/2003	MW-26-009	N							5000	10 U		3890				20 U					436

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-26	03/03/2004	MW-26-016	N							3150			3720									
MW-26	03/16/2004	MW-26-018	N							3580		10 U	3970				20 U					167
MW-26	05/14/2004	MW-26-026	N							4240			4060									
MW-26	06/08/2004	MW-26-030	N							3650		10.4 U	3890				20 U					76.9 U
MW-26	06/08/2004	MW-91-030	FD							3610		10.4 U	4000				20 U					66.5 U
MW-26	09/22/2004	MW-26-043	N							3710			3670									
MW-26	12/16/2004	MW-26-049	N							3800			3790									
MW-26	03/08/2005	MW-26-056	N							3160			2990									
MW-26	03/08/2005	MW-95-056	FD							3050			2990									
MW-26	06/13/2005	MW-26-070	N							3140			3370									
MW-26	10/04/2005	MW-26-081	N							2990			3040									
MW-26	12/12/2005	MW-26-087	N							3160			3220									
MW-26	03/08/2006	MW-26-093	N							3020			3280									
MW-26	05/01/2006	MW-26-098	N							3110			3210									
MW-26	10/03/2006	MW-26-110	N							3850			3590									
MW-26	03/12/2007	MW-26-121	N							3540			3440		0.2 U							
MW-26	10/02/2007	MW-26-136	N							3740			3510									
MW-26	12/11/2007	MW-26-138	N	3 U	5 U	300 U	1 U	2 U		2980	5 U	10 U		2 U	0.2 U	34	20 U	14.4	5 U	1 U	5.9	20 U
MW-26	03/12/2008	MW-26-141	N	3 U	5 U	300 U	1 U	2 U		2560	5 U	10 U		2 U	0.2 U	28.8	20 U	14.8	5 U	1 U	6.14	21.3
MW-26	03/12/2008	MW-90-141	FD	3 U	5 U	300 U	1 U	2 U		2640	5 U	10 U		2 U	0.2 U	27.7	20 U	13.3	5 U	1 U	5.88	20 U
MW-26	05/05/2008	MW-26-143	N	3 U	5 U	500 U	1 U	2 U		2600	5 U	10 U		5 U	0.2 U	43	20 U	16.8	5 U	1 U	5 U	37.3
MW-27-20	06/15/1999	MW-27_06/15/1999	N			69				20 U		8.9 J	10 U	3.4 J		6.4	25 U				10 U	11
MW-27-20	09/14/1999	MW-27_09/14/1999	N							20 U		10 U	10 U				25 U					5.3
MW-27-20	09/14/1999	MW-27D_09/14/1999	FD							20 U		10 U	10 U				25 U					5.3
MW-27-20	12/01/1999	MW-27_12/01/1999	N							20 U		8.2 J	10 U				3.7 J					8.7 J
MW-27-20	12/01/1999	MW-27D_12/01/1999	FD							20 U		7.8 J	10 U				5					16
MW-27-20	03/23/2000	MW-27_03/23/2000	N							20 U		10 U	10 U				5					7.5 J
MW-27-20	03/23/2000	MW-27D_03/23/2000	FD							20 U		10 U	10 U				3.6 J					14
MW-27-20	06/15/2000	MW-27_06/15/2000	N							20 U		4.3 J	10 U				6.8					10
MW-27-20	06/15/2000	MW-27D_06/15/2000	FD							20 U		6.1 J	10 U				110					10
MW-27-20	09/01/2000	MW-27_09/01/2000	N			100				20 U		4 J	10 U	1.7 J		6.1	2.4 J				0.96 J	3.9 J
MW-27-20	09/01/2000	MW-27D_09/01/2000	FD			100				20 U		5 J	10 U	5 U		6.2	2.4 J				0.85 J	10
MW-27-20	12/01/2000	MW-27_12/01/2000	N							20 U		4.9 J	10 U				5					7.3 J
MW-27-20	12/01/2000	MW-27D_12/01/2000	FD							20 U		7.5 J	10 U				5					12
MW-27-20	03/28/2001	MW27_03/28/2001	N							20 U		3.3 J	10 U				2.1 J					5 U
MW-27-20	06/06/2001	MW27_06/06/2001	N							20 U		3.6 J	10 U				4 J					11

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-27-20	08/25/2001	MW27_08/25/2001	N							20 U		4.6 J	10 U				1.4 J					59
MW-27-20	09/12/2001	MW-27_09/12/2001	N							20 U		12	10 U				2.6 J					37
MW-27-20	11/29/2001	MW-27_11/29/2001	N				260			14 J		21	10 U	24		6.7	12				21	120
MW-27-20	11/29/2001	MW-27D_11/29/2001	FD							13 J		20	10 U				12					77
MW-27-20	03/05/2002	MW-27-001_03/05/2002	N									96.1	10 U				63.5					440
MW-27-20	06/11/2002	MW-27-002_6/11/02	N							5.1		10 U					6.7					40.5
MW-27-20	08/06/2002	MW-27-RS_8/6/02	N							3.8			10 U									
MW-27-20	09/19/2002	MW-27-003	N							1.1 U		20 U	10 U				5 U					164
MW-27-20	12/12/2002	MW-27_12/12/02_LS	N							5.6		20 U	10 U				27.8 U					213
MW-27-20	03/19/2003	MW-27-005	N							11.5		11 U	10 U				27.8 U					105
MW-27-20	06/10/2003	MW-27-006	N				500 U			10.5		10 U	10 U				26.1 U					285
MW-27-20	09/10/2003	MW-27-007	N							1 U		11 U	0.2 U				26.1 U					22.7 J
MW-27-20	11/04/2003	MW-27-008	N							1 U			0.2 U									
MW-27-20	12/11/2003	MW-27-009	N							1		10 U	0.2 U				20 U					20 U
MW-27-20	01/13/2004	MW-27-010	N							1 U			0.2 U									
MW-27-20	01/29/2004	MW-27-011	N							1.5			0.2 U									
MW-27-20	02/05/2004	MW-27-012	N							1 U			0.2 U									
MW-27-20	02/12/2004	MW-27-013	N							1 U			0.2 U									
MW-27-20	02/19/2004	MW-27-WV-014	N	50 U						1 U			0.2 U									
MW-27-20	02/26/2004	MW-27-015	N							1 U			0.2 U									
MW-27-20	03/03/2004	MW-27-016	N							1.9			0.2 U									
MW-27-20	03/10/2004	MW-27-017	N							1 U			0.2 U									
MW-27-20	03/17/2004	MW-27-018	N							1.2 U		10 U	0.2 U				20 U					194 U
MW-27-20	03/24/2004	MW-27-019	N							1 U			0.2 U									
MW-27-20	03/31/2004	MW-27-020	N							1 U			0.2 U									
MW-27-20	04/07/2004	MW-27-021	N							1 U			0.2 U									
MW-27-20	04/13/2004	MW-27-022	N							1 U			0.2 U									
MW-27-20	04/21/2004	MW-27-023	N							1 U			0.2 U									
MW-27-20	04/28/2004	MW-27-024	N							1 UJ			0.2 U									
MW-27-20	05/05/2004	MW-27-025	N							1 U			0.2 U									
MW-27-20	05/12/2004	MW-27-026	N							1 U			1 U									
MW-27-20	05/19/2004	MW-27-027	N							1 U			0.2 U									
MW-27-20	05/26/2004	MW-27-028	N							1 U			0.2 U									
MW-27-20	06/02/2004	MW-27-029	N							1 U			0.2 U									
MW-27-20	06/08/2004	MW-27-030	N							1 U		10.4 U	0.2 U				20 U					35.3 U
MW-27-20	06/17/2004	MW-27-031	N							1 U			0.2 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-27-20	06/23/2004	MW-27-032	N							1 U			0.2 U									
MW-27-20	06/30/2004	MW-27-033	N							1 U			0.2 U									
MW-27-20	07/07/2004	MW-27-034	N							1 U			0.2 U									
MW-27-20	07/13/2004	MW-27-035	N							1 U			0.2 U									
MW-27-20	07/21/2004	MW-27-036	N							1 U			0.2 U									
MW-27-20	07/27/2004	MW-27-037	N							1 U			0.2 U									
MW-27-20	08/04/2004	MW-27-038	N							1 U			0.2 U									
MW-27-20	08/11/2004	MW-27-039	N							1 U			0.2 U									
MW-27-20	08/19/2004	MW-27-040	N							1 U			0.2 U									
MW-27-20	09/21/2004	MW-27-043	N							1 U			0.2 U									
MW-27-20	10/19/2004	MW-27-045	N							1 U			0.2 U									
MW-27-20	11/15/2004	MW-27-047	N							1 U												
MW-27-20	12/02/2004	MW-27-048	N										0.2 U									
MW-27-20	12/15/2004	MW-27-049	N							1 U			0.2 U									
MW-27-20	01/10/2005	MW-27-051	N							1 U			0.2 U									
MW-27-20	02/09/2005	MW-27-053	N							1 U			0.2 U									
MW-27-20	03/08/2005	MW-27-020-056	N							1 U			0.2 U									
MW-27-20	04/04/2005	MW-27-025-060	N							1 U			0.2 U									
MW-27-20	05/04/2005	MW-27-020-064	N							1 U			0.2 U									
MW-27-20	07/18/2005	MW-27-020-074	N							1 U			0.2 U									
MW-27-20	10/05/2005	MW-27-020-081	N							1 U			0.21 U									
MW-27-20	12/14/2005	MW-27-020-087	N							1 U			0.2 U									
MW-27-20	03/06/2006	MW-27-020-093	N							1 U			0.2 U									
MW-27-20	05/01/2006	MW-27-020-098	N							1 U			0.2 U									
MW-27-20	10/03/2006	MW-27-020-110	N							1 U			0.2 U									
MW-27-20	10/02/2007	MW-27-020-136	N							2.2			0.2 U									
MW-27-60	02/23/2005	MW-27-60-054	N				500 U			1 U			1 U									
MW-27-60	02/23/2005	MW-91-054	FD				500 U			1 U			1 U									
MW-27-60	03/01/2005	MW-27-060-055	N							1 UJ			1 U									
MW-27-60	03/08/2005	MW-27-060-056	N							1 U			1 U									
MW-27-60	03/14/2005	MW-27-060-057	N							1 U			1 U									
MW-27-60	03/14/2005	MW-27-60-057	N				500 U															
MW-27-60	03/23/2005	MW-27-060-058	N							1 U			1 U									
MW-27-60	03/29/2005	MW-27-060-059	N							1 U			1 U									
MW-27-60	04/05/2005	MW-27-60-060	N							1 U			1 U									
MW-27-60	04/12/2005	MW-27-060-061	N							1 U			1 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-27-60	04/19/2005	MW-27-060-062	N							1 U			1 U									
MW-27-60	04/26/2005	MW-27-060-063	N							1 U			1 U									
MW-27-60	05/04/2005	MW-27-060-064	N							1 U			1 U									
MW-27-60	07/18/2005	MW-27-060-074	N							1.8			1 U									
MW-27-60	10/05/2005	MW-27-060-081	N							1 U			1 U									
MW-27-60	12/15/2005	MW-27-060-087	N							1 U			1 U									
MW-27-60	03/07/2006	MW-27-060-093	N							1 U			1 U									
MW-27-60	05/01/2006	MW-27-060-098	N							1 U			1 U									
MW-27-60	10/03/2006	MW-27-060-110	N							1 U			1 U									
MW-27-60	10/02/2007	MW-27-060-136	N							1 U			0.2 U									
MW-27-85	02/23/2005	MW-27-85-054	N				500 U			1 U			2 U									
MW-27-85	03/01/2005	MW-27-085-055	N							1 UJ			1 U									
MW-27-85	03/08/2005	MW-27-085-056	N							1 U			2 U									
MW-27-85	03/14/2005	MW-27-85-057	N				500 U			1 U			1 U									
MW-27-85	03/23/2005	MW-27-085-058	N							1 U			1 U									
MW-27-85	03/29/2005	MW-27-085-059	N							1 U			1 U									
MW-27-85	04/05/2005	MW-27-85-060	N							1 U			1 U									
MW-27-85	04/12/2005	MW-27-085-061	N							1 U			1 U									
MW-27-85	04/19/2005	MW-27-085-062	N							1 U			1 U									
MW-27-85	04/26/2005	MW-27-085-063	N							1 U			1 U									
MW-27-85	05/04/2005	MW-27-085-064	N							1 U			1 U									
MW-27-85	05/19/2005	MW-27-085-066	N							1 U			1 U									
MW-27-85	06/02/2005	MW-27-85-068	N							1 U			1 U									
MW-27-85	07/19/2005	MW-27-085-074	N							3			1 U									
MW-27-85	08/16/2005	MW-27-085-077	N							2.6 U			1 U									
MW-27-85	09/08/2005	MW-27-085-079	N							1 U			1 U									
MW-27-85	10/05/2005	MW-27-085-081	N							1 U			1 U									
MW-27-85	11/03/2005	MW-27-085-083	N							1 U			2 UJ									
MW-27-85	12/15/2005	MW-27-085-087	N							6.6			1.2 J									
MW-27-85	01/12/2006	MW-27-085-089	N							1 U			1 U									
MW-27-85	02/08/2006	MW-27-085-091	N							1 U			1 U									
MW-27-85	03/06/2006	MW-27-085-093	N							1 U			1 U									
MW-27-85	04/03/2006	MW-27-085-095	N							1 U			1 U									
MW-27-85	05/01/2006	MW-27-085-098	N							1 U			1 U									
MW-27-85	06/14/2006	MW-27-085-102	N							1 U			1 U									
MW-27-85	07/12/2006	MW-27-085-104	N							1 U			2 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-27-85	08/08/2006	MW-27-085-106	N							1 U			1 U									
MW-27-85	09/06/2006	MW-27-085-108	N							1 U			1 U									
MW-27-85	10/13/2006	MW-27-085-110	N							1 U			1 U									
MW-27-85	11/16/2006	MW-27-085-113	N							1 U			1 U									
MW-27-85	12/11/2006	MW-27-085-115	N							1 U			1 U									
MW-27-85	01/10/2007	MW-27-085-117	N							4.4			1 U									
MW-27-85	02/06/2007	MW-27-085-119	N							1 U			1 U									
MW-27-85	03/07/2007	MW-27-085-121	N							1 U			0.2 U									
MW-27-85	04/03/2007	MW-27-085-123	N							1 U			1 U									
MW-27-85	05/01/2007	MW-27-085-125	N							1			1 U									
MW-27-85	06/13/2007	MW-27-085-128	N							1 U			1 U									
MW-27-85	07/11/2007	MW-27-085-130	N							1 U			1 U									
MW-27-85	08/08/2007	MW-27-085-132	N							1 U			1 U									
MW-27-85	08/08/2007	MW-91-132	FD							1 U			1 U									
MW-27-85	09/05/2007	MW-27-085-134	N							1 U			1 U									
MW-27-85	10/02/2007	MW-27-085-136	N							1 U			1 U									
MW-27-85	05/06/2008	MW-27-085-143	N							1 U			1.05 U									
MW-28-25	06/15/1999	MW-28_06/15/1999	N				120			20 U	7.3 J	10 U		3.8 J		7.6	25 U			10 U		8.7
MW-28-25	09/14/1999	MW-28_09/14/1999	N							20 U	10 U	10 U					25 U					5.3
MW-28-25	12/01/1999	MW-28_12/01/1999	N							20 U	4.3 J	10 U					5					7.6 J
MW-28-25	03/23/2000	MW-28_03/23/2000	N							20 U	10 U	10 U					5					6.7 J
MW-28-25	06/15/2000	MW-28_06/15/2000	N							20 U	4.6 J	10 U					5					10
MW-28-25	09/01/2000	MW-28_09/01/2000	N				150			20 U	3.6 J		5 U			5.4	2.2 J			1.4 J		7.9 J
MW-28-25	12/01/2000	MW-28_12/01/2000	N							20 U	4.6 J	10 U					5					6.3 J
MW-28-25	03/28/2001	MW-28_03/28/2001	N							20 U	4.2 J	10 U					25 U					7.9 J
MW-28-25	06/06/2001	MW-28_06/06/2001	N							20 U	2 J	10 U					9.2					45
MW-28-25	06/06/2001	MW-28D_06/06/2001	FD							20 U	3.2 J	10 U					5.3					10
MW-28-25	09/12/2001	MW-28_09/12/2001	N							20 U	7.1 J	10 U					5 J					53
MW-28-25	09/12/2001	MW-28D_09/12/2001	FD							20 U	10 U	10 U					2.9 J					20
MW-28-25	11/29/2001	MW-28_11/29/2001	N				240			800 U	16	10 U		14		5.6	9.7			16		63
MW-28-25	03/05/2002	MW-28-001_03/05/2002	N								26.9	10 U					20.6					143
MW-28-25	06/11/2002	MW-28-002_6/11/02	N							5.6	10 U						7.5					57
MW-28-25	08/06/2002	MW-28-RS_8/6/02	N							3.5		10 U										
MW-28-25	09/19/2002	MW-28-003	N							3.6	20 U	10 U					5 U					96.5
MW-28-25	12/12/2002	MW-28_12/12/02_LS	N							3.9	20 U	10 U					27.8 U					124
MW-28-25	03/20/2003	MW-28-005	N							12.1	11 U	10 U					27.8 U					286

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-28-25	06/10/2003	MW-28-006	N				500 U			12		10 U	10 U				26.1 U					55.3
MW-28-25	09/10/2003	MW-28-007	N							1 U		11 U	0.2 U				26.1 U					39 J
MW-28-25	09/10/2003	MW-92-007	FD							1 U		11 U	0.2 U				26.1 U					124
MW-28-25	11/04/2003	MW-28-008	N							1 U			0.2 U									
MW-28-25	12/11/2003	MW-28-009	N							1 U		10 U	0.2 U				20 U					56.7
MW-28-25	01/13/2004	MW-28-010	N							1.5			0.2 U									
MW-28-25	01/29/2004	MW-28-011	N							1.6			0.2 U									
MW-28-25	02/05/2004	MW-28-012	N							1 U			0.2 U									
MW-28-25	02/12/2004	MW-28-013	N							1 U			0.2 U									
MW-28-25	02/20/2004	MW-28-WV-014	N	50 U						1 U			0.2 U									
MW-28-25	02/26/2004	MW-28-015	N							1 U			0.2 U									
MW-28-25	03/04/2004	MW-28-016	N							2.1 U			0.2 U									
MW-28-25	03/10/2004	MW-28-017	N							1.2 U			0.2 U									
MW-28-25	03/17/2004	MW-28-018	N							1.2 U		10 U	0.2 U				20 U					168 U
MW-28-25	03/24/2004	MW-28-019	N							1 U			0.2 U									
MW-28-25	03/31/2004	MW-28-020	N							1 U			0.2 U									
MW-28-25	04/07/2004	MW-28-021	N							2.9			0.2 U									
MW-28-25	04/13/2004	MW-28-022	N							1.2			0.75 UJ									
MW-28-25	04/21/2004	MW-28-023	N							1 U			0.2 U									
MW-28-25	04/28/2004	MW-28-024	N							1 UJ			0.2 U									
MW-28-25	05/05/2004	MW-28-025	N							1 UJ			0.2 U									
MW-28-25	05/11/2004	MW-28-026	N							1 U			0.2 U									
MW-28-25	05/20/2004	MW-28-027	N							2.5			0.2 U									
MW-28-25	05/26/2004	MW-28-028	N							1 U			0.2 U									
MW-28-25	06/02/2004	MW-28-029	N							1 U			0.2 U									
MW-28-25	06/07/2004	MW-28-25-030	N							1 U		10.4 U	0.2 U				20 U					48.2 U
MW-28-25	06/16/2004	MW-28-25-031	N							1 U			0.2 U									
MW-28-25	06/23/2004	MW-28-032	N							1 U			0.2 U									
MW-28-25	06/30/2004	MW-28-033	N							1 U			0.2 U									
MW-28-25	07/07/2004	MW-28-034	N							1 U			0.2 U									
MW-28-25	07/13/2004	MW-28-25-035	N							1 U			0.2 U									
MW-28-25	07/21/2004	MW-28-036	N							1 U			0.2 U									
MW-28-25	07/27/2004	MW-28-25-037	N							1 U			0.2 U									
MW-28-25	08/04/2004	MW-28-25-038	N							1 U			0.2 U									
MW-28-25	08/11/2004	MW-28-25-039	N							1 U			0.2 U									
MW-28-25	08/19/2004	MW-28-25-040	N							1 U			0.2 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-28-25	09/20/2004	MW-28-25-043	N							1 U			0.2 U									
MW-28-25	10/19/2004	MW-28-25-045	N							1 U			0.2 U									
MW-28-25	11/15/2004	MW-28-25-047	N							1 U												
MW-28-25	12/02/2004	MW-28-25-048	N										0.2 U									
MW-28-25	12/14/2004	MW-28-25-049	N							1 U			0.2 U									
MW-28-25	01/11/2005	MW-28-25-051	N							1 U			0.2 U									
MW-28-25	02/08/2005	MW-28-25-053	N							1 U			0.2 U									
MW-28-25	03/10/2005	MW-28-025-056	N							1 U			0.2 U									
MW-28-25	04/04/2005	MW-28-025-060	N							1 U			0.2 U									
MW-28-25	05/03/2005	MW-28-025-064	N							1 U			0.2 U									
MW-28-25	06/15/2005	MW-28-025-070	N							1 U			0.2 U									
MW-28-25	07/13/2005	MW-28-025-074	N							1 U			0.2 U									
MW-28-25	10/06/2005	MW-28-025-081	N							1 U			0.2 U									
MW-28-25	12/16/2005	MW-28-025-087	N							1 U			0.2 U									
MW-28-25	03/09/2006	MW-28-025-093	N							1 U			0.2 U									
MW-28-25	05/05/2006	MW-28-025-098	N							1 U			0.2 U									
MW-28-25	10/11/2006	MW-28-025-110	N							1 U			0.2 U									
MW-28-25	10/04/2007	MW-28-025-136	N							1 U			1 U									
MW-28-90	04/29/2004	MW-28-90-024	N							2.4			1 U									
MW-28-90	06/10/2004	MW-28-90-030	N				110			1 U			1 U									
MW-28-90	08/26/2004	MW-28-90-041	N							2.1			1 U									
MW-28-90	09/09/2004	MW-28-90-042	N							1 U			1 U									
MW-28-90	09/20/2004	MW-28-90-043	N							1 U			1 U									
MW-28-90	10/06/2004	MW-28-90-044	N							1 U			1 U									
MW-28-90	10/19/2004	MW-28-90-045	N							1.1			1 U									
MW-28-90	11/02/2004	MW-28-90-046	N							1 U			1 U									
MW-28-90	11/15/2004	MW-28-90-047	N							1 U												
MW-28-90	12/02/2004	MW-28-90-048	N							1 U			1 U									
MW-28-90	12/13/2004	MW-28-90-049	N							1 U			0.2 UJ									
MW-28-90	12/29/2004	MW-28-90-050	N							1 U			1 U									
MW-28-90	01/11/2005	MW-28-90-051	N							1 U			1 U									
MW-28-90	01/27/2005	MW-28-90-052	N							5.1			1 U									
MW-28-90	02/08/2005	MW-28-90-053	N							1 U			1 U									
MW-28-90	02/22/2005	MW-28-90-054	N							1 U			1 U									
MW-28-90	03/07/2005	MW-28-90-056	N							1 U			1 U									
MW-28-90	03/22/2005	MW-28-090-058	N							1 U			1 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-28-90	04/04/2005	MW-28-090-060	N							1 U			1 U									
MW-28-90	04/20/2005	MW-28-090-062	N							1 U			1 U									
MW-28-90	05/03/2005	MW-28-090-064	N							1 U			1 U									
MW-28-90	05/19/2005	MW-28-090-066	N							1 U			1 U									
MW-28-90	06/02/2005	MW-28-90-068	N							1 U			1 U									
MW-28-90	06/15/2005	MW-28-090-070	N							1 U			1 U									
MW-28-90	07/01/2005	MW-28-090-072	N							1 U			1 U									
MW-28-90	07/13/2005	MW-28-090-074	N							1 U			1 U									
MW-28-90	08/18/2005	MW-28-090-077	N							1.1			1 U									
MW-28-90	09/09/2005	MW-28-090-079	N							1 U			1 U									
MW-28-90	10/06/2005	MW-28-090-081	N							1 U			1 U									
MW-28-90	11/02/2005	MW-28-090-083	N							1 U			1 U									
MW-28-90	12/16/2005	MW-28-090-087	N							1 U			1 U									
MW-28-90	01/10/2006	MW-28-090-089	N							1 U			1 U									
MW-28-90	02/09/2006	MW-28-090-091	N							1 U			0.2 UJ									
MW-28-90	03/06/2006	MW-28-090-093	N							1 U			1 U									
MW-28-90	04/06/2006	MW-28-090-095	N							1 U			1 U									
MW-28-90	05/05/2006	MW-28-090-098	N							1 U			1 U									
MW-28-90	06/15/2006	MW-28-090-102	N							1 U			1 U									
MW-28-90	07/13/2006	MW-28-090-104	N							1 U			1 UJ									
MW-28-90	08/11/2006	MW-28-090-106	N							1 U			0.2 U									
MW-28-90	09/08/2006	MW-28-090-108	N							1 U			0.2 U									
MW-28-90	10/13/2006	MW-28-090-110	N							1 U			0.2 U									
MW-28-90	12/14/2006	MW-28-090-115	N							1 U			1 U									
MW-28-90	03/08/2007	MW-28-090-121	N							1 U			1 U									
MW-28-90	05/04/2007	MW-28-090-125	N							1 U			0.2 U									
MW-28-90	10/04/2007	MW-28-090-136	N							1 U			1 U									
MW-28-90	05/07/2008	MW-28-090-143	N							1 U			0.2 U									
MW-29	06/15/1999	MW-29_06/15/1999	N				34			20 U	9.5 J	10 U	3.3 J		21	25 U				10 U		17
MW-29	09/14/1999	MW-29_09/14/1999	N							20 U	4.9 J	10 U				25 U						5.3
MW-29	11/30/1999	MW-29_11/30/1999	N							20 U	8.9 J	10 U				4.7 J						11
MW-29	03/23/2000	MW-29_03/23/2000	N							20 U	3.1 J	10 U				5.1						13
MW-29	06/15/2000	MW-29_06/15/2000	N							20 U	12	10 U				1.7 J						10
MW-29	09/01/2000	MW-29_09/01/2000	N				47			20 U	11	10 U	5 U		18	4 J				1.6 J		9.1 J
MW-29	12/01/2000	MW-29_12/01/2000	N							20 U	3.6 J	10 U				5						4.9 J
MW-29	03/28/2001	MW-29_03/28/2001	N							20 U	9.6 J	10 U				6.1						16

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-29	06/06/2001	MW-29_06/06/2001	N							20 U		10 U	10 U				5.1					16
MW-29	08/25/2001	MW-29_08/25/2001	N							20 U		3.9 J	10 U				3 J					55
MW-29	09/12/2001	MW-29_09/12/2001	N							20 U		3.9 J	10 U				1.5 J					46
MW-29	11/30/2001	MW-29_11/30/2001	N				300			800 U		400 U	10 U	5 U		5 U	10 J				14	76
MW-29	03/05/2002	MW-29-001_03/05/2002	N									18.7	10 U				21.3					111
MW-29	06/12/2002	MW-29-002_6/12/02	N							4.8		10 U	10 U				7.9					66.4
MW-29	08/06/2002	MW-29-RS_8/6/02	N							3.1			10 U									
MW-29	08/06/2002	MW-41-RS_8/6/02	FD							3.2			10 U									
MW-29	09/19/2002	MW-29-003	N							7.6		20 U	10 U				19.9					125
MW-29	12/11/2002	MW-29_12/11/02_LS	N							12.5		20 U	10 U				12.8 J					145
MW-29	03/20/2003	MW-29-005	N							19.3		11 U	10 U				27.8 U					356
MW-29	06/11/2003	MW-29-006	N				500 U			3.3 J		10 U	10 UJ				26.1 U					101
MW-29	09/10/2003	MW-29-007	N							1 U		11 U					26.1 U					23.2 J
MW-29	12/11/2003	MW-29-009	N							1 U		15.9					20 U					54.7
MW-29	02/19/2004	MW-29-WV-014	N							1.8 U			0.2 UJ									
MW-29	03/18/2004	MW-29-018	N							1 U		10 U	0.2 U				20 U					355
MW-29	04/13/2004	MW-29-022	N							1 U			0.2 U									
MW-29	05/11/2004	MW-29-026	N							2.9			0.2 U									
MW-29	06/09/2004	MW-29-030	N							1 U		10.4 U	0.2 U				20 U					70.3 U
MW-29	07/13/2004	MW-29-035	N							1 U			0.2 U									
MW-29	08/11/2004	MW-29-039	N							1 U			0.2 U									
MW-29	09/20/2004	MW-29-043	N							1 U			0.2 U									
MW-29	10/19/2004	MW-29-045	N							1 U			0.2 U									
MW-29	11/15/2004	MW-29-047	N							1 U												
MW-29	12/02/2004	MW-29-048	N										0.2 U									
MW-29	12/14/2004	MW-29-049	N							1 U			0.2 UJ									
MW-29	01/11/2005	MW-29-051	N							1 U			1 U									
MW-29	02/07/2005	MW-29-053	N							3			1 U									
MW-29	03/09/2005	MW-29-056	N							1 U			2 U									
MW-29	04/06/2005	MW-29-060	N							1 U			1 U									
MW-29	05/05/2005	MW-29-064	N							1 U			0.2 U									
MW-29	06/15/2005	MW-29-070	N							1 U			0.2 U									
MW-29	10/04/2005	MW-29-081	N							1 U			0.2 U									
MW-29	12/12/2005	MW-29-087	N							1 U			0.2 U									
MW-29	04/13/2006	MW-29-093	N							1 U			0.2 U									
MW-29	05/05/2006	MW-29-098	N							1 U			0.2 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-29	10/13/2006	MW-29-110	N							1 U			0.2 U									
MW-29	10/04/2007	MW-29-136	N							1 U			1 U									
MW-30-30	06/15/1999	MW-30_06/15/1999	N				370			400		200	10 U	67 J		100	500				200	110
MW-30-30	09/14/1999	MW-30_09/14/1999	N							20 U		7.9 J	10 U				25 U					8
MW-30-30	12/02/1999	MW-30-30_12/02/1999	N							20 U		6.9 J	10 U				4.7 J					31
MW-30-30	03/23/2000	MW-30_03/23/2000	N							20 U		6.7 J	10 U				1.7 J					18
MW-30-30	06/15/2000	MW-30_06/15/2000	N							20 U		9.2 J	10 U				2.6 J					10
MW-30-30	09/01/2000	MW-30_09/01/2000	N				100			20 U		3.1 J		5 U		11	17				10 U	12
MW-30-30	12/01/2000	MW-30_12/01/2000	N							20 U		5.9 J	10 U				2.8 J					10
MW-30-30	03/28/2001	MW-30_03/28/2001	N							20 U		6.9 J	10 U				25 U					9.5 J
MW-30-30	06/06/2001	MW-30_06/06/2001	N							20 U		2.3 J	10 U				4.7 J					17
MW-30-30	09/12/2001	MW-30_09/12/2001	N							20 U		4.4 J	10 U				3.2 J					18
MW-30-30	11/29/2001	MW-30_11/29/2001	N				1100			800 U		400 U	10 U	73 J		5 U	400 U				10 U	5 U
MW-30-30	03/05/2002	MW-30-001_03/05/2002	N									24	10 U				37.6					72.1
MW-30-30	06/11/2002	MW-30-002_6/11/02	N							5		10 U	10 U				43.7					56.1
MW-30-30	08/06/2002	MW-30-RS_8/6/02	N							3.2			10 U									
MW-30-30	09/19/2002	MW-30-003	N							1.1 U		20 U	10 U				7.1					42
MW-30-30	12/12/2002	MW-30_12/12/02_LS	N							3.5		20 U	10 U				35					96.3
MW-30-30	03/20/2003	MW-30-005	N							26.4		11 U	10 U				23.5 J					597
MW-30-30	06/10/2003	MW-30-30-006	N				500 U			6.1		10 U	10 U				39.5					110
MW-30-30	09/10/2003	MW-30-30-007	N							1.6		11 U					40					69.6
MW-30-30	11/04/2003	MW-30-30-008	N							1 U												
MW-30-30	12/11/2003	MW-30-30-009	N							5.3		10 U					20 U					20 U
MW-30-30	01/14/2004	MW-30-30-010	N							1.7												
MW-30-30	01/29/2004	MW-30-30-011	N							1 U												
MW-30-30	02/05/2004	MW-30-30-012	N							1 U												
MW-30-30	02/12/2004	MW-30-30-013	N							1 U												
MW-30-30	02/19/2004	MW-30-30-WV-014	N	50 U						1.8 U												
MW-30-30	02/26/2004	MW-30-30-015	N							1 U			1 U									
MW-30-30	03/04/2004	MW-30-30-016	N							1 U			5 U									
MW-30-30	03/11/2004	MW-30-30-017	N							2.3 U			5 UJ									
MW-30-30	03/18/2004	MW-30-30-018	N							1 U		10 U	5 U				20 U					61.1
MW-30-30	03/24/2004	MW-30-30-019	N							1 U			5 U									
MW-30-30	03/31/2004	MW-30-30-020	N							1.4			10 U									
MW-30-30	04/07/2004	MW-30-30-021	N							1.1			5 UJ									
MW-30-30	04/14/2004	MW-30-30-022	N							1.3 U			3.8 UJ									

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Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-30-30	04/21/2004	MW-30-30-023	N							2			7.5 U									
MW-30-30	04/28/2004	MW-30-30-024	N							1.1			5 U									
MW-30-30	05/05/2004	MW-30-30-025	N							1 U			5 U									
MW-30-30	05/12/2004	MW-30-30-026	N							1 U			5 U									
MW-30-30	05/20/2004	MW-30-30-027	N							1.9			5 U									
MW-30-30	05/26/2004	MW-30-30-028	N							2.4			5 U									
MW-30-30	06/03/2004	MW-30-30-029	N							1.4			5 U									
MW-30-30	06/09/2004	MW-30-30-030	N							1 U		10.4 U	5 U				20 U					42.8 U
MW-30-30	06/16/2004	MW-30-30-031	N							1 U			5 U									
MW-30-30	06/24/2004	MW-30-30-032	N							1 U			5 U									
MW-30-30	07/01/2004	MW-30-30-033	N							1 U			5 U									
MW-30-30	07/08/2004	MW-30-30-034	N							1.7			5 U									
MW-30-30	07/14/2004	MW-30-30-035	N							1 U			5 U									
MW-30-30	07/22/2004	MW-30-30-036	N							1 U			5 U									
MW-30-30	07/28/2004	MW-30-30-037	N							1 U			5 U									
MW-30-30	08/04/2004	MW-30-30-038	N							1 U			5 U									
MW-30-30	08/12/2004	MW-30-30-039	N							1 U			5 U									
MW-30-30	08/19/2004	MW-30-30-040	N							1 U			5 U									
MW-30-30	09/23/2004	MW-30-30-043	N							1 U			5 U									
MW-30-30	10/20/2004	MW-30-30-045	N							1 U			5 U									
MW-30-30	11/16/2004	MW-30-30-047	N							1 U			5 U									
MW-30-30	12/15/2004	MW-30-30-049	N							1 U			5 U									
MW-30-30	01/11/2005	MW-30-30-051	N							1 U			5 U									
MW-30-30	02/09/2005	MW-30-30-053	N							1 U			5 U									
MW-30-30	03/10/2005	MW-30-030-056	N							1 U			5 U									
MW-30-30	04/06/2005	MW-30-30-060	N							1 U			2 U									
MW-30-30	05/09/2005	MW-30-030-064	N							1 U			2 U									
MW-30-30	10/07/2005	MW-30-030-081	N							1 U			0.2 U									
MW-30-30	12/15/2005	MW-30-030-087	N							1 U			5 U									
MW-30-30	03/13/2006	MW-30-030-093	N							1 U			5 U									
MW-30-30	05/02/2006	MW-30-030-098	N							1 U			2 U									
MW-30-30	10/10/2006	MW-30-030-110	N							1 U			2 U									
MW-30-30	10/08/2007	MW-30-030-136	N	20 U	40 U		83	12 U	12 U	1 U	12 U	20 U	1 U	20 U	0.2 U	20 U	20 U	40 U	12 U	60 U	12 U	40 U
MW-30-50	03/19/2003	MW-30-50-005A	N							3140		11 U	3400				27.8 U					91.7
MW-30-50	03/20/2003	MW-30-50-005B	FD							3340			3760									
MW-30-50	06/10/2003	MW-30-50-006	N				500 U			2600		10 U	2710				26.1 U					73.6 J

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-30-50	06/10/2003	MW-43-006	FD				500 U			2720		10 U	2770				26.1 U					146 J
MW-30-50	09/10/2003	MW-30-50-007	N							175		39.2	90.6				26.1 U					365
MW-30-50	11/04/2003	MW-30-50-008	N							1 U												
MW-30-50	11/04/2003	MW-90-008	FD							1 U												
MW-30-50	12/12/2003	MW-30-50-009	N							8.1 J		10 U					20 U					46.7 J
MW-30-50	12/12/2003	MW-93-009	FD							4.9 J		10 U					20 U					20 UJ
MW-30-50	01/14/2004	MW-30-50-010	N							3.7			0.2 U									
MW-30-50	01/29/2004	MW-30-50-011	N							2.8												
MW-30-50	02/05/2004	MW-30-50-012	N							1 U												
MW-30-50	02/12/2004	MW-30-50-013	N							1 U												
MW-30-50	02/19/2004	MW-30-50-WV-014	N							333			384									
MW-30-50	02/26/2004	MW-30-50-015	N							1 U			1 UJ									
MW-30-50	03/05/2004	MW-30-50-016	N							41.2			83.1									
MW-30-50	03/05/2004	MW-91-016	FD							60.6			104									
MW-30-50	03/11/2004	MW-30-50-017	N							744			984									
MW-30-50	03/18/2004	MW-30-50-018	N							1410		10 U	1650				20 U					98.5 J
MW-30-50	03/18/2004	MW-93-018	FD							1300		10 U	1520				20 U					54.6 J
MW-30-50	03/25/2004	MW-30-50-019	N							2240			2310									
MW-30-50	04/01/2004	MW-30-50-020	N							1820			2080									
MW-30-50	04/08/2004	MW-30-50-021	N							1700			1740									
MW-30-50	04/08/2004	MW-90-021	FD							1680			1750									
MW-30-50	04/15/2004	MW-30-50-022	N							2130			1980									
MW-30-50	04/15/2004	MW-91-022	FD							2050			1920									
MW-30-50	04/22/2004	MW-30-50-023	N							1870			1950 J									
MW-30-50	04/29/2004	MW-30-50-024	N							1930			1810									
MW-30-50	05/06/2004	MW-30-50-025	N							2080			1970									
MW-30-50	05/14/2004	MW-30-50-026	N							1730			2010									
MW-30-50	05/14/2004	MW-91-026	FD							1650			1870									
MW-30-50	05/20/2004	MW-30-50-027	N							1860			1720									
MW-30-50	05/27/2004	MW-30-50-028	N							1530			1650									
MW-30-50	06/03/2004	MW-30-50-029	N							2070			1960									
MW-30-50	06/09/2004	MW-30-50-030	N							1640		10.4 U	1710				20 U					67 U
MW-30-50	06/09/2004	MW-93-030	FD							1640		10.4 U	1690				20 U					62.6 U
MW-30-50	06/16/2004	MW-30-50-031	N							1700			1550									
MW-30-50	06/24/2004	MW-30-50-032	N							1730			1440									
MW-30-50	07/01/2004	MW-30-50-033	N							1420			1590									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-30-50	07/08/2004	MW-30-50-034	N							1740												
MW-30-50	07/15/2004	MW-30-50-035	N							1140			1170									
MW-30-50	07/15/2004	MW-90-035	FD							1160			1190									
MW-30-50	07/22/2004	MW-30-50-036	N							1430			1290									
MW-30-50	07/28/2004	MW-30-50-037	N							1100			1150									
MW-30-50	08/05/2004	MW-30-50-038	N							809			883									
MW-30-50	08/05/2004	MW-90-038	FD							781			893									
MW-30-50	08/12/2004	MW-30-50-039	N							689			756									
MW-30-50	08/12/2004	MW-90-039	FD							790			752									
MW-30-50	08/20/2004	MW-30-50-040	N							970			729									
MW-30-50	09/23/2004	MW-30-50-043	N							739			831									
MW-30-50	09/23/2004	MW-90-043	FD							754			774									
MW-30-50	10/21/2004	MW-30-50-045	N							464			487									
MW-30-50	11/17/2004	MW-30-50-047	N							257			243									
MW-30-50	12/15/2004	MW-30-50-049	N							33.9			29.4									
MW-30-50	12/15/2004	MW-92-049	FD							36.5			26.2									
MW-30-50	01/11/2005	MW-30-50-051	N							1 U			10 U									
MW-30-50	01/11/2005	MW-91-051	FD							1 U			1 U									
MW-30-50	02/09/2005	MW-30-50-053	N							1.6 J			10 U									
MW-30-50	02/09/2005	MW-91-053	FD							11.2 J			1 U									
MW-30-50	03/10/2005	MW-30-050-056	N							1 U			1 U									
MW-30-50	04/06/2005	MW-30-50-060	N							15.5			18.5									
MW-30-50	04/06/2005	MW-91-060	FD							13			17.1 J									
MW-30-50	05/09/2005	MW-30-050-064	N							1 U			1 U									
MW-30-50	05/09/2005	MW-91-064	FD							1 U			1 U									
MW-30-50	10/07/2005	MW-30-050-081	N							1 U			1 U									
MW-30-50	12/16/2005	MW-30-050-087	N							1 U			1 U									
MW-30-50	03/09/2006	MW-30-050-093	N							1 U			1 U									
MW-30-50	05/02/2006	MW-30-050-098	N							1 U			1 U									
MW-30-50	10/11/2006	MW-30-050-110	N							1 U			0.2 U									
MW-30-50	10/11/2006	MW-92-110	FD							1 U			0.2 U									
MW-31-60	06/15/1999	MW-31_06/15/1999	N				54			4000	50		3020	21 J		25	130				50		27
MW-31-60	09/14/1999	MW-31_09/14/1999	N							3500	10 U		3360				25 U						9.9
MW-31-60	12/02/1999	MW-31_12/02/1999	N							3900	10		3690				1.8 J						30
MW-31-60	03/25/2000	MW-31_03/25/2000	N							3800	4.4 J		3880				1.7 J						36
MW-31-60	06/14/2000	MW-31_06/14/2000	N							3400	23		3670				2.4 J						73

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-31-60	09/01/2000	MW-31_09/01/2000	N				48			3800		5.7 J	3930	5 U		6.5	2 J				9.6 J	7.3 J
MW-31-60	12/01/2000	MW-31_12/01/2000	N							3800		3.7 J	3850				2 J					31
MW-31-60	03/28/2001	MW31_03/28/2001	N							3700		10 U	4010				1.8 J					14
MW-31-60	06/06/2001	MW31_06/06/2001	N							3500		10 U	3650				5.3					48
MW-31-60	09/12/2001	MW-31_09/12/2001	N							3500		10 U	3900				2.2 J					14
MW-31-60	11/29/2001	MW-31_11/29/2001	N				40			3700		400 U	3800	5 U		6.3	2.3 J				5.8 J	34
MW-31-60	03/07/2002	MW-31-001_03/07/2002	N									40.8 J	4520				9.3					46.1 J
MW-31-60	03/07/2002	MW-52-001_03/07/2002	FD									7.5 J	4460				9.8 J					110 J
MW-31-60	06/13/2002	MW-31-002_6/13/02	N							4000		10 U	3730				6.4					36
MW-31-60	09/17/2002	MW-31-003	N							5060		27.8 U	3640				5.6 U					262
MW-31-60	12/11/2002	MW-31_12/11/02_LS	N							5620		20 U	3880				27.8 U					274
MW-31-60	03/21/2003	MW-31-005	N							3450		11 U	4000				27.8 U					211
MW-31-60	06/11/2003	MW-31-006	N				500 U			3160		10 U	3570				26.1 U					149
MW-31-60	09/09/2003	MW-31-007	N							3460		11 U	3550				26.1 U					24.8 J
MW-31-60	12/10/2003	MW-31-009	N							5010		10 U	3660				20 U					21
MW-31-60	03/03/2004	MW-31-016	N							3370			3970									
MW-31-60	03/16/2004	MW-31-018	N							3230		10 U	4450				20 U					178
MW-31-60	05/14/2004	MW-31-60-026	N							3800			3610									
MW-31-60	06/08/2004	MW-31-60-030	N							3300		10.4 U	3510				20 U					63.5 U
MW-31-60	09/22/2004	MW-31-060-043	N							3070			3090									
MW-31-60	11/16/2004	MW-31-60-047	N							3250			2920									
MW-31-60	12/16/2004	MW-31-060-049	N							2680			2910									
MW-31-60	03/09/2005	MW-31-60-056	N	52 U	5 U	10 U	35.7	3.1 U	3.1 U	2590	3.1 U	5 U	2700	2.1 U	0.2 U	9.8	5 U	10 U	3.1 U	15 U	118	104
MW-31-60	03/09/2005	MW-31-60-056	N							2550												
MW-31-60	04/07/2005	MW-31-060-060	N							2030			1910									
MW-31-60	06/13/2005	MW-31-060-070	N							1810			1790									
MW-31-60	10/06/2005	MW-31-060-081	N		2 U	1.96	300 U	1 U	1 U	1470	1 U	10.4 U	1430	1 U	0.2 U	14.5	20 U	2.94	1 U	1 U	5 U	20 U
MW-31-60	12/13/2005	MW-31-060-087	N							1250			1300									
MW-31-60	03/15/2006	MW-31-060-093	N							1010			1020									
MW-31-60	03/15/2006	MW-93-093	FD							1010			1000									
MW-31-60	05/01/2006	MW-31-060-098	N							959			952									
MW-31-60	10/05/2006	MW-31-060-110	N							849			773									
MW-31-60	03/12/2007	MW-31-060-121	N							638			626		0.2 U							
MW-31-60	10/04/2007	MW-31-060-136	N							669			726 J									
MW-31-135	04/16/2004	MW-31D-022	N							378			331									
MW-31-135	04/16/2004	MW-92-022	FD							396			354									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-31-135	06/10/2004	MW-31-135-030	N				67			261			266									
MW-31-135	09/23/2004	MW-31-135-043	N							246			282									
MW-31-135	12/14/2004	MW-31-135-049	N							407			410 J									
MW-31-135	03/10/2005	MW-31-135-056	N							403			422									
MW-31-135	06/13/2005	MW-31-135-070	N							344			318									
MW-31-135	06/13/2005	MW-94-070	FD							338			318									
MW-31-135	10/06/2005	MW-31-135-081	N							251			271									
MW-31-135	12/14/2005	MW-31-135-087	N							198			221									
MW-31-135	03/15/2006	MW-31-135-093	N							186			173									
MW-31-135	05/09/2006	MW-31-135-098	N							146			154									
MW-31-135	10/05/2006	MW-31-135-110	N							81.7			85.7									
MW-31-135	03/08/2007	MW-31-135-121	N							55.2			51									
MW-31-135	03/08/2007	MW-92-121	FD							54.2			52									
MW-31-135	05/01/2007	CIS-012	N			4.64	37.5			47.4		1 U	46.1	1 U		30.9	1 U	1 U			10.8	10 U
MW-31-135	10/01/2007	MW-31-135-136	N							29.4			33.2									
MW-32-20	03/19/2003	MW-32-20-005A	N							13		11 U	10 U				27.8 U					65.9
MW-32-20	03/20/2003	MW-32-20-005B	FD							11.5			10 UJ									
MW-32-20	06/10/2003	MW-32-20-006	N				5140			3.1 J		10.2	10 U				26.1 U					85.7
MW-32-20	09/10/2003	MW-32-20-007	N							1 U		11 U					26.1 U					35.9
MW-32-20	11/04/2003	MW-32-20-008	N							1 U												
MW-32-20	12/11/2003	MW-32/20-009	N							5.8		10 U					20 U					80.6
MW-32-20	01/13/2004	MW-32-20-010	N							1 U												
MW-32-20	02/18/2004	MW-32-20-WV-014	N	50 U						1 U			1 U									
MW-32-20	03/04/2004	MW-32-20-016	N							1.9 U			1 U									
MW-32-20	03/18/2004	MW-32-20-018	N							1 U		10 U	0.2 UJ				20 U					84.4
MW-32-20	04/13/2004	MW-32-20-022	N							1 U			0.75 UJ									
MW-32-20	05/12/2004	MW-32-20-026	N							1 U			1 U									
MW-32-20	06/07/2004	MW-32-20-030	N							1 U		10.4 U	1 U				20 U					52 U
MW-32-20	07/13/2004	MW-32-20-035	N							1 U			1 U									
MW-32-20	08/11/2004	MW-32-20-039	N							1 U			2 U									
MW-32-20	09/20/2004	MW-32-20-043	N							1 U			2 U									
MW-32-20	10/19/2004	MW-32-20-045	N							1 U			1 U									
MW-32-20	11/15/2004	MW-32-20-047	N							1 U												
MW-32-20	12/02/2004	MW-32-20-048	N										1 U									
MW-32-20	12/14/2004	MW-32-20-049	N							1 U			1 UJ									
MW-32-20	01/10/2005	MW-32-20-051	N							1 U			1 U									

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Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-32-20	02/07/2005	MW-32-20-053	N							1 U			1 U									
MW-32-20	03/09/2005	MW-32-020-056	N							1 U			2 U									
MW-32-20	04/04/2005	MW-32-020-060	N							1 U			1 U									
MW-32-20	05/09/2005	MW-32-020-064	N							1 U			1 U									
MW-32-20	06/17/2005	MW-32-020-070	N							1 U			1 U									
MW-32-20	10/04/2005	MW-32-020-081	N							1 UJ			2 U									
MW-32-20	12/16/2005	MW-32-020-087	N							1 U			2 U									
MW-32-20	03/10/2006	MW-32-020-093	N							1 U			2 U									
MW-32-20	05/04/2006	MW-32-020-098	N							1 U			1 U									
MW-32-20	10/02/2006	MW-32-020-110	N							1 U			5 U									
MW-32-20	12/11/2006	MW-32-020-115	N							1 U			2 U									
MW-32-20	03/06/2007	MW-32-020-121	N							1 U			2 U									
MW-32-20	04/30/2007	MW-32-020-125	N							1 U			2 U									
MW-32-20	10/01/2007	MW-32-020-136	N							1 U			2 U									
MW-32-35	03/19/2003	MW-32-35-005A	N							13.5	11 U		10 U			27.8 U						297
MW-32-35	03/20/2003	MW-32-35-005B	FD							13.1			10 U									
MW-32-35	06/10/2003	MW-32-35-006	N				500 U			3.8 J	10 U		10 U			26.1 U						329
MW-32-35	09/10/2003	MW-32-35-007	N							1 U	11 U					26.1 U						39.8
MW-32-35	11/04/2003	MW-32-35-008	N							1 U												
MW-32-35	12/11/2003	MW-32/35-009	N							2	10 U					20 U						381
MW-32-35	01/13/2004	MW-32-35-010	N							13.3												
MW-32-35	02/18/2004	MW-32-35-WV-014	N	50 U						1 U												
MW-32-35	03/04/2004	MW-32-35-016	N							1.5 U			1 U									
MW-32-35	03/18/2004	MW-32-35-018	N							1 U	10 U		0.2 U			20 U						70.4
MW-32-35	04/13/2004	MW-32-35-022	N							1.7			0.75 UJ									
MW-32-35	05/12/2004	MW-32-35-026	N							1 U			1 U									
MW-32-35	06/08/2004	MW-32-35-030	N							1 U	10.4 U		1 U			20 U						26.3 U
MW-32-35	07/14/2004	MW-32-35-035	N							1 U			1 U									
MW-32-35	08/11/2004	MW-32-35-039	N							1 U			1 U									
MW-32-35	09/21/2004	MW-32-35-043	N							1 U			1 U									
MW-32-35	10/19/2004	MW-32-35-045	N							1 U			1 U									
MW-32-35	11/15/2004	MW-32-35-047	N							1 U												
MW-32-35	12/02/2004	MW-32-35-048	N										1 U									
MW-32-35	12/15/2004	MW-32-35-049	N							1 U			1 U									
MW-32-35	01/10/2005	MW-32-35-051	N							1 U			1 U									
MW-32-35	02/07/2005	MW-32-35-053	N							1 U			1 U									

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Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-32-35	03/09/2005	MW-32-035-056	N							1 U			1 U									
MW-32-35	04/04/2005	MW-32-035-060	N							1 U			1 U									
MW-32-35	05/09/2005	MW-32-035-064	N							1 U			1 U									
MW-32-35	06/17/2005	MW-32-035-070	N							1 U			1 U									
MW-32-35	10/04/2005	MW-32-035-081	N							1 U			1 U									
MW-32-35	12/16/2005	MW-32-035-087	N							1 U			1 U									
MW-32-35	03/10/2006	MW-32-035-093	N							1 U			2 U									
MW-32-35	05/04/2006	MW-32-035-098	N							1 U			1 U									
MW-32-35	10/02/2006	MW-32-035-110	N							1 U			1 U									
MW-32-35	12/11/2006	MW-32-035-115	N							1 U			1 U									
MW-32-35	03/06/2007	MW-32-035-121	N							1 U			1 U									
MW-32-35	04/30/2007	MW-32-035-125	N							1 U			1 U									
MW-32-35	10/01/2007	MW-32-035-136	N							1.2			1 U									
MW-32-35	12/10/2007	MW-32-035-138	N		3 U	19.3	300 U	1 U	2 U	2 U	5 U	10 U		2 U	0.2 U	17.2	20 U	5 U	50 U	2 U	5 U	200 U
MW-32-35	03/10/2008	MW-32-035-141	N		3 U	23.1	300 U	1 U	2 U	1 U	5 U	10 U		2 U	0.2 U	13.8	20 U	5 U	5 U	1 U	5 U	20 U
MW-32-35	05/06/2008	MW-32-035-143	N		5 U	31.6 U	500 U	1 U	2 U	1.9	5 U	10 U		5 U	0.2 U	19	20 U	7.1	5 U	2 U	5 U	20 U
MW-33-40	03/19/2003	MW-33-40-005A	N							15.5		11 U	10 U				27.8 U					89.5
MW-33-40	03/20/2003	MW-33-40-005B	FD							14.7			10 U									
MW-33-40	06/11/2003	MW-33-40-006	N				500 U			3.4 J		10 U	10 UJ				26.1 U					171
MW-33-40	09/10/2003	MW-33-40-007	N							1 U		18.9					26.1 U					26.1 U
MW-33-40	11/04/2003	MW-33-40-008	N							1 U												
MW-33-40	12/11/2003	MW-33-40-009	N							3.5		10 U					20 U					33.1
MW-33-40	01/13/2004	MW-33-40-010	N							2.2												
MW-33-40	02/19/2004	MW-33-40-WV-014	N	50 U						1.8 U												
MW-33-40	03/18/2004	MW-33-40-018	N							1 U		10 U	0.2 U				20 U					40.2
MW-33-40	04/14/2004	MW-33-40-022	N							4.9 U			0.75 UJ									
MW-33-40	05/12/2004	MW-33-40-026	N							1 U			1 U									
MW-33-40	06/09/2004	MW-33-40-030	N				21			1 U		10.4 U	1 U				20 U					52.7 U
MW-33-40	07/13/2004	MW-33-40-035	N							1 U			0.2 U									
MW-33-40	08/11/2004	MW-33-40-039	N							1 U			1 U									
MW-33-40	09/21/2004	MW-33-40-043	N							1 U			1 U									
MW-33-40	10/20/2004	MW-33-40-045	N							1 U			1 U									
MW-33-40	11/16/2004	MW-33-40-047	N							1 U			1 U									
MW-33-40	12/15/2004	MW-33-40-049	N							1 U			0.2 UJ									
MW-33-40	01/11/2005	MW-33-40-051	N							1 U			1 U									
MW-33-40	02/07/2005	MW-33-40-053	N							1 U			1 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-33-40	03/09/2005	MW-33-040-056	N							1 U			1 U									
MW-33-40	04/04/2005	MW-33-040-060	N							1 U			0.2 U									
MW-33-40	05/05/2005	MW-33-040-064	N							1 U			0.2 U									
MW-33-40	06/17/2005	MW-33-040-070	N							1 U			0.2 U									
MW-33-40	10/07/2005	MW-33-040-081	N							1 U			0.68									
MW-33-40	12/12/2005	MW-33-040-087	N							1.7			1 U									
MW-33-40	03/09/2006	MW-33-040-093	N							1 U			0.2 U									
MW-33-40	05/04/2006	MW-33-040-098	N							1 U			0.2 U									
MW-33-40	10/06/2006	MW-33-040-110	N							1 U			0.2 U									
MW-33-40	12/14/2006	MW-33-040-115	N							1.2			0.2 U									
MW-33-40	03/06/2007	MW-33-040-121	N							1 U			0.2 U									
MW-33-40	05/02/2007	MW-33-040-125	N							1 U			0.2 U									
MW-33-40	10/05/2007	MW-33-040-136	N							1.1			0.2 U									
MW-33-40	05/05/2008	MW-33-040-143	N							1 U			0.2 U									
MW-33-90	03/19/2003	MW-33-90-005A	N							16.5	11 U		10 U			27.8 U						150
MW-33-90	03/20/2003	MW-33-90-005B	FD							15.4			10 U									
MW-33-90	06/11/2003	MW-33-90-006	N				500 U			3.3 J	306		10 UJ			26.1 U						315
MW-33-90	09/12/2003	MW-33-90-007	N							1.7 J	11 U		0.2 U			26.1 U						112
MW-33-90	11/04/2003	MW-33-90-008	N							1 U												
MW-33-90	01/13/2004	MW-33-90-010	N							1 U												
MW-33-90	02/17/2004	MW-33-90-WV-014	N	50 U						11.8			13.9									
MW-33-90	02/17/2004	MW-90-WV-014	FD							11.2			13.5									
MW-33-90	03/18/2004	MW-33-90-018	N							11.4	10 U		15.5			20 U						76.9
MW-33-90	04/14/2004	MW-33-90-022	N							12			12.1									
MW-33-90	05/06/2004	MW-33-90-025	N							12.3			15.8 J									
MW-33-90	05/06/2004	MW-90-025	FD							12.6			15.7 J									
MW-33-90	05/13/2004	MW-33-90-026	N							13.5			16.1									
MW-33-90	05/13/2004	MW-90-026	FD							12.5			15.2									
MW-33-90	05/20/2004	MW-33-90-027	N							14.4			14.5									
MW-33-90	05/20/2004	MW-90-027	FD							16.4			14.6									
MW-33-90	05/26/2004	MW-33-90-028	N							14.8			14.2									
MW-33-90	05/26/2004	MW-90-028	FD							13.9			13.4									
MW-33-90	06/03/2004	MW-33-90-029	N							17.2			15									
MW-33-90	06/03/2004	MW-90-029	FD							16.8			15.4									
MW-33-90	06/10/2004	MW-33-90-030	N				69			16.7	10.4 U		14.1			20 U						42.2 U
MW-33-90	06/16/2004	MW-33-90-031	N							12.8			14									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-33-90	06/24/2004	MW-33-90-032	N							13.2			13									
MW-33-90	06/24/2004	MW-90-032	FD							16			12.8									
MW-33-90	07/01/2004	MW-33-90-033	N							16.1			14.6									
MW-33-90	07/08/2004	MW-33-90-034	N							14.4			14.2									
MW-33-90	07/08/2004	MW-90-034	FD							16.4			13.8									
MW-33-90	07/14/2004	MW-33-90-035	N							12.6			14.6									
MW-33-90	07/22/2004	MW-33-90-036	N							12.3			13.7									
MW-33-90	07/28/2004	MW-33-90-037	N							12.7			13.8									
MW-33-90	07/28/2004	MW-90-037	FD							12.1			14									
MW-33-90	08/05/2004	MW-33-90-038	N							14.1			14.3									
MW-33-90	08/12/2004	MW-33-90-039	N							12.8			14.8									
MW-33-90	08/20/2004	MW-33-90-040	N							14.8			14.6									
MW-33-90	08/20/2004	MW-90-040	FD							13.5			14.4									
MW-33-90	08/26/2004	MW-33-90-041	N							12.3			14.9									
MW-33-90	09/08/2004	MW-33-90-042	N							12			13.5									
MW-33-90	09/21/2004	MW-33-90-043	N							14			14									
MW-33-90	10/06/2004	MW-33-90-044	N							13.7			12									
MW-33-90	10/20/2004	MW-33-90-045	N							14.1			15.6									
MW-33-90	11/02/2004	MW-33-90-046	N							18.2			17.6									
MW-33-90	11/02/2004	MW-90-046	FD							16.8			17.4									
MW-33-90	11/16/2004	MW-33-90-047	N							12.7			14.8									
MW-33-90	12/02/2004	MW-33-90-048	N							13.1			15.6									
MW-33-90	12/14/2004	MW-33-90-049	N							14.8			16									
MW-33-90	12/29/2004	MW-33-90-050	N							13.7			16.7									
MW-33-90	01/11/2005	MW-33-90-051	N							14.8			18.2									
MW-33-90	01/27/2005	MW-33-90-052	N							14.4			17.7									
MW-33-90	02/07/2005	MW-33-90-053	N							14.9			20.2									
MW-33-90	02/22/2005	MW-33-90-054	N							18.3			19									
MW-33-90	03/09/2005	MW-33-090-056	N							18.2			18.6									
MW-33-90	03/22/2005	MW-33-090-058	N							19.2			18.9									
MW-33-90	04/04/2005	MW-33-090-060	N							17.2			21.3									
MW-33-90	04/19/2005	MW-33-90-062	N							17.9			20.3									
MW-33-90	04/19/2005	MW-90-062	FD							18.2			20									
MW-33-90	05/05/2005	MW-33-090-064	N							16.8			17.4									
MW-33-90	05/18/2005	MW-33-090-066	N							16.3			15.5									
MW-33-90	06/01/2005	MW-33-090-068	N							14			17.8									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-33-90	06/01/2005	MW-90-068	FD							12.7			16									
MW-33-90	06/16/2005	MW-33-090-070	N							14.2			15									
MW-33-90	06/16/2005	MW-95-070	FD							13.4			15.7 J									
MW-33-90	07/20/2005	MW-33-090-074	N							17.3			16.1									
MW-33-90	07/20/2005	MW-90-074	FD							17.3			16.5									
MW-33-90	10/06/2005	MW-33-090-081	N							13			15.5									
MW-33-90	12/13/2005	MW-33-090-087	N							21.8 J			16.4									
MW-33-90	12/13/2005	MW-96-087	FD							14 J			16.5									
MW-33-90	03/08/2006	MW-33-090-093	N							14.3			16.7									
MW-33-90	05/03/2006	MW-33-090-098	N							16.4			16.1									
MW-33-90	05/03/2006	MW-33-090-CIS	N	50 U	2 U	1.89	66.2	1 U	1 U	17.8	1 U	1 U		1 U	0.2 U	36.9	2.33	1.06	1 U	1 U	5.25	17
MW-33-90	05/03/2006	MW-96-098	FD							15.3			19.3									
MW-33-90	10/06/2006	MW-33-090-110	N							20.9			17.3									
MW-33-90	12/15/2006	MW-33-090-115	N							13.8			17.8 J									
MW-33-90	12/15/2006	MW-94-115	FD							13.5												
MW-33-90	03/12/2007	MW-33-090-121	N							18			17.1									
MW-33-90	05/02/2007	MW-33-090-125	N							16.8			18.8									
MW-33-90	10/05/2007	MW-33-090-136	N							19.4			18.2									
MW-33-90	05/05/2008	MW-33-090-143	N							20.2			21.1									
MW-33-150	03/02/2005	MW-33-150-055	N							1 U			1 U									
MW-33-150	03/02/2005	MW-91-055	FD							1 U			1 U									
MW-33-150	03/16/2005	MW-33-150-057	N				500 U			1 U			1 U									
MW-33-150	06/17/2005	MW-33-150-070	N							6.4			3.1 J									
MW-33-150	07/20/2005	MW-33-150-074	N							5.6			5.2									
MW-33-150	08/17/2005	MW-33-150-077	N							6.1			4									
MW-33-150	09/09/2005	MW-33-150-079	N							2.8			3.9									
MW-33-150	10/06/2005	MW-33-150-081	N							3.9			4.5									
MW-33-150	10/06/2005	MW-96-081	FD							4.9			5.3									
MW-33-150	11/02/2005	MW-33-150-083	N							4.7			5.5									
MW-33-150	12/12/2005	MW-33-150-087	N							5.7			6.6									
MW-33-150	01/10/2006	MW-33-150-089	N							5			6.4									
MW-33-150	02/07/2006	MW-33-150-091	N							6.4			4.3 J									
MW-33-150	03/08/2006	MW-33-150-093	N							3.2			4.2									
MW-33-150	04/06/2006	MW-33-150-095	N							3			4.5									
MW-33-150	05/03/2006	MW-33-150-098	N							5.5			6.6									
MW-33-150	06/16/2006	MW-33-150-102	N							5.4			5.5									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-33-150	07/13/2006	MW-33-150-104	N							6.7			7.4 J									
MW-33-150	08/11/2006	MW-33-150-106	N							8.1			9.3									
MW-33-150	09/08/2006	MW-33-150-108	N							4.1			7.4									
MW-33-150	10/06/2006	MW-33-150-110	N							5.7			7.7									
MW-33-150	12/13/2006	MW-33-150-115	N							9.8			10.8									
MW-33-150	03/06/2007	MW-33-150-121	N							7			6.9									
MW-33-150	05/02/2007	MW-33-150-125	N							6.1			6.8									
MW-33-150	10/09/2007	MW-33-150-136	N							8.3			8.9									
MW-33-150	10/09/2007	MW-96-136	FD							7.9			9.4									
MW-33-150	05/06/2008	MW-33-150-143	N							9.21			8.83									
MW-33-210	02/24/2005	MW-33-210-054	N				500 U			2.1 UJ			1 U									
MW-33-210	03/16/2005	MW-33-210-057	N				500 U			1 U			1.4									
MW-33-210	06/16/2005	MW-33-210-070	N							1.7 J			5.1 J									
MW-33-210	07/20/2005	MW-33-210-074	N							6.7			5.6									
MW-33-210	08/17/2005	MW-33-210-077	N							8			2.5									
MW-33-210	09/06/2005	MW-33-210-079	N							2.9			3.5									
MW-33-210	10/06/2005	MW-33-210-081	N							4.2			4									
MW-33-210	11/02/2005	MW-33-210-083	N							5.4			6.5									
MW-33-210	12/12/2005	MW-33-210-087	N							5.6			6.9									
MW-33-210	01/10/2006	MW-33-210-089	N							5.2			7.6									
MW-33-210	02/07/2006	MW-33-210-091	N							7.2			9									
MW-33-210	03/06/2006	MW-33-210-093	N							6.5			10.7									
MW-33-210	04/13/2006	MW-33-210-095	N							1 U			4.2									
MW-33-210	05/05/2006	MW-33-210-098	N							8.8			10									
MW-33-210	05/05/2006	MW-33-210-CIS	N	50 U	2 U	2.03	52.5	1 U	1 U	11.5	1.26	1 U		1 U	0.2 U	15.1	1 U	1 U	1 U	1 U	1.79	10 UJ
MW-33-210	06/16/2006	MW-33-210-102	N							8.3			9.2									
MW-33-210	07/13/2006	MW-33-210-104	N							7.5			10 J									
MW-33-210	08/08/2006	MW-33-210-106	N							8.7			9.8									
MW-33-210	09/08/2006	MW-33-210-108	N							4.9			9.2									
MW-33-210	10/06/2006	MW-33-210-110	N							10			10.2									
MW-33-210	12/11/2006	MW-33-210-115	N							8			11.1									
MW-33-210	03/05/2007	MW-33-210-121	N							11			11.2									
MW-33-210	05/02/2007	MW-33-210-125	N							9.3			9.2									
MW-33-210	10/05/2007	MW-33-210-136	N							11.5			11.9									
MW-33-210	05/05/2008	MW-33-210-143	N							9.93			10.6									
MW-34-55	06/16/2003	MW-34-55-006-AT	N				500 U			3.8 J		10 U	10 U				22.3 J					74.4

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-34-55	06/17/2003	MW-34-55-006-BT	N							4.1 J		10 U	10 U				20.4 J					163
MW-34-55	09/10/2003	MW-34-55-007	N							1.7		11 U					26.1 U					34.9
MW-34-55	11/04/2003	MW-34-55-008	N							1 U												
MW-34-55	12/12/2003	MW-34-55-009	N							1.8		10 U					20 U					37.8
MW-34-55	01/13/2004	MW-34-55-010	N							1 U												
MW-34-55	01/29/2004	MW-34-55-011	N							1.4												
MW-34-55	02/05/2004	MW-34-55-012	N							1 U												
MW-34-55	02/12/2004	MW-34-55-013	N							1 U												
MW-34-55	02/18/2004	MW-34-55-WV-014	N	50 U						1 U												
MW-34-55	02/26/2004	MW-34-55-015	N							1 U			1 UJ									
MW-34-55	03/04/2004	MW-34-55-016	N							1.7 U			1 U									
MW-34-55	03/11/2004	MW-34-55-017	N							1.3 U			1 U									
MW-34-55	03/17/2004	MW-34-55-018	N							1 U		10 U	1 UJ				20 U					83.1 U
MW-34-55	03/24/2004	MW-34-55-019	N							6.5			2 U									
MW-34-55	03/31/2004	MW-34-55-020	N							1 U			1 UJ									
MW-34-55	04/07/2004	MW-34-55-021	N							1 U			1 U									
MW-34-55	04/15/2004	MW-34-55-022	N							1 U			1.5 UJ									
MW-34-55	04/22/2004	MW-34-55-023	N							1 U			1.5 UJ									
MW-34-55	04/29/2004	MW-34-55-024	N							1 U			2 U									
MW-34-55	04/29/2004	MW-90-024	FD							1 U			1 U									
MW-34-55	05/06/2004	MW-34-55-025	N							1 U			1 U									
MW-34-55	05/13/2004	MW-34-55-026	N							1 U			1 U									
MW-34-55	05/19/2004	MW-34-55-027	N							1.5			1 U									
MW-34-55	05/27/2004	MW-34-55-028	N							1 U			1 U									
MW-34-55	06/02/2004	MW-34-55-029	N							1 U			1 U									
MW-34-55	06/08/2004	MW-34-55-030	N	50 U	26	10 U	83	3 U	3 U	1 U	3 U	10.4 U	1 U	5 U	0.5 U	20	20 U	10 U	3 U	5 U	3 U	41.3 U
MW-34-55	06/08/2004	MW-34-55-030	N							3 U		5 U					5 U					10 U
MW-34-55	06/17/2004	MW-34-55-031	N							1 U			1 U									
MW-34-55	06/23/2004	MW-34-55-032	N							1 U			1 U									
MW-34-55	06/30/2004	MW-34-55-033	N							1 U			1 U									
MW-34-55	07/07/2004	MW-34-55-034	N							1 U			1 U									
MW-34-55	07/14/2004	MW-34-55-035	N							1 U			1 U									
MW-34-55	07/21/2004	MW-34-55-036	N							1 U			1 U									
MW-34-55	07/27/2004	MW-34-55-037	N							1 U			1 U									
MW-34-55	08/04/2004	MW-34-55-038	N							1 U			1 U									
MW-34-55	08/11/2004	MW-34-55-039	N							1 U			1 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-34-55	08/19/2004	MW-34-55-040	N							1 U			1 U									
MW-34-55	09/22/2004	MW-34-55-043	N	500 U	5 U	10 U	87.6	3 U	3 U	1 U	3 U	12	1 U	5 U	0.2 U	13	5 U	12.5	3 U	15 U	3 U	22.7
MW-34-55	10/20/2004	MW-34-55-045	N							1 U			1 U									
MW-34-55	11/16/2004	MW-34-55-047	N							1 U			1 U									
MW-34-55	12/15/2004	MW-34-55-049	N	52 U	5 U	10 U	71.8	3.1 U	3.1 U	1 U	3.1 U	6.6	0.2 UJ	12.2	0.2 U	13.7	5 U	10 U	40.4	15 U	6.5	25.1
MW-34-55	01/12/2005	MW-34-55-051	N							1 U			1 U									
MW-34-55	02/09/2005	MW-34-55-053	N							1 U			1 U									
MW-34-55	03/10/2005	MW-34-055-056	N							1 U			1 U									
MW-34-55	03/10/2005	MW-34-55-056	N	52 U	5 U	10 U	66.9	3.1 U	3.1 U	1 U	3.1 U	5 U		2.1 U	0.2 U	12.4	9.1	10 U	3.1 U	15 U	227	87.7
MW-34-55	04/05/2005	MW-34-55-060	N							1 U			1 U									
MW-34-55	05/05/2005	MW-34-055-064	N							1 U			1 U									
MW-34-55	07/15/2005	MW-34-055-074	N							1.3 U			1 U		0.2 U							
MW-34-55	10/05/2005	MW-34-055-081	N		2 U	2.01	300 U	1 U	1 U	1 U	1 U	10.4 U	1 U	1 U	0.2 U	15.7	20 U	1 U	1 U	1 U	5 U	22.7
MW-34-55	12/14/2005	MW-34-055-087	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	1 U	2 U	0.2 U	12.7	20 U	5 U	5 U	1 U	7	20 U
MW-34-55	03/08/2006	MW-34-055-093	N		2 U	2.08	59.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	16.3	4.77	1 U	1 U	1 U	1 U	10 U
MW-34-55	05/03/2006	MW-34-055-098	N		2 U	2.43	46.5	1 UJ	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	16.8	2.74	1 U	1 U	1 U	1.15	14.1
MW-34-55	10/04/2006	MW-34-055-110	N		2 U	4.83	18.6	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	25.2	1.22	1 U	1 U	1 U	2.37	10 U
MW-34-55	10/03/2007	MW-34-055-136	N							1 U			0.2 U									
MW-34-80	06/16/2003	MW-34-80-006-AT	N				500 U			8.7		10 U	10 U				26.1 U					69.2
MW-34-80	06/17/2003	MW-34-80-006-BT	N							3.2 J		10 U	10 U				22.2 J					85.4
MW-34-80	09/10/2003	MW-34-80-007	N							1 U		11 U					26.1 U					79.2
MW-34-80	11/04/2003	MW-34-80-008	N							1 U												
MW-34-80	12/11/2003	MW-34/80-009	N							45.2		10 U	37.7				20 U					34.8
MW-34-80	01/13/2004	MW-34-80-010	N							14.5 J												
MW-34-80	01/13/2004	MW-90-010	FD							9.4 J												
MW-34-80	01/29/2004	MW-34-80-011	N							111			111									
MW-34-80	01/29/2004	MW-90-011	FD							111			102									
MW-34-80	02/05/2004	MW-34-80-012	N							12.4			10.2									
MW-34-80	02/05/2004	MW-90-012	FD							15.2			12.9									
MW-34-80	02/12/2004	MW-34-80-013	N							1 U												
MW-34-80	02/12/2004	MW-90-013	FD							1 U												
MW-34-80	02/18/2004	MW-34-80-WV-014	N							16.5			20.4									
MW-34-80	02/26/2004	MW-34-80-015	N							62.5			66.2 J									
MW-34-80	02/26/2004	MW-90-015	FD							56.7			92									
MW-34-80	03/05/2004	MW-34-80-016	N							25.6			25.6									
MW-34-80	03/11/2004	MW-34-80-017	N							7.1			5									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-34-80	03/11/2004	MW-90-017	FD							7.2			7.3									
MW-34-80	03/17/2004	MW-34-80-018	N							6		10 U	5.7				20 U					75.5 U
MW-34-80	03/25/2004	MW-34-80-019	N							9.2 J			3.4 J									
MW-34-80	03/25/2004	MW-90-019	FD							4.9 J			3.7									
MW-34-80	04/01/2004	MW-34-80-020	N							3.7			2.2 J									
MW-34-80	04/08/2004	MW-34-80-021	N							2.5			2 J									
MW-34-80	04/16/2004	MW-34-80-022	N							1.6			0.86									
MW-34-80	04/22/2004	MW-34-80-023	N							1.3			0.84									
MW-34-80	04/22/2004	MW-90-023	FD							1.3			0.87									
MW-34-80	04/29/2004	MW-34-80-024	N							1 UJ			2 U									
MW-34-80	05/06/2004	MW-34-80-025	N							1.3			1 U									
MW-34-80	05/13/2004	MW-34-80-026	N							1 UJ			1 U									
MW-34-80	05/13/2004	MW-92-026	FD							1 U			1 U									
MW-34-80	05/20/2004	MW-34-80-027	N							1 UJ			1 U									
MW-34-80	05/27/2004	MW-34-80-028	N							1.2			1 U									
MW-34-80	06/02/2004	MW-34-80-029	N							1 U			2 U									
MW-34-80	06/08/2004	MW-34-80-030	N	50 U	4.2 U	10 U	51	3 U	3 U	1 U	3 U	5 U	1 U	5 U	0.5 U	20	20 U	10 U	3 U	5 U	3 U	47.8 U
MW-34-80	06/08/2004	MW-34-80-030	N		25 U					3 U		10.4 U					6					10 U
MW-34-80	06/17/2004	MW-34-80-031	N							1 U			1 U									
MW-34-80	06/17/2004	MW-92-031	FD							1 U			1 U									
MW-34-80	06/23/2004	MW-34-80-032	N							1 U			1 U									
MW-34-80	06/30/2004	MW-34-80-033	N							1 U			1 U									
MW-34-80	06/30/2004	MW-90-033	FD							1 U			2 U									
MW-34-80	07/07/2004	MW-34-80-034	N							1 U			1 U									
MW-34-80	07/15/2004	MW-34-80-035	N							1 U			1 U									
MW-34-80	07/15/2004	MW-91-035	FD							1 U			1 U									
MW-34-80	07/21/2004	MW-34-80-036	N							1 U			1 U									
MW-34-80	07/21/2004	MW-90-036	FD							1 U			1 U									
MW-34-80	07/27/2004	MW-34-80-037	N							1 U			1 U									
MW-34-80	08/05/2004	MW-34-80-038	N							1 U			1 U									
MW-34-80	08/12/2004	MW-34-80-039	N							1 U			1 U									
MW-34-80	08/12/2004	MW-91-039	FD							1 U			1 U									
MW-34-80	08/20/2004	MW-34-80-040	N							1 U			1 U									
MW-34-80	08/26/2004	MW-34-80-041	N							1.7			1 U									
MW-34-80	09/08/2004	MW-34-80-042	N							1 U			1 U									
MW-34-80	09/23/2004	MW-34-80-043	N	500 U	5 U	10 U	54.1	3 U	3 U	1 U	3 U	10.1	1 U	5 U	0.2 U	14.9	5 U	10 U	3 U	15 U	3 U	23.2

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-34-80	09/23/2004	MW-97-043	FD	500 U	5 U	10 U	52.8	3 U	3 U	1 U	3 U	10.6	1 U	5 U	0.2 U	14.4	5 U	10 U	3 U	15 U	3 U	22
MW-34-80	10/06/2004	MW-34-80-044	N							1 U			1 U									
MW-34-80	10/20/2004	MW-34-80-045	N							1 U			1 U									
MW-34-80	11/02/2004	MW-34-80-046	N							1 U			1 U									
MW-34-80	11/17/2004	MW-34-80-047	N							1 U			1 U									
MW-34-80	11/17/2004	MW-90-047	FD							1 U			1 U									
MW-34-80	12/02/2004	MW-34-80-048	N							1 U			1 U									
MW-34-80	12/13/2004	MW-34-80-049	N	52 U	5 U	10 U	42	3.1 U	3.1 U	1 U	3.1 U	5 U	1 U	2.1 U	0.2 U	14.7	8.6	10 U	3.1 U	15 U	15.3	29.7
MW-34-80	12/29/2004	MW-34-80-050	N							1 U			1 U									
MW-34-80	01/12/2005	MW-34-80-051	N							1 U			1 U									
MW-34-80	01/27/2005	MW-34-80-052	N							1 U			1 U									
MW-34-80	02/08/2005	MW-34-80-053	N							1 U			1 U									
MW-34-80	02/22/2005	MW-34-80-054	N							1 U			1 U									
MW-34-80	03/01/2005	MW-34-80-055	N							1 UJ			1 U									
MW-34-80	03/08/2005	MW-34-080-056	N	60.5	5 U	10 U	51.8	3.1 U	3.1 U	1 U	3.1 U	5 U	1 UJ	2.1 U	0.2 U	13.3	15.5	10 U	3.1 U	15 U	238	41.7
MW-34-80	03/15/2005	MW-34-080-057	N				500 U															
MW-34-80	03/15/2005	MW-34-80-057	N							1 U			1 U									
MW-34-80	03/22/2005	MW-34-080-058	N							1 U			1 U									
MW-34-80	03/29/2005	MW-34-080-059	N							1 U			1 U									
MW-34-80	04/05/2005	MW-34-80-060	N							1 U			1 U									
MW-34-80	04/12/2005	MW-34-080-061	N							1 U			1 U									
MW-34-80	04/19/2005	MW-34-080-062	N							1 U			1 U									
MW-34-80	04/26/2005	MW-34-080-063	N							1 U			1 U									
MW-34-80	05/04/2005	MW-34-080-064	N							1 U			1 U									
MW-34-80	05/18/2005	MW-34-080-066	N							1 U			1 U									
MW-34-80	06/01/2005	MW-34-080-068	N							1 U			1 U									
MW-34-80	06/30/2005	MW-34-080-070	N	50 U	2 U	2.09	46.4	1 U	1 U	1 U	1.39	2.25	1 U	1 U	0.2 U	11.1	2.23	1 U	1 U	1 U	2.74	37
MW-34-80	07/14/2005	MW-34-080-074	N							2			1 U									
MW-34-80	08/15/2005	MW-34-080-077	N							2.4			1 U									
MW-34-80	09/07/2005	MW-34-080-079	N							1 U			1 U									
MW-34-80	10/05/2005	MW-34-080-081	N		2 U	2.06	300 U	1 U	1 U	1 U	1.23	10.4 U	1 U	1 U	0.2 U	10.8	20 U	1 U	1 U	1 U	5 U	20 U
MW-34-80	11/03/2005	MW-34-080-083	N							1 U			1 U									
MW-34-80	12/14/2005	MW-34-080-087	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	1 U	2 U	0.2 U	10.2	20 U	5 U	5 U	1 U	13.5	20 U
MW-34-80	01/11/2006	MW-34-080-089	N							1 U			1 U									
MW-34-80	02/08/2006	MW-34-080-091	N							1 U			1 U									
MW-34-80	03/09/2006	MW-34-080-093	N		2 U	2.19	39.6	1 U	1 U	1 U	1.08	7.27	1 U	1 U	0.2 U	11.4	1.58	1 U	1 U	1 U	2.94	10 U

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-34-80	04/03/2006	MW-34-080-095	N							1 U			1 U									
MW-34-80	05/03/2006	MW-34-080-098	N		2 U	1.91	39.6	1 UJ	1 U	1 U	1.34	1 U	1 U	1 U	0.2 U	12.2	1.25	1 U	1 U	1 U	2.44	31
MW-34-80	06/14/2006	MW-34-080-102	N							1 U			1 U									
MW-34-80	07/12/2006	MW-34-080-104	N							1 U			1 U									
MW-34-80	08/08/2006	MW-34-080-106	N							1 U			1 U									
MW-34-80	09/06/2006	MW-34-080-108	N							1 U			1 U									
MW-34-80	10/04/2006	MW-34-080-110	N		2 U	1.68	33.3	1 U	1 U	1 U	1.22	1.1	1 U	1 U	0.2 U	13	1.66	1 U	1 U	1 U	2.34	10 U
MW-34-80	11/16/2006	MW-34-080-113	N							1 U			1 U									
MW-34-80	12/12/2006	MW-34-080-115	N		2 U	1.39	30.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	13	1	1 U	1 U	1 U	1.6	10 U
MW-34-80	01/09/2007	MW-34-080-117	N							3.2			1 U									
MW-34-80	02/05/2007	MW-34-080-119	N							1 U			1 U									
MW-34-80	03/05/2007	MW-34-080-121	N		2 U	1.3	29.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U	13.3	1.53	1 U	1 U	1 U	1.61	10 U
MW-34-80	04/02/2007	MW-34-080-123	N							1 U			0.2 U									
MW-34-80	04/30/2007	MW-34-080-125	N		2 U	1.75	31.8	10 U	1 U	1.1	1 U	1 U	1 U	1 U	0.2 U	14.9	3.47	1 U	1 U	1 U	1.67	10 U
MW-34-80	06/13/2007	MW-34-080-128	N							1 U			1 U									
MW-34-80	07/11/2007	MW-34-080-130	N							1 U			1 U									
MW-34-80	08/08/2007	MW-34-080-132	N							1 U			1 U									
MW-34-80	09/06/2007	MW-34-080-134	N							1 U			1 U									
MW-34-80	10/03/2007	MW-34-080-136	N							1 U			0.2 U									
MW-34-80	05/06/2008	MW-34-080-143	N							1 U			0.2 U									
MW-34-100	02/23/2005	MW-34-100-054	N				500 U			391			417									
MW-34-100	03/01/2005	MW-34-100-055	N							374			402									
MW-34-100	03/01/2005	MW-90-055	FD							332			411									
MW-34-100	03/08/2005	MW-34-100-056	N							490			425 J									
MW-34-100	03/14/2005	MW-34-100-057	N				500 U			474			426									
MW-34-100	03/23/2005	MW-34-100-058	N							548			421									
MW-34-100	03/29/2005	MW-34-100-059	N							110			73.9 J									
MW-34-100	03/29/2005	MW-90-059	FD							106			56.7 J									
MW-34-100	04/05/2005	MW-34-100-060	N							488			452									
MW-34-100	04/05/2005	MW-90-060	FD							454			455									
MW-34-100	04/12/2005	MW-34-100-061	N							502			482									
MW-34-100	04/12/2005	MW-90-061	FD							562			499									
MW-34-100	04/19/2005	MW-34-100-062	N							599			473									
MW-34-100	04/26/2005	MW-34-100-063	N							573			476									
MW-34-100	04/26/2005	MW-90-063	FD							602			480									
MW-34-100	05/04/2005	MW-34-100-064	N							530			491									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-34-100	05/10/2005	MW-34-100-065	N							492			513									
MW-34-100	05/10/2005	MW-90-065	FD							552			501									
MW-34-100	05/18/2005	MW-34-100-066	N							564			524									
MW-34-100	05/25/2005	MW-34-100-067	N							478			559									
MW-34-100	06/01/2005	MW-34-100-068	N							609			527									
MW-34-100	06/08/2005	MW-34-100-069	N							583			552									
MW-34-100	06/21/2005	MW-34-100-070	N							477			560		0.2 U							
MW-34-100	06/21/2005	MW-96-070	FD							480			578		0.2 U							
MW-34-100	07/07/2005	MW-34-100-072	N							639			583									
MW-34-100	07/14/2005	MW-34-100-074	N							701			617									
MW-34-100	07/27/2005	MW-34-100-075	N							504			597									
MW-34-100	08/10/2005	MW-34-100-076	N							589			574									
MW-34-100	08/10/2005	MW-90-076	FD							597			571									
MW-34-100	08/15/2005	MW-34-100-077	N							660			633									
MW-34-100	08/31/2005	MW-34-100-078	N							693			649									
MW-34-100	08/31/2005	MW-90-078	FD							604			658									
MW-34-100	09/07/2005	MW-34-100-079	N							868			673									
MW-34-100	09/20/2005	MW-34-100-080	N							891			675									
MW-34-100	10/05/2005	MW-34-100-081	N							732			732									
MW-34-100	10/05/2005	MW-93-081	FD							703			708									
MW-34-100	10/25/2005	MW-34-100-082	N							628			752									
MW-34-100	10/25/2005	MW-90-082	FD							650			752									
MW-34-100	11/03/2005	MW-34-100-083	N							897			748 J									
MW-34-100	11/16/2005	MW-34-100-085	N							762			759									
MW-34-100	11/16/2005	MW-90-085	FD							725			763									
MW-34-100	11/30/2005	MW-34-100-086	N							797			791									
MW-34-100	11/30/2005	MW-90-086	FD							721			802									
MW-34-100	12/14/2005	MW-34-100-087	N							751			808									
MW-34-100	12/14/2005	MW-93-087	FD							791			811									
MW-34-100	12/28/2005	MW-34-100-088	N							824			804									
MW-34-100	01/12/2006	MW-34-100-089	N							771			837									
MW-34-100	01/12/2006	MW-90-089	FD							764			856									
MW-34-100	01/23/2006	MW-34-100-090	N							716			822									
MW-34-100	02/08/2006	MW-34-100-091	N							706			797									
MW-34-100	02/08/2006	MW-91-091	FD							708			785									
MW-34-100	02/22/2006	MW-34-100-092	N							831			752									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-34-100	02/22/2006	MW-90-092	FD							846			748									
MW-34-100	03/08/2006	MW-34-100-093	N							857			800									
MW-34-100	03/08/2006	MW-94-093	FD							773			801									
MW-34-100	03/23/2006	MW-34-100-094	N							851			830									
MW-34-100	03/23/2006	MW-90-094	FD							855			828									
MW-34-100	04/03/2006	MW-34-100-095	N							910			858									
MW-34-100	04/21/2006	MW-34-100-096	N							873			852									
MW-34-100	05/03/2006	MW-34-100-098	N							946			900									
MW-34-100	05/03/2006	MW-34-100-CIS	N	50 U	2 U	1.85	25.7	1 U	1 U	877	1 U	1 U		1 U	0.2 U	36	1 U	1 U	1 U	1 U	2.02	14 J
MW-34-100	05/03/2006	MW-91-CIS	FD	50 U	2 U	2.01	25.9	1 U	1 U	881	1 U	1 U		1 U	0.2 U	36.7	1 U	1 U	1 U	1 U	2.15	45.7 J
MW-34-100	05/03/2006	MW-93-098	FD							946			920									
MW-34-100	05/17/2006	MW-34-100-100	N							1180			935									
MW-34-100	05/17/2006	MW-90-100	FD							1190			930									
MW-34-100	05/31/2006	MW-34-100-101	N							929			960									
MW-34-100	06/14/2006	MW-34-100-102	N							839			922									
MW-34-100	06/14/2006	MW-91-102	FD							864			921									
MW-34-100	06/28/2006	MW-34-100-103	N							1130			976									
MW-34-100	07/12/2006	MW-34-100-104	N							851			823 J									
MW-34-100	07/12/2006	MW-91-104	FD							864			828 J									
MW-34-100	07/26/2006	MW-34-100-105	N							955			859									
MW-34-100	08/08/2006	MW-34-100-106	N							982			889									
MW-34-100	08/28/2006	MW-34-100-107	N							945			922									
MW-34-100	09/06/2006	MW-34-100-108	N							963			844									
MW-34-100	09/06/2006	MW-90-108	FD							907			797									
MW-34-100	09/20/2006	MW-34-100-109	N							984			872									
MW-34-100	10/04/2006	MW-34-100-110	N							889			910									
MW-34-100	10/18/2006	MW-34-100-111	N							920			815									
MW-34-100	11/01/2006	MW-34-100-112	N							752			832									
MW-34-100	11/16/2006	MW-34-100-113	N							801			777									
MW-34-100	11/30/2006	MW-34-100-114	N							712			744									
MW-34-100	12/12/2006	MW-34-100-115	N							625 J			851									
MW-34-100	12/28/2006	MW-34-100-116	N							603			723									
MW-34-100	01/09/2007	MW-34-100-117	N							830			797									
MW-34-100	01/24/2007	MW-34-100-118	N							817			832									
MW-34-100	02/05/2007	MW-34-100-119	N							646			780									
MW-34-100	02/05/2007	MW-91-119	FD							634			764									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-34-100	02/21/2007	MW-34-100-120	N							895			804									
MW-34-100	03/07/2007	MW-34-100-121	N							788			806									
MW-34-100	03/21/2007	MW-34-100-122	N							642			724									
MW-34-100	04/02/2007	MW-34-100-123	N							786			749									
MW-34-100	04/02/2007	MW-91-123	FD							800			720									
MW-34-100	04/18/2007	MW-34-100-124	N							641			687									
MW-34-100	04/30/2007	CIS-004	N			1.53	25.3			500		1 U	626	1 U		34.7	1 U	1 U			1 U	10 U
MW-34-100	04/30/2007	CIS-096	FD			1.75	25.8			572		1 U	632	1 U		36.2	1.09	1 U			1.12	16.8
MW-34-100	05/16/2007	MW-34-100-126	N							573			588									
MW-34-100	05/30/2007	MW-34-100-127	N							656			597									
MW-34-100	06/13/2007	MW-34-100-128	N							644			609									
MW-34-100	06/13/2007	MW-91-128	FD							633			608									
MW-34-100	06/27/2007	MW-34-100-129	N							536			574									
MW-34-100	07/12/2007	MW-34-100-130	N							520			557									
MW-34-100	07/12/2007	MW-91-130	FD							521			558									
MW-34-100	07/25/2007	MW-34-100-131	N							627			560									
MW-34-100	08/08/2007	MW-34-100-132	N							670			596									
MW-34-100	08/22/2007	MW-34-100-133	N							490			550									
MW-34-100	09/06/2007	MW-34-100-134	N							581			551									
MW-34-100	09/06/2007	MW-91-134	FD							516			546									
MW-34-100	09/19/2007	MW-34-100-135	N							603			501									
MW-34-100	10/03/2007	MW-34-100-136	N							609 J			521									
MW-34-100	10/03/2007	MW-93-136	FD							424 J			513									
MW-34-100	05/06/2008	MW-34-100-143	N							228			234									
MW-34-100	05/06/2008	MW-91-143	FD										238									
MW-35-60	04/15/2004	MW-35S-022	N							5.4			4.8									
MW-35-60	06/10/2004	MW-35-60-030	N				100			18.2			19.7									
MW-35-60	09/22/2004	MW-35-060-043	N							23.7			27.5									
MW-35-60	12/13/2004	MW-35-60-049	N							27			26.8									
MW-35-60	03/15/2005	MW-35-060-056	N							37.5			33.8									
MW-35-60	06/13/2005	MW-35-060-070	N							34.1			33.6									
MW-35-60	10/07/2005	MW-35-060-081	N							28			32.5									
MW-35-60	10/07/2005	MW-97-081	FD							32			35.1 J									
MW-35-60	12/14/2005	MW-35-060-087	N							32.5			32.5									
MW-35-60	12/14/2005	MW-97-087	FD							28.6			33.3									
MW-35-60	03/14/2006	MW-35-060-093	N							24.3			31.6									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-35-60	05/01/2006	MW-35-060-098	N							26.4			25.7									
MW-35-60	05/02/2006	MW-35-060-CIS	N	50 U	2 U	1.5	87.5	1 U	1 U	38	1 U	1.21		1 U	0.2 U	8.56	2.15	1.19	1 U	1 U	3.11	23.3 J
MW-35-60	10/12/2006	MW-35-060-110	N							29.1			28.6									
MW-35-60	03/08/2007	MW-35-060-121	N							35.1			31.3									
MW-35-60	03/08/2007	MW-93-121	FD							32.7			30.8									
MW-35-60	10/01/2007	MW-35-060-136	N							21.3			24.8									
MW-35-60	10/01/2007	MW-97-136	FD							20.6			24.8									
MW-35-135	04/15/2004	MW-35D-022	N							1 U			0.75 U									
MW-35-135	06/10/2004	MW-35-135-030	N				64			12.9			11.4									
MW-35-135	09/23/2004	MW-35-135-043	N							6.3			7.6									
MW-35-135	09/23/2004	MW-94-043	FD							6.6			7.9									
MW-35-135	12/13/2004	MW-35-135-049	N							16			15.6 J									
MW-35-135	12/13/2004	MW-93-049	FD							14.1			15.7 J									
MW-35-135	03/15/2005	MW-35-135-056	N							21.4			23									
MW-35-135	06/13/2005	MW-35-135-070	N							17.6			17.6									
MW-35-135	10/07/2005	MW-35-135-081	N							17.8			21.2									
MW-35-135	12/14/2005	MW-35-135-087	N							22.8			25.7									
MW-35-135	03/10/2006	MW-35-135-093	N							24			28									
MW-35-135	03/10/2006	MW-95-093	FD							25.7			26.5									
MW-35-135	05/02/2006	MW-35-135-098	N							20.7			21									
MW-35-135	05/02/2006	MW-35-135-CIS	N	50 U	2 U	1.37	53.4	1 U	1 U	19.6	1 U	1 U		1 U	0.2 U	20.9	1.01	1.27	1 U	1 U	1.84	18.2 J
MW-35-135	10/12/2006	MW-35-135-110	N							34.6			35.4									
MW-35-135	10/12/2006	MW-93-110	FD							30.8			34									
MW-35-135	03/08/2007	MW-35-135-121	N							39.2			32									
MW-35-135	05/04/2007	CIS-027	N			1.09	46.1			26.2		1 U	27.2	1 U		21.1	1 U	1.25			1.4	10 U
MW-35-135	05/04/2007	CIS-085	FD			1.07	44.2			25.2		1 U	27.8	1 U		20.3	1 U	1.2			1.48	10 U
MW-35-135	10/01/2007	MW-35-135-136	N							28.9			32.4									
MW-36-20	05/18/2004	MW-36-20-01	N							2.4			2.6									
MW-36-20	06/15/2004	MW-36-20-031	N				128			1 U			1 U									
MW-36-20	09/21/2004	MW-36-020-043	N							1 U			1 U									
MW-36-20	10/19/2004	MW-36-20-045	N							2.4			2 U									
MW-36-20	11/17/2004	MW-36-020-047	N							6.5 J			1 U									
MW-36-20	11/17/2004	MW-92-047	FD							1 UJ			1 U									
MW-36-20	12/14/2004	MW-36-020-049	N							1 U			2 UJ									
MW-36-20	01/11/2005	MW-36-020-051	N							1 U			2 U									
MW-36-20	02/07/2005	MW-36-20-053	N							1.4			1 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-36-20	03/09/2005	MW-36-020-056	N							1 U			2 U									
MW-36-20	04/05/2005	MW-36-020-060	N							1 U			1 U									
MW-36-20	05/03/2005	MW-36-020-064	N							1 U			1 U									
MW-36-20	10/03/2005	MW-36-020-081	N							1 U			1 U									
MW-36-20	12/15/2005	MW-36-020-087	N							1 U			2 U									
MW-36-20	03/07/2006	MW-36-020-093	N							1 U			1 U									
MW-36-20	05/01/2006	MW-36-020-098	N							1 U			1 U									
MW-36-20	10/02/2006	MW-36-020-110	N							1 U			1 U									
MW-36-20	10/03/2007	MW-36-020-136	N							1 U			1 U									
MW-36-40	05/18/2004	MW-36-40-01	N							1.5			1 U									
MW-36-40	06/16/2004	MW-36-40-031	N				158			1 U			1 U									
MW-36-40	09/21/2004	MW-36-040-043	N							1 U			1 U									
MW-36-40	10/19/2004	MW-36-40S-045	N							1 U			1 U									
MW-36-40	11/17/2004	MW-36-040-047	N							1 U			1 U									
MW-36-40	12/14/2004	MW-36-040-049	N							1 U			1 U									
MW-36-40	01/12/2005	MW-36-40-051	N							1 U			0.2 U									
MW-36-40	02/07/2005	MW-36-40-053	N							1 U			1 U									
MW-36-40	03/08/2005	MW-36-040-056	N							1 U			1 U									
MW-36-40	04/05/2005	MW-36-040-060	N							1 U			1 U									
MW-36-40	05/05/2005	MW-36-040-064	N							1 U			1 U									
MW-36-40	10/03/2005	MW-36-040-081	N							1 U			1 U									
MW-36-40	12/15/2005	MW-36-040-087	N							1 U			1 U									
MW-36-40	03/07/2006	MW-36-040-093	N							1 U			1 U									
MW-36-40	05/01/2006	MW-36-040-098	N							1 U			1 U									
MW-36-40	10/05/2006	MW-36-040-110	N							1 U			1 U									
MW-36-40	10/03/2007	MW-36-040-136	N							1 U			1 U									
MW-36-50	05/19/2004	MW-36-50-01	N							1.2			1 U									
MW-36-50	06/17/2004	MW-36-50-031	N				75.1			1 U			1 U									
MW-36-50	09/21/2004	MW-36-050-043	N							1 U			1 U									
MW-36-50	10/19/2004	MW-36-50-045	N							1 U			1 U									
MW-36-50	11/17/2004	MW-36-050-047	N							1 U			1 U									
MW-36-50	12/14/2004	MW-36-050-049	N							1 U			0.2 UJ									
MW-36-50	01/12/2005	MW-36-50-051	N							1 U			1 U									
MW-36-50	02/07/2005	MW-36-50-053	N							1 U			1 U									
MW-36-50	03/08/2005	MW-36-050-056	N							1 U			1 U									
MW-36-50	04/05/2005	MW-36-050-060	N							1 U			1 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-36-50	05/05/2005	MW-36-050-064	N							1 U			1 U									
MW-36-50	10/03/2005	MW-36-050-081	N							1 U			1 U									
MW-36-50	12/15/2005	MW-36-050-087	N							1 U			1 U									
MW-36-50	03/07/2006	MW-36-050-093	N							1 U			1 U									
MW-36-50	03/07/2006	MW-96-093	FD							1 U			1 U									
MW-36-50	05/01/2006	MW-36-050-098	N							1 U			0.2 U									
MW-36-50	10/05/2006	MW-36-050-110	N							1 U			0.2 U									
MW-36-50	10/10/2007	MW-36-050-136	N							2			0.2 U									
MW-36-70	05/19/2004	MW-36-70-01	N							1.6			1 U									
MW-36-70	06/17/2004	MW-36-70-031	N				75.4			1.2			1 U									
MW-36-70	09/22/2004	MW-36-70-043	N							1 U			1 U									
MW-36-70	10/20/2004	MW-36-70-045	N							1 U			1 U									
MW-36-70	11/17/2004	MW-36-070-047	N							1 U			1 U									
MW-36-70	12/14/2004	MW-36-070-049	N							1 U			0.2 UJ									
MW-36-70	01/11/2005	MW-36-070-051	N							1 U			1 U									
MW-36-70	02/07/2005	MW-36-70-053	N							1.2			0.21 U									
MW-36-70	03/08/2005	MW-36-070-056	N							1 U			1 U									
MW-36-70	04/05/2005	MW-36-070-060	N							1 U			1 U									
MW-36-70	05/03/2005	MW-36-070-064	N							1 U			1 U									
MW-36-70	10/03/2005	MW-36-070-081	N							1 U			1 U									
MW-36-70	12/15/2005	MW-36-070-087	N							1 U			1 U									
MW-36-70	02/10/2006	MW-36-070-091	N							1 U			10 U									
MW-36-70	03/07/2006	MW-36-070-093	N							1 U			1 U									
MW-36-70	04/06/2006	MW-36-070-095	N							1 U			1 U									
MW-36-70	05/01/2006	MW-36-070-098	N							1 U			1 U									
MW-36-70	06/13/2006	MW-36-070-102	N							1 U			0.2 UJ									
MW-36-70	07/11/2006	MW-36-070-104	N							1 U			1 U									
MW-36-70	08/09/2006	MW-36-070-106	N							1 U			0.2 U									
MW-36-70	09/07/2006	MW-36-070-108	N							1 U			0.2 U									
MW-36-70	10/02/2006	MW-36-070-110	N							1 U			0.2 U									
MW-36-70	12/14/2006	MW-36-070-115	N							1 U			0.2 U									
MW-36-70	03/07/2007	MW-36-070-121	N							1 U			0.2 U									
MW-36-70	05/01/2007	MW-36-070-125	N							1 U			0.2 U									
MW-36-70	10/09/2007	MW-36-070-136	N							1 U			0.2 U									
MW-36-90	05/18/2004	MW-36-90-01	N							3350			3660									
MW-36-90	06/15/2004	MW-36-90-031	N				38.7			3450			3270									

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Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-36-90	09/23/2004	MW-36-90-043	N							2780			3370									
MW-36-90	09/23/2004	MW-93-043	FD							2970			3420									
MW-36-90	10/19/2004	MW-36-90D-045	N							2940			3200									
MW-36-90	11/17/2004	MW-36-090-047	N							2700			2770									
MW-36-90	12/14/2004	MW-36-090-049	N							2130			2270									
MW-36-90	12/14/2004	MW-94-049	FD							2180			2270									
MW-36-90	01/12/2005	MW-36-90-051	N							1780			1970									
MW-36-90	01/12/2005	MW-92-051	FD							1800			1860									
MW-36-90	02/07/2005	MW-36-90-053	N							1610			1720									
MW-36-90	03/09/2005	MW-36-090-056	N							1380			1480									
MW-36-90	04/05/2005	MW-36-090-060	N							946			1040									
MW-36-90	05/03/2005	MW-36-090-064	N							623			705									
MW-36-90	07/25/2005	MW-36-090-074	N							343			344									
MW-36-90	08/17/2005	MW-36-090-077	N							336			346									
MW-36-90	09/08/2005	MW-36-090-079	N							301			267									
MW-36-90	10/03/2005	MW-36-090-081	N							286			302									
MW-36-90	11/02/2005	MW-36-090-083	N							247			256									
MW-36-90	12/15/2005	MW-36-090-087	N							219			240									
MW-36-90	01/12/2006	MW-36-090-089	N							223			245									
MW-36-90	02/10/2006	MW-36-090-091	N							71.4			71.8									
MW-36-90	03/07/2006	MW-36-090-093	N							27.5			33									
MW-36-90	04/04/2006	MW-36-090-095	N							15.7			23.5									
MW-36-90	05/01/2006	MW-36-090-098	N							18.3			22.8									
MW-36-90	06/13/2006	MW-36-090-102	N							9			10.9									
MW-36-90	07/11/2006	MW-36-090-104	N							11.1			12.2									
MW-36-90	08/09/2006	MW-36-090-106	N							8.2			9									
MW-36-90	09/07/2006	MW-36-090-108	N							7.7			8.8									
MW-36-90	10/02/2006	MW-36-090-110	N							8.5			9									
MW-36-90	10/02/2006	MW-94-110	FD							10.8			8.9									
MW-36-90	11/15/2006	MW-36-090-113	N							2.4			1 U									
MW-36-90	12/14/2006	MW-36-090-115	N							5.8 J			3.8 J									
MW-36-90	12/14/2006	MW-93-115	FD							3 J			4									
MW-36-90	01/10/2007	MW-36-090-117	N							9.7			6									
MW-36-90	02/05/2007	MW-36-090-119	N							4.9			5.4									
MW-36-90	03/07/2007	MW-36-090-121	N							3.7			3.1									
MW-36-90	04/03/2007	MW-36-090-123	N							3.2			2.9									

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Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-36-90	05/02/2007	MW-36-090-125	N							1.8			2									
MW-36-90	05/02/2007	MW-93-125	FD							1.8			1.9									
MW-36-90	06/12/2007	MW-36-090-128	N							2.8			2.6									
MW-36-90	07/12/2007	MW-36-090-130	N							3.1			2.9									
MW-36-90	08/07/2007	MW-36-090-132	N							3.6			3									
MW-36-90	09/06/2007	MW-36-090-134	N							3.6			2.9									
MW-36-90	10/09/2007	MW-36-090-136	N							2.9			3.2									
MW-36-100	05/21/2004	MW-36-100-001	N							3180			2980									
MW-36-100	06/15/2004	MW-36-100-031	N				54.6			2490			2800									
MW-36-100	08/26/2004	MW-36-100-041	N							2060			2370									
MW-36-100	08/26/2004	MW-90-041	FD							2080			2370									
MW-36-100	09/09/2004	MW-36-100-042	N							2190			2330									
MW-36-100	09/09/2004	MW-90-042	FD							2160			2260									
MW-36-100	09/23/2004	MW-36-100-043	N							2330			2710									
MW-36-100	10/06/2004	MW-36-100-044	N							2420			2750									
MW-36-100	10/06/2004	MW-90-044	FD							2410			2680									
MW-36-100	10/21/2004	MW-36-100-045	N							2300			2640									
MW-36-100	10/21/2004	MW-90-045	FD							2250			2620									
MW-36-100	11/02/2004	MW-36-100-046	N							2240			2490									
MW-36-100	11/17/2004	MW-36-100-047	N							2270			2150									
MW-36-100	12/02/2004	MW-36-100-048	N							1620			1860									
MW-36-100	12/02/2004	MW-90-048	FD							1570			1750									
MW-36-100	12/14/2004	MW-36-100-049	N							1810			1790									
MW-36-100	12/29/2004	MW-36-100-050	N							1580			1690									
MW-36-100	12/29/2004	MW-90-050	FD							1530			1720									
MW-36-100	01/12/2005	MW-36-100-051	N							1470			1520									
MW-36-100	01/12/2005	MW-90-051	FD							1510			1550									
MW-36-100	01/27/2005	MW-36-100-052	N							1420			1500									
MW-36-100	01/27/2005	MW-90-052	FD							1490			1420									
MW-36-100	02/09/2005	MW-36-100-053	N							1420			1440									
MW-36-100	02/22/2005	MW-36-100-054	N							1230			1430									
MW-36-100	02/22/2005	MW-90-054	FD							1250			1390									
MW-36-100	03/09/2005	MW-36-100-056	N							1200			1380									
MW-36-100	03/22/2005	MW-36-100-058	N							1180			1250									
MW-36-100	03/22/2005	MW-90-058	FD							1160			1230									
MW-36-100	04/04/2005	MW-36-100-060	N							981			1110									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-36-100	04/20/2005	MW-36-100-062	N							844			825									
MW-36-100	05/03/2005	MW-36-100-064	N							679			705									
MW-36-100	05/18/2005	MW-36-100-066	N							796 J			617									
MW-36-100	05/18/2005	MW-90-066	FD							624 J			620									
MW-36-100	06/02/2005	MW-36-100-068	N							441			518									
MW-36-100	07/19/2005	MW-36-100-074	N							635			398									
MW-36-100	08/15/2005	MW-36-100-077	N							410			391									
MW-36-100	08/15/2005	MW-90-077	FD							392			390									
MW-36-100	09/08/2005	MW-36-100-079	N							380			396 J									
MW-36-100	09/08/2005	MW-90-079	FD							454			397									
MW-36-100	10/05/2005	MW-36-100-081	N							370			383									
MW-36-100	11/03/2005	MW-36-100-083	N							368			315									
MW-36-100	12/13/2005	MW-36-100-087	N							333			306									
MW-36-100	01/12/2006	MW-36-100-089	N							288			287									
MW-36-100	02/09/2006	MW-36-100-091	N							288			307									
MW-36-100	03/13/2006	MW-36-100-093	N							531			540									
MW-36-100	04/05/2006	MW-36-100-095	N							492			554									
MW-36-100	05/02/2006	MW-36-100-098	N							517			532									
MW-36-100	06/15/2006	MW-36-100-102	N							465			496 J									
MW-36-100	07/13/2006	MW-36-100-104	N							497			528									
MW-36-100	08/09/2006	MW-36-100-106	N							474			551									
MW-36-100	09/08/2006	MW-36-100-108	N							561			556									
MW-36-100	10/11/2006	MW-36-100-110	N							629			556									
MW-36-100	11/14/2006	MW-36-100-113	N							764			657									
MW-36-100	12/11/2006	MW-36-100-115	N							513			586									
MW-36-100	01/10/2007	MW-36-100-117	N							554			571									
MW-36-100	02/05/2007	MW-36-100-119	N							474			538									
MW-36-100	03/08/2007	MW-36-100-121	N							454			436									
MW-36-100	04/02/2007	MW-36-100-123	N							378			366									
MW-36-100	05/02/2007	MW-36-100-125	N							348			297									
MW-36-100	06/14/2007	MW-36-100-128	N							192			181									
MW-36-100	07/12/2007	MW-36-100-130	N							219			180									
MW-36-100	08/07/2007	MW-36-100-132	N							187			159 J									
MW-36-100	09/06/2007	MW-36-100-134	N							184			157									
MW-36-100	10/10/2007	MW-36-100-136	N							196			228									
MW-37D	05/19/2004	MW-37D-027	N							960			930									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-37D	06/11/2004	MW-37D-030	N	50 U	4.2 U	10 U	55	3 U	3 U	854	3 U	5 U	951	5 U	0.5 U	50	5 U	10	3 U	5 U	3 U	10 U
MW-37D	06/11/2004	MW-37D-030	N		25 U					950												
MW-37D	09/24/2004	MW-37D-043	N	500 U	5 U	10 U	65	3 U	3 U	1310	3 U	8.5	1250	5 U	0.2 U	47.3	5 U	10 U	3 U	15 U	3 U	17.2
MW-37D	09/24/2004	MW-37D-043	N							1220												
MW-37D	09/24/2004	MW-92-043	FD	500 U	5 U	10 U	65.9	3 U	3 U	1160	3 U	9.6	1250	5 U	0.2 U	46.3	5 U	10	3 U	15 U	3 U	24.8
MW-37D	09/24/2004	MW-92-043	FD							1250												
MW-37D	12/14/2004	MW-37D-049	N	52 U	5 U	10 U	46.4	3.1 U	3.1 U	1490	3.1 U	5 U	1480	2.1 U	0.2 U	43.3	5 U	10 U	3.1 U	15 U	31.4 J	33 J
MW-37D	12/14/2004	MW-37D-049	N							1520												
MW-37D	12/14/2004	MW-95-049	FD	52 U	5 U	10 U	49.9	3.1 U	3.1 U	1490	3.1 U	5 U	1480	2.1 U	0.2 U	44.6	8.3	10 U	3.1 U	15 U	20.5 J	91.8 J
MW-37D	12/14/2004	MW-95-049	FD							1440												
MW-37D	03/11/2005	MW-37D-056	N	52 U	5 U	10 U	53.9	3.1 U	3.1 U	1540	3.1 U	5 U	1610	2.1 U	0.2 U	34.1	9.2	10 U	3.1 U	15 U	326	38.7
MW-37D	03/11/2005	MW-37D-056	N							1530												
MW-37D	06/15/2005	MW-37D-070	N	50 U	2 U	3.63	54.9	1 U	1 U	1420	1 U	1 U	1390	1 U	0.2 U	51.8	25.4	3.1	1 U	1 U	4	11
MW-37D	06/15/2005	MW-37D-070	N							1540												
MW-37D	10/04/2005	MW-37D-081	N		2 U	3.42	300 U	1 U	1 U	1970	1 U	10.4 U	1800	1 U	0.2 U	45.5	20 U	3.24	1 U	1 U	6	20 U
MW-37D	12/14/2005	MW-37D-087	N	52 U	3 U	5 U	300 U	1 U	2 U	1610	5 U	10 U	1680	2 U	0.2 U	36.6	20 U	5 U	5 U	1 U	14.5	20 U
MW-37D	03/13/2006	MW-37D-093	N		2 U	3.97	41	1 U	1 U	1860	1 U	2.12	1950	1 U	0.2 U	34	1 U	3.32	1 U	1 U	7.17	10 U
MW-37D	05/03/2006	MW-37D-098	N							1880			1970									
MW-37D	05/03/2006	MW-37D-CIS	N	50 U	2 U	3.79	44	1 U	1 U	1750 J	1.06	1 U		1 U	0.2 U	47.5	1 U	3.66	1 U	1 U	6.25	10 U
MW-37D	10/13/2006	MW-37D-110	N		2 U	3.67	42.2	1 U	1 U	1160	1 U	1 U	1330	1 U	0.2 U	48.3	1 U	3	1 U	1 U	6.08	10 U
MW-37D	12/14/2006	MW-37D-115	N		2 U	3.17	39.8	1 U	1 U	1130	1 U	1 U	1310	1 U	0.2 U	44.3	1 U	2.86	1 U	1 U	6.14	26.6
MW-37D	03/07/2007	MW-37D-121	N		2 U	3.17	40.9	1 U	1 U	1310	1.17	1 U	1420	1 U	0.2 U	45.1	1 U	3.42	1 U	1 U	5.03	10 U
MW-37D	05/03/2007	MW-37D-125	N		2 U	3.43	40.4	1 U	1 U	1260	1 U	1 U	1350	1 U	0.2 U	47.5	1.5	2.78	1 U	1 U	5.01	10 U
MW-37D	10/04/2007	MW-37D-136	N							794			834									
MW-37S	05/19/2004	MW-37S-027	N							3.4			1.9									
MW-37S	05/19/2004	MW-91-027	FD							2.8			1.8									
MW-37S	06/10/2004	MW-37S-030	N				110			2.7			2.8									
MW-37S	09/23/2004	MW-37S-043	N							6.8			7.5									
MW-37S	12/13/2004	MW-37S-049	N							7			6.2									
MW-37S	03/11/2005	MW-37S-056	N							5.4			7.4									
MW-37S	04/07/2005	MW-37S-060	N							5.4			5.9									
MW-37S	06/15/2005	MW-37S-070	N							2.6			2.1									
MW-37S	10/04/2005	MW-37S-081	N							6.6			7									
MW-37S	10/04/2005	MW-94-081	FD							6.5			7									
MW-37S	12/14/2005	MW-37S-087	N							7.1			8									
MW-37S	12/14/2005	MW-94-087	FD							7			7.6									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-37S	03/13/2006	MW-37S-093	N							7			7.7									
MW-37S	05/04/2006	MW-37S-098	N							9.3			8.3									
MW-37S	05/04/2006	MW-37S-CIS	N	50 U	2 U	2.26	61	1 U	1 U	10 U	1 U	1 U	8.1	1 U	0.2 U	19.9	1 U	1.37	1 U	1 U	8.99	10 U
MW-37S	05/04/2006	MW-94-098	FD										8									
MW-37S	10/13/2006	MW-37S-110	N							6.1			7.6									
MW-37S	03/07/2007	MW-37S-121	N							8.5			7.8									
MW-37S	10/04/2007	MW-37S-136	N							7.5			7.7									
MW-37S	10/04/2007	MW-94-136	FD							7.4			7.6									
MW-38D	05/05/2004	MW-38D-025	N							29.6			33.1									
MW-38D	06/10/2004	MW-38D-030	N				69			83.5			76.9									
MW-38D	09/23/2004	MW-38D-043	N							237			270									
MW-38D	12/14/2004	MW-38D-049	N							264			279									
MW-38D	03/11/2005	MW-38D-056	N							323			328									
MW-38D	06/17/2005	MW-38D-070	N							175			202									
MW-38D	10/07/2005	MW-38D-081	N							227			227									
MW-38D	03/10/2006	MW-38D-093	N							106			111									
MW-38D	10/12/2006	MW-38D-110	N							104			104									
MW-38D	05/03/2007	CIS-017	N			8.44	48.2			69.6		1 U	68.89999	1 U		79.7	1 U	1 U			6.15	10 U
MW-38D	07/17/2007	MW-38D_071707	N			7.85				72.1			104									
MW-38S	05/14/2004	MW-38S-026	N							373			332									
MW-38S	06/11/2004	MW-38S-030	N				38			493			509									
MW-38S	09/24/2004	MW-38S-043	N							891			894									
MW-38S	12/14/2004	MW-38S-049	N							1010			964									
MW-38S	03/11/2005	MW-38S-056	N							938			919									
MW-38S	06/17/2005	MW-38S-070	N							730			807									
MW-38S	10/07/2005	MW-38S-081	N							825			776									
MW-38S	03/10/2006	MW-38S-093	N							788			824									
MW-38S	05/04/2006	MW-38S-CIS	N	50 U	2 U	3.62	38.7	1 U	1 U	846	1 U	1 U	812	1 U	0.2 U	63.7	1 U	5.1	1 U	1 U	18.8	10 U
MW-38S	10/12/2006	MW-38S-110	N							905			846									
MW-38S	07/17/2007	MW-38S_071707	N			5 U				920			911									
MW-39-40	05/20/2004	MW-39-40-01	N							1 U			1 U									
MW-39-40	06/18/2004	MW-39-40-031	N				57			1 U			1 U									
MW-39-40	09/24/2004	MW-39-40-043	N							1 U			1 U									
MW-39-40	10/20/2004	MW-39-40-045	N							1 U			1 U									
MW-39-40	11/17/2004	MW-39-040-047	N							1.4			0.2 U									
MW-39-40	12/15/2004	MW-39-040-049	N							1 U			0.2 U									

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Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-39-40	01/12/2005	MW-39-40-051	N							2.6			1 U									
MW-39-40	02/08/2005	MW-39-40-053	N							1 U			0.2 U									
MW-39-40	03/09/2005	MW-39-040-056	N							1 U			1 U									
MW-39-40	04/05/2005	MW-39-040-060	N							1 U			1 U									
MW-39-40	05/05/2005	MW-39-040-064	N							1 U			0.2 U									
MW-39-40	06/16/2005	MW-39-040-070	N							1 U			0.2 U									
MW-39-40	10/04/2005	MW-39-040-081	N							1 U			0.2 U									
MW-39-40	12/16/2005	MW-39-040-087	N							1 U			0.2 U									
MW-39-40	03/07/2006	MW-39-040-093	N							1 U			1 U									
MW-39-40	05/02/2006	MW-39-040-098	N							1 U			1 U									
MW-39-40	10/05/2006	MW-39-040-110	N							1 U			0.2 U									
MW-39-40	12/14/2006	MW-39-040-115	N							1 U			1 U									
MW-39-40	03/05/2007	MW-39-040-121	N							1 U			1 U									
MW-39-40	05/03/2007	MW-39-040-125	N							1 U			1 UJ									
MW-39-40	10/08/2007	MW-39-040-136	N							1 U			1 U									
MW-39-50	05/20/2004	MW-39-50-01	N							3880			4140									
MW-39-50	06/18/2004	MW-39-50-031	N				39.8			3920			3480									
MW-39-50	09/24/2004	MW-39-50-043	N							2960			2960									
MW-39-50	10/20/2004	MW-39-50-045	N							2650			2630									
MW-39-50	11/18/2004	MW-39-050-047	N							1720			1850									
MW-39-50	12/15/2004	MW-39-050-049	N							1480			1470									
MW-39-50	01/14/2005	MW-39-050-051	N							1020			1000									
MW-39-50	02/08/2005	MW-39-50-053	N							800			819									
MW-39-50	03/09/2005	MW-39-050-056	N							372			422									
MW-39-50	04/06/2005	MW-39-050-060	N							237			282 J									
MW-39-50	05/03/2005	MW-39-050-064	N							204			206									
MW-39-50	06/16/2005	MW-39-050-070	N							55.4			66.2									
MW-39-50	10/04/2005	MW-39-050-081	N							4.7			10 U									
MW-39-50	01/12/2006	MW-39-050-089	N							1 U			10 U									
MW-39-50	03/08/2006	MW-39-050-093	N							1 U			1 U									
MW-39-50	05/02/2006	MW-39-050-098	N							1 U			1 U									
MW-39-50	10/05/2006	MW-39-050-110	N							1 U			0.2 U									
MW-39-50	10/08/2007	MW-39-050-136	N							1 U			0.2 U									
MW-39-60	05/20/2004	MW-39-60-01	N							2090			2070									
MW-39-60	06/18/2004	MW-39-60-031	N				34.7			3550			3540									
MW-39-60	06/18/2004	MW-91-031	FD				37.5			3580			3480									

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Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-39-60	09/24/2004	MW-39-60-043	N							3610			3810									
MW-39-60	10/20/2004	MW-39-60-045	N							3480			3590									
MW-39-60	10/20/2004	MW-91-045	FD							3440			3670									
MW-39-60	11/18/2004	MW-39-060-047	N							3130			3210									
MW-39-60	12/15/2004	MW-39-060-049	N							2650			2800									
MW-39-60	01/14/2005	MW-39-060-051	N							2880			1640									
MW-39-60	02/08/2005	MW-39-60-053	N							1650			1880									
MW-39-60	03/09/2005	MW-39-060-056	N							1300			1450									
MW-39-60	04/06/2005	MW-39-060-060	N							1080			914									
MW-39-60	04/06/2005	MW-93-060	FD							907			914									
MW-39-60	05/05/2005	MW-39-060-064	N							455			450									
MW-39-60	05/05/2005	MW-92-064	FD							509			460									
MW-39-60	06/16/2005	MW-39-060-070	N							198			213									
MW-39-60	10/04/2005	MW-39-060-081	N							79.6 J			72.3									
MW-39-60	12/16/2005	MW-39-060-087	N							20.4			20.4									
MW-39-60	03/08/2006	MW-39-060-093	N							2.7			7.1									
MW-39-60	03/08/2006	MW-97-093	FD							2.4			6.9									
MW-39-60	05/02/2006	MW-39-060-098	N							1.4			1.1									
MW-39-60	05/02/2006	MW-39-060-CIS	N	50 U	2 U	2.21	87.8	1 U	1 U	4.07	1 U	1 U		1 U	0.2 U	10.9	1.2	1 U	1 U	1 U	9.27	10 U
MW-39-60	10/05/2006	MW-39-060-110	N							1 U			1 U									
MW-39-60	10/05/2006	MW-95-110	FD							1 U			2 U									
MW-39-60	10/08/2007	MW-39-060-136	N							1 U			0.2 U									
MW-39-70	05/20/2004	MW-39-70-01	N							6980			5880									
MW-39-70	06/18/2004	MW-39-70-031	N				28.7			8490			8210									
MW-39-70	09/24/2004	MW-39-70-043	N							6360			5590									
MW-39-70	10/21/2004	MW-39-70-045	N							5940			6410									
MW-39-70	11/18/2004	MW-39-070-047	N							6390			7600									
MW-39-70	12/15/2004	MW-39-070-049	N							5860			5040									
MW-39-70	01/12/2005	MW-39-70-051	N							4860			5310									
MW-39-70	02/08/2005	MW-39-70-053	N							6800			6640									
MW-39-70	03/09/2005	MW-39-070-056	N							4010 J			4310									
MW-39-70	03/09/2005	MW-96-056	FD							5310 J			4340									
MW-39-70	04/05/2005	MW-39-070-060	N							2080			2280									
MW-39-70	05/05/2005	MW-39-070-064	N							1270			1320									
MW-39-70	06/16/2005	MW-39-070-070	N							576			799									
MW-39-70	10/04/2005	MW-39-070-081	N							754			840									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-39-70	12/16/2005	MW-39-070-087	N							1080			1240									
MW-39-70	02/10/2006	MW-39-070-091	N							340			338									
MW-39-70	03/08/2006	MW-39-070-093	N							169			200									
MW-39-70	04/06/2006	MW-39-070-095	N							204			223									
MW-39-70	05/02/2006	MW-39-070-098	N							123			137									
MW-39-70	06/14/2006	MW-39-070-102	N							94.6			107 J									
MW-39-70	07/12/2006	MW-39-070-104	N							66.7			77 J									
MW-39-70	08/10/2006	MW-39-070-106	N							86.2			89.6									
MW-39-70	09/07/2006	MW-39-070-108	N							153			155									
MW-39-70	10/05/2006	MW-39-070-110	N							103			112									
MW-39-70	12/14/2006	MW-39-070-115	N							94			101									
MW-39-70	03/05/2007	MW-39-070-121	N							37.2			35									
MW-39-70	05/03/2007	MW-39-070-125	N							10.4												
MW-39-70	06/07/2007	MW-39-070-125R	N							4.3			4.5									
MW-39-70	10/08/2007	MW-39-070-136	N							6.2			5.5									
MW-39-80	05/20/2004	MW-39-80-01	N							12900			10900									
MW-39-80	06/17/2004	MW-39-80-031	N				22.1			10300			10000									
MW-39-80	09/24/2004	MW-39-80-043	N							7570			8470									
MW-39-80	10/20/2004	MW-39-80-045	N							7480			8310									
MW-39-80	11/18/2004	MW-39-080-047	N							8850			9680									
MW-39-80	12/15/2004	MW-39-080-049	N							8320			9430									
MW-39-80	01/14/2005	MW-39-080-051	N							11200			8270									
MW-39-80	02/08/2005	MW-39-80-053	N							8220			7750									
MW-39-80	02/08/2005	MW-92-053	FD							7750			7890									
MW-39-80	03/09/2005	MW-39-080-056	N							7240			7460									
MW-39-80	04/06/2005	MW-39-080-060	N							4570			4820									
MW-39-80	05/03/2005	MW-39-080-064	N							3510			3430									
MW-39-80	06/16/2005	MW-39-080-070	N							1930			2220									
MW-39-80	07/25/2005	MW-39-080-074	N							1990			2060									
MW-39-80	08/17/2005	MW-39-080-077	N							2460			2370									
MW-39-80	09/06/2005	MW-39-080-079	N							4880			2990									
MW-39-80	10/04/2005	MW-39-080-081	N							2770			3000									
MW-39-80	11/02/2005	MW-39-080-083	N							3020			3200									
MW-39-80	12/15/2005	MW-39-080-087	N							2570			2740									
MW-39-80	01/12/2006	MW-39-080-089	N							2060			2280									
MW-39-80	02/10/2006	MW-39-080-091	N							1610			1750									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-39-80	03/08/2006	MW-39-080-093	N							1400			1420									
MW-39-80	04/06/2006	MW-39-080-095	N							1120			1200									
MW-39-80	05/02/2006	MW-39-080-098	N							1450			1410									
MW-39-80	06/14/2006	MW-39-080-102	N							934			1000 J									
MW-39-80	07/12/2006	MW-39-080-104	N							750			830 J									
MW-39-80	08/10/2006	MW-39-080-106	N							447			481									
MW-39-80	09/07/2006	MW-39-080-108	N							1160			1160									
MW-39-80	10/05/2006	MW-39-080-110	N							594			580									
MW-39-80	11/15/2006	MW-39-080-113	N							422			339									
MW-39-80	12/14/2006	MW-39-080-115	N							272			326									
MW-39-80	01/10/2007	MW-39-080-117	N							292			302									
MW-39-80	02/08/2007	MW-39-080-119	N							247			286									
MW-39-80	03/05/2007	MW-39-080-121	N							144			151									
MW-39-80	04/04/2007	MW-39-080-123	N							126			112									
MW-39-80	05/03/2007	MW-39-080-125	N							146			156									
MW-39-80	06/12/2007	MW-39-080-128	N							72.7			83.6									
MW-39-80	07/12/2007	MW-39-080-130	N							56.2			62.8									
MW-39-80	08/08/2007	MW-39-080-132	N							45.2			43.3									
MW-39-80	09/06/2007	MW-39-080-134	N							65.7			65.3									
MW-39-80	10/08/2007	MW-39-080-136	N							48.3			58.6									
MW-39-100	05/21/2004	MW-39-100-001	N							11900			10300 J									
MW-39-100	05/21/2004	MW-92-001	FD							13700			12900 J									
MW-39-100	06/15/2004	MW-39-100-031	N				23.3			11500			12500									
MW-39-100	06/15/2004	MW-90-031	FD				23.3			12100			12300									
MW-39-100	09/23/2004	MW-39-100-043	N							11400			11600									
MW-39-100	10/21/2004	MW-39-100-045	N							10600			11400									
MW-39-100	11/17/2004	MW-39-100-047	N							11100			11300									
MW-39-100	11/17/2004	MW-91-047	FD							12700			11300									
MW-39-100	12/15/2004	MW-39-100-049	N							11000			10900									
MW-39-100	01/12/2005	MW-39-100-051	N							9820			10100									
MW-39-100	01/27/2005	MW-39-100-052	N							10200			9930									
MW-39-100	02/09/2005	MW-39-100-053	N							9480			9180									
MW-39-100	02/09/2005	MW-90-053	FD							9710			9260									
MW-39-100	03/10/2005	MW-39-100-056	N							8160			8940									
MW-39-100	04/06/2005	MW-39-100-060	N							8230			8220									
MW-39-100	05/09/2005	MW-39-100-064	N							8490			7980									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-39-100	05/09/2005	MW-90-064	FD							8250			7720									
MW-39-100	06/17/2005	MW-39-100-070	N							6030			6980									
MW-39-100	07/19/2005	MW-39-100-074	N							5490			5500									
MW-39-100	07/19/2005	MW-91-074	FD							5450			5450									
MW-39-100	08/17/2005	MW-39-100-077	N							4050			4230									
MW-39-100	09/06/2005	MW-39-100-079	N							6480			4540									
MW-39-100	10/04/2005	MW-39-100-081	N							3950			4010									
MW-39-100	11/02/2005	MW-39-100-083	N							3480			3580									
MW-39-100	11/02/2005	MW-90-083	FD							3410			3650									
MW-39-100	12/13/2005	MW-39-100-087	N							3440			3640									
MW-39-100	01/12/2006	MW-39-100-089	N							4280			4720									
MW-39-100	02/09/2006	MW-39-100-091	N							4310			4500									
MW-39-100	03/13/2006	MW-39-100-093	N							4640			4070									
MW-39-100	04/05/2006	MW-39-100-095	N							4050			4470									
MW-39-100	04/05/2006	MW-91-095	FD							4330			4460									
MW-39-100	05/02/2006	MW-39-100-098	N							3480			3680									
MW-39-100	06/14/2006	MW-39-100-102	N							3250			3270									
MW-39-100	07/13/2006	MW-39-100-104	N							3470			3790									
MW-39-100	08/10/2006	MW-39-100-106	N							3440			3230									
MW-39-100	08/10/2006	MW-90-106	FD							3410			3170									
MW-39-100	09/08/2006	MW-39-100-108	N							3780			3290									
MW-39-100	10/11/2006	MW-39-100-110	N							3500			3370									
MW-39-100	11/15/2006	MW-39-100-113	N							3190			2850									
MW-39-100	11/15/2006	MW-91-113	FD							3060			2960									
MW-39-100	12/12/2006	MW-39-100-115	N							3350			3820									
MW-39-100	01/10/2007	MW-39-100-117	N							2560			2930									
MW-39-100	02/08/2007	MW-39-100-119	N							2400			2880									
MW-39-100	03/12/2007	MW-39-100-121	N							2770			2850									
MW-39-100	04/04/2007	MW-39-100-123	N							2990			3190									
MW-39-100	05/03/2007	MW-39-100-125	N							2920			2670									
MW-39-100	06/13/2007	MW-39-100-128	N							2730			2530									
MW-39-100	07/12/2007	MW-39-100-130	N							2430			2020									
MW-39-100	08/07/2007	MW-39-100-132	N							1780			1830									
MW-39-100	09/07/2007	MW-39-100-134	N							1690			1660									
MW-39-100	10/10/2007	MW-39-100-136	N							1840			1660									
MW-40D	05/10/2004	MW-40D-026	N							38.6			37.5									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-40D	06/14/2004	MW-40D-031	N				127			28.8			25.6									
MW-40D	09/22/2004	MW-40D-043	N							30			34.1									
MW-40D	09/22/2004	MW-91-043	FD							30.6			31.5									
MW-40D	12/16/2004	MW-40D-049	N							33.2			38.5									
MW-40D	12/16/2004	MW-97-049	FD							32.4			36.8									
MW-40D	03/10/2005	MW-40D-056	N							63.7			58.6									
MW-40D	06/16/2005	MW-40D-070	N							6.4			7.6									
MW-40D	10/05/2005	MW-40D-081	N							67			57.4									
MW-40D	12/13/2005	MW-40D-087	N							78.10001			83.5									
MW-40D	03/08/2006	MW-40D-093	N							76.7			89.9									
MW-40D	05/03/2006	MW-40D-098	N							85.3			79.8									
MW-40D	10/05/2006	MW-40D-110	N							86.1			104									
MW-40D	12/13/2006	MW-40D-115	N							99			110									
MW-40D	03/09/2007	MW-40D-121	N							91.6			104									
MW-40D	05/04/2007	CIS-005	N			4.36	64			79.6		1.12	78	1 U		45.8	1.4	2.12			5.49	10 U
MW-40D	10/04/2007	MW-40D-136	N							104			112									
MW-40S	05/11/2004	MW-40S-026	N							2.3			2.1									
MW-40S	06/15/2004	MW-40S-031	N				44			4.7			4.7									
MW-40S	09/22/2004	MW-40S-043	N							6.8			7.7									
MW-40S	12/16/2004	MW-40S-049	N							7.8			8.2									
MW-40S	03/10/2005	MW-40S-056	N							5.5			5.5									
MW-40S	04/07/2005	MW-40S-060	N							4.4			4.6									
MW-40S	06/16/2005	MW-40S-070	N							5.3			6.3									
MW-40S	10/05/2005	MW-40S-081	N							4.4			4.9									
MW-40S	12/13/2005	MW-40S-087	N							5.1			5.1 J									
MW-40S	03/08/2006	MW-40S-093	N							3.9			5.2									
MW-40S	05/03/2006	MW-40S-098	N							6.7			5.7									
MW-40S	05/03/2006	MW-40S-CIS	N	50 U	2 U	1.6	103	1 U	1 U	6.63	1 U	1 U		1 U	0.2 U	8.59	1 U	7.37	1 U	1 U	9.21	10 U
MW-40S	05/03/2006	MW-97-098	FD							7.2			5.6									
MW-40S	10/05/2006	MW-40S-110	N							5.1			5.2									
MW-40S	10/04/2007	MW-40S-136	N							7.4			5.7									
MW-41D	11/18/2004	MW-41D-047	N							8.1			2 U									
MW-41D	12/15/2004	MW-41D-049	N							1 U			1 U									
MW-41D	03/11/2005	MW-41D-056	N							1 U			1 U									
MW-41D	06/14/2005	MW-41D-070	N							2.8			1 U									
MW-41D	10/05/2005	MW-41D-081	N							1 U			1 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-41D	12/16/2005	MW-41D-087	N							1 U			1 U									
MW-41D	03/15/2006	MW-41D-093	N							1 U			1 U									
MW-41D	05/05/2006	MW-41D-098	N							1.4			1 U									
MW-41D	10/04/2006	MW-41D-110	N							1 U			1 U									
MW-41D	03/07/2007	MW-41D-121	N							1 U			1 U									
MW-41D	03/07/2007	MW-95-121	FD							1 U			1 U									
MW-41D	10/03/2007	MW-41D-136	N							1.3			1 U									
MW-41M	11/18/2004	MW-41M-047	N							3.5			4.1									
MW-41M	12/15/2004	MW-41M-049	N							5.2			5.3									
MW-41M	03/11/2005	MW-41M-056	N							4.9			8.1									
MW-41M	06/14/2005	MW-41M-070	N							5.4 J			4.8									
MW-41M	06/14/2005	MW-98-070	FD							7.9 J			4.6									
MW-41M	10/05/2005	MW-41M-081	N							5			5.4									
MW-41M	12/16/2005	MW-41M-087	N							6.5			8.9									
MW-41M	03/13/2006	MW-41M-093	N							7.4			8.5									
MW-41M	05/05/2006	MW-41M-098	N							9.8			8.8									
MW-41M	10/05/2006	MW-41M-110	N							9.7			10.2									
MW-41M	10/05/2006	MW-96-110	FD							10.4			10.5									
MW-41M	03/08/2007	MW-41M-121	N							12			10									
MW-41M	10/03/2007	MW-41M-136	N							8.8			10.5									
MW-41S	11/18/2004	MW-41S-047	N							7.3			7.4									
MW-41S	12/16/2004	MW-41S-049	N							11			11.8									
MW-41S	03/10/2005	MW-41S-056	N							15.6			16.8									
MW-41S	06/14/2005	MW-41S-070	N							19			11.3									
MW-41S	10/05/2005	MW-41S-081	N							17.7			17									
MW-41S	10/05/2005	MW-95-081	FD							15.3			17.3									
MW-41S	12/16/2005	MW-41S-087	N							15.8			18.2									
MW-41S	12/16/2005	MW-95-087	FD							16.1			18.4									
MW-41S	03/13/2006	MW-41S-093	N							18			17.6									
MW-41S	05/05/2006	MW-41S-098	N							18.3			19.2									
MW-41S	05/05/2006	MW-95-098	FD							17.2			19.2									
MW-41S	10/05/2006	MW-41S-110	N							19			19.6									
MW-41S	03/08/2007	MW-41S-121	N							20.9			19.9									
MW-41S	10/03/2007	MW-41S-136	N							17.7			19.5									
MW-41S	10/03/2007	MW-95-136	FD							18.2			19.6									
MW-42-30	02/23/2005	MW-42-30-054	N				500 U			1 U			1 U									

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Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-42-30	03/16/2005	MW-42-030-057	N				500 U			1 U			1 U									
MW-42-30	10/07/2005	MW-42-030-081	N							1 U			1 U									
MW-42-30	12/15/2005	MW-42-030-087	N							1 U			1 U									
MW-42-30	03/07/2006	MW-42-030-093	N							1 U			1 U									
MW-42-30	05/02/2006	MW-42-030-098	N							1 U			1 U									
MW-42-30	10/03/2006	MW-42-030-110	N							1 U			1 U									
MW-42-30	03/07/2007	MW-42-030-121	N							1 U			0.2 U									
MW-42-30	10/04/2007	MW-42-030-136	N							1 U			1 U									
MW-42-55	02/23/2005	MW-42-55-054	N				500 U			1 U			1 U									
MW-42-55	03/16/2005	MW-42-055-057	N				500 U			1 U			1 U									
MW-42-55	10/07/2005	MW-42-055-081	N							1 U			1 U									
MW-42-55	12/15/2005	MW-42-055-087	N							1 U			1 U									
MW-42-55	03/07/2006	MW-42-055-093	N							1 U			1 U									
MW-42-55	05/02/2006	MW-42-055-098	N							1 U			1 U									
MW-42-55	10/03/2006	MW-42-055-110	N							1 U			1 U									
MW-42-55	12/14/2006	MW-42-055-115	N							1 U			2 U									
MW-42-55	03/07/2007	MW-42-055-121	N							1 U			0.2 U									
MW-42-55	03/07/2007	MW-97-121	FD							1 U			0.2 U									
MW-42-55	05/01/2007	MW-42-055-125	N							1 U			1 U									
MW-42-55	10/04/2007	MW-42-055-136	N							1 U			1 U									
MW-42-55	05/06/2008	MW-42-055-143	N							1 U			1.05 U									
MW-42-65	02/24/2005	MW-42-065-054	N				500 U			2.8 UJ			1 U									
MW-42-65	03/16/2005	MW-42-065-057	N				500 U			1 U			1 U									
MW-42-65	10/07/2005	MW-42-065-081	N							1 U			1 U									
MW-42-65	12/15/2005	MW-42-065-087	N							1 U			1 U									
MW-42-65	03/07/2006	MW-42-065-093	N							1 U			1 U									
MW-42-65	05/02/2006	MW-42-065-098	N							1 U			1 U									
MW-42-65	10/03/2006	MW-42-065-110	N							1 U			1 U									
MW-42-65	12/14/2006	MW-42-065-115	N							1 U			2 U									
MW-42-65	03/07/2007	MW-42-065-121	N							1 U			0.2 U									
MW-42-65	05/01/2007	MW-42-065-125	N							1 U			1 U									
MW-42-65	10/03/2007	MW-42-065-136	N							1 U			1 U									
MW-42-65	05/06/2008	MW-42-065-143	N							1 U			1.05 U									
MW-43-25	03/07/2005	MW-43-025-055	N	52 U						1 U			0.2 U									
MW-43-25	03/15/2005	MW-43-025-057	N				500 U			1 U			0.2 U									
MW-43-25	06/20/2005	MW-43-025-070	N							1 U			0.2 U									

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Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-43-25	10/04/2005	MW-43-025-081	N							1 U			0.2 U									
MW-43-25	12/16/2005	MW-43-025-087	N							1 U			0.2 U									
MW-43-25	03/10/2006	MW-43-025-093	N							1 U			0.2 U									
MW-43-25	05/04/2006	MW-43-025-098	N							1 U			0.2 U									
MW-43-25	10/02/2006	MW-43-025-110	N							1 U			0.2 U									
MW-43-25	03/06/2007	MW-43-025-121	N							1 U			0.2 U									
MW-43-25	10/02/2007	MW-43-025-136	N							1 U			1 U									
MW-43-25	12/10/2007	MW-43-025-138	N		3 U	23	300 U	1 U	2 U	1 U	5 U	10 U		1 U	0.2 U	10.8	20 U	5 U	5 U	1 U	5 U	20 U
MW-43-25	03/10/2008	MW-43-025-141	N		3 U	18.9	300 U	1 U	2 U	1 U	5 U	10 U		2 U	0.2 U	10.5	20 U	5 U	5 U	1 U	5 U	20 U
MW-43-25	05/07/2008	MW-43-025-143	N		5 U	24.4	500 U	1.1	2 U	4.6	5 U	10 U		5.9	0.2 U	15	20 U	5 U	5 U	1 U	5 U	20 U
MW-43-75	03/07/2005	MW-43-075-055	N	52 U						1 U			1 U									
MW-43-75	03/15/2005	MW-43-075-057	N				500 U			1 U			1 U									
MW-43-75	06/20/2005	MW-43-075-070	N							1 U			1 U									
MW-43-75	07/26/2005	MW-43-075-074	N							1 U			1 U									
MW-43-75	08/16/2005	MW-43-075-077	N							5.4			1 U									
MW-43-75	09/08/2005	MW-43-075-079	N							1 U			1 U									
MW-43-75	10/04/2005	MW-43-075-081	N							1 UJ			1 U									
MW-43-75	11/03/2005	MW-43-075-083	N							1 U			2 U									
MW-43-75	12/16/2005	MW-43-075-087	N							1 U			1 U									
MW-43-75	01/11/2006	MW-43-075-089	N							1 U			1 U									
MW-43-75	02/10/2006	MW-43-075-091	N							1 U			1 U									
MW-43-75	03/10/2006	MW-43-075-093	N							1 U			1 U									
MW-43-75	04/03/2006	MW-43-075-095	N							1 U			1 U									
MW-43-75	05/04/2006	MW-43-075-098	N							1 U			1 U									
MW-43-75	10/02/2006	MW-43-075-110	N							1 U			1 U									
MW-43-75	12/12/2006	MW-43-075-115	N							1 U			1 U									
MW-43-75	03/06/2007	MW-43-075-121	N							1 U			1 U									
MW-43-75	04/30/2007	MW-43-075-125	N							1 U			1 U									
MW-43-75	10/02/2007	MW-43-075-136	N							1 U			1 U									
MW-43-90	03/07/2005	MW-43-090-055	N	52 U						1 U			1 U									
MW-43-90	03/15/2005	MW-43-090-057	N				500 U			1 U			1 U									
MW-43-90	03/15/2005	MW-90-057	FD				500 U			1 U			1 U									
MW-43-90	06/20/2005	MW-43-090-070	N							1 U			1 U									
MW-43-90	06/20/2005	MW-99-070	FD							1 U			1 U									
MW-43-90	07/26/2005	MW-43-090-074	N							1.6 U			2 U									
MW-43-90	08/16/2005	MW-43-090-077	N							5.2 U			2 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-43-90	09/08/2005	MW-43-090-079	N							1 U			1 U									
MW-43-90	10/04/2005	MW-43-090-081	N							1 U			1 U									
MW-43-90	11/03/2005	MW-43-090-083	N							1 U			2 U									
MW-43-90	12/16/2005	MW-43-090-087	N							1 U			1 U									
MW-43-90	01/11/2006	MW-43-090-089	N							1 U			1 U									
MW-43-90	02/10/2006	MW-43-090-091	N							1 U			1 U									
MW-43-90	03/10/2006	MW-43-090-093	N							1 U			2 U									
MW-43-90	04/03/2006	MW-43-090-095	N							1 U			1 U									
MW-43-90	05/04/2006	MW-43-090-098	N							1 U			1 U									
MW-43-90	10/02/2006	MW-43-090-110	N							1 U			1 U									
MW-43-90	12/12/2006	MW-43-090-115	N							1 U			1 U									
MW-43-90	03/06/2007	MW-43-090-121	N							1 U			1 U									
MW-43-90	04/30/2007	MW-43-090-125	N							1 U			1 U									
MW-43-90	10/02/2007	MW-43-090-136	N							1 U			1 U									
MW-44-70	03/09/2006	MW-44-070-001	N							1 U			1 U									
MW-44-70	03/23/2006	MW-44-070-002A	N							1 U			1 UJ									
MW-44-70	04/04/2006	MW-44-070-095	N							1 U			1 U									
MW-44-70	05/04/2006	MW-44-070-098	N							1 U			1 U									
MW-44-70	06/13/2006	MW-44-070-102a	N							1 U			1 U									
MW-44-70	06/13/2006	MW-90-102	FD							1 U			1 U									
MW-44-70	06/15/2006	MW-44-070-102	N							1 U			1 U									
MW-44-70	10/04/2006	MW-44-070-110	N							1 U			1 U									
MW-44-70	12/14/2006	MW-44-070-115	N							1 U			1 U									
MW-44-70	03/09/2007	MW-44-070-121	N							1 U			1 U									
MW-44-70	05/03/2007	MW-44-070-125	N							1 U			0.2 U									
MW-44-70	10/04/2007	MW-44-070-136	N							1 U			0.2 U									
MW-44-70	05/07/2008	MW-44-070-143	N							1 U			0.2 U									
MW-44-115	03/14/2006	MW-44-115-001	N							730			735 J									
MW-44-115	03/22/2006	MW-44-115-002A	N							1970			1440									
MW-44-115	04/04/2006	MW-44-115-095	N							1620			1550									
MW-44-115	04/04/2006	MW-90-095	FD							1570			1570									
MW-44-115	04/20/2006	MW-44-115-096	N							1650			1680									
MW-44-115	04/20/2006	MW-90-096	FD							1610			1680									
MW-44-115	04/26/2006	MW-44-115-097	N							1580			1560									
MW-44-115	05/04/2006	MW-44-115-098	N							1870			1710									
MW-44-115	05/10/2006	MW-44-115-099	N							1550			1490									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-44-115	05/17/2006	MW-44-115-100	N							1880			1560									
MW-44-115	05/31/2006	MW-44-115-101	N							1580			1610									
MW-44-115	05/31/2006	MW-90-101	FD							1600			1610									
MW-44-115	06/13/2006	MW-44-115-102	N							1350			1420									
MW-44-115	06/28/2006	MW-44-115-103	N							1830			1600									
MW-44-115	07/12/2006	MW-44-115-104	N							1430			1700 J									
MW-44-115	07/26/2006	MW-44-115-105	N							1530			1290									
MW-44-115	08/09/2006	MW-44-115-106	N							1460			1230									
MW-44-115	08/23/2006	MW-44-115-107	N							1440			1370									
MW-44-115	09/07/2006	MW-44-115-108	N							1340			1380									
MW-44-115	09/21/2006	MW-44-115-109	N							1180			911									
MW-44-115	10/05/2006	MW-44-115-110	N							1310			1300									
MW-44-115	10/18/2006	MW-44-115-111	N							1380			1250									
MW-44-115	11/15/2006	MW-44-115-113	N							1480			1210									
MW-44-115	12/12/2006	MW-44-115-115	N							1090			1310									
MW-44-115	01/09/2007	MW-44-115-117	N							1260			1140									
MW-44-115	02/06/2007	MW-44-115-119	N							1020			1140									
MW-44-115	03/09/2007	MW-44-115-121	N							1340			1210									
MW-44-115	03/09/2007	MW-96-121	FD							1340			1200									
MW-44-115	04/02/2007	MW-44-115-123	N							1420			1210									
MW-44-115	05/04/2007	MW-44-115-125	N							1190			1080									
MW-44-115	06/14/2007	MW-44-115-128	N							1110			1030									
MW-44-115	07/10/2007	MW-44-115-130	N							1060			919									
MW-44-115	08/06/2007	MW-44-115-132	N							924			834									
MW-44-115	09/05/2007	MW-44-115-134	N							850			872									
MW-44-115	10/04/2007	MW-44-115-136	N							866			763									
MW-44-115	10/04/2007	MW-99-136	FD							830			783									
MW-44-115	12/11/2007	MW-44-115-138	N	3 U	5.4	300 U	1 U	2 U		766	5 U	10 U		2 U	0.2 U	72.9	20 U	5 U	5 U	1 U	7.1	20 U
MW-44-115	03/11/2008	MW-44-115-141	N	3 U	5 U	300 U	1 U	2 U		596	5 U	10 U		2 U	0.2 U	85.6	20 U	5 U	5 U	1 U	6.54	20 U
MW-44-115	05/08/2008	MW-44-115-143	N	5 U	6.93	500 U	1 U	2 U		590	5 U	10 U	620	5 U	0.2 U	83	20 U	5 U	5 U	2 U	6.5	38.3
MW-44-125	03/22/2006	MW-44-125-002A	N							430			362									
MW-44-125	04/04/2006	MW-44-125-095	N							374			372									
MW-44-125	04/20/2006	MW-44-125-096	N							504			461									
MW-44-125	04/26/2006	MW-44-125-097	N							485			480									
MW-44-125	04/26/2006	MW-90-097	FD							493			479									
MW-44-125	05/04/2006	MW-44-125-098	N							592			584									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-44-125	05/10/2006	MW-44-125-099	N							667			634 J									
MW-44-125	05/17/2006	MW-44-125-100	N							740			612									
MW-44-125	05/31/2006	MW-44-125-101	N							398			413									
MW-44-125	07/11/2006	MW-44-125-104	N							395			373									
MW-44-125	07/11/2006	MW-90-104	FD							335			365									
MW-44-125	07/26/2006	MW-44-125-105	N							177			155									
MW-44-125	07/26/2006	MW-90-105	FD							180			157									
MW-44-125	08/09/2006	MW-44-125-106	N							227			218									
MW-44-125	08/28/2006	MW-44-125-107	N							486			468									
MW-44-125	08/28/2006	MW-90-107	FD							540			462									
MW-44-125	09/07/2006	MW-44-125-108	N							297			314									
MW-44-125	09/07/2006	MW-91-108	FD							275			311									
MW-44-125	09/20/2006	MW-44-125-109	N							262			224									
MW-44-125	09/20/2006	MW-90-109	FD							261			226									
MW-44-125	10/05/2006	MW-44-125-110	N							280			284									
MW-44-125	10/18/2006	MW-44-125-111	N							327			304									
MW-44-125	10/18/2006	MW-90-111	FD							272			308									
MW-44-125	11/15/2006	MW-44-125-113	N							363			320									
MW-44-125	12/13/2006	MW-44-125-115	N							321			300									
MW-44-125	01/09/2007	MW-44-125-117	N							285			285									
MW-44-125	01/09/2007	MW-91-117	FD							268			284									
MW-44-125	02/06/2007	MW-44-125-119	N							190			213									
MW-44-125	03/09/2007	MW-44-125-121	N							287			258									
MW-44-125	04/03/2007	MW-44-125-123	N							272			296									
MW-44-125	05/03/2007	CIS-013	N			2.99	70.8			315	1 U		254	1 U		125	1 U	1 U		1 U	10 U	
MW-44-125	05/03/2007	CIS-087	FD							309			300									
MW-44-125	06/14/2007	MW-44-125-128	N							258			229									
MW-44-125	07/11/2007	MW-44-125-130	N							283			252									
MW-44-125	08/07/2007	MW-44-125-132	N							251			278									
MW-44-125	09/04/2007	MW-44-125-134	N							253			255									
MW-44-125	10/04/2007	MW-44-125-136	N							347			314									
MW-44-125	05/08/2008	MW-44-125-143	N							342			253									
MW-45-095a	03/24/2006	MW-45-095A-001B	N							216			259									
MW-45-095a	07/13/2006	MW-45-095a-002D	N							202			197									
MW-45-095a	05/04/2007	CIS-009	N			3.76	19.6			140	6.45		169	1.53		26.8	1 U	1 U		6.14	42.2	
MW-46-175	03/14/2006	MW-46-175-001	N							279			287									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-46-175	03/24/2006	MW-46-175-002A	N							173			213									
MW-46-175	04/07/2006	MW-46-175-095	N							186			208 J									
MW-46-175	05/04/2006	MW-46-175-098	N							237			222									
MW-46-175	05/18/2006	MW-46-175-100	N							268			227									
MW-46-175	05/31/2006	MW-46-175-101	N							169			139 J									
MW-46-175	06/15/2006	MW-46-175-102	N							211			233									
MW-46-175	06/30/2006	MW-46-175-103	N							160			112									
MW-46-175	06/30/2006	MW-90-103	FD							164			111									
MW-46-175	07/12/2006	MW-46-175-104	N							85.8			135 J									
MW-46-175	07/27/2006	MW-46-175-105	N							206			174									
MW-46-175	08/09/2006	MW-46-175-106	N							186			210									
MW-46-175	08/09/2006	MW-91-106	FD							214			223									
MW-46-175	08/25/2006	MW-46-175-107	N							136			137									
MW-46-175	09/07/2006	MW-46-175-108	N							170			183									
MW-46-175	09/21/2006	MW-46-175-109	N							244			190									
MW-46-175	10/05/2006	MW-46-175-110	N							192			194									
MW-46-175	10/05/2006	MW-97-110	FD							187			195									
MW-46-175	10/18/2006	MW-46-175-111	N							253			204									
MW-46-175	11/15/2006	MW-46-175-113	N							147			163									
MW-46-175	12/13/2006	MW-46-175-115	N							174			187									
MW-46-175	01/10/2007	MW-46-175-117	N							133			138									
MW-46-175	02/08/2007	MW-46-175-119	N							108			130									
MW-46-175	03/08/2007	MW-46-175-121	N							147			153									
MW-46-175	04/03/2007	MW-46-175-123	N							95.8			113									
MW-46-175	05/04/2007	CIS-022	N		2.71		29			114		1 U	86.4	1 U		196	1 U	1 U		3.56		10 U
MW-46-175	06/14/2007	MW-46-175-128	N							109			101									
MW-46-175	07/13/2007	MW-46-175-130	N							101			103									
MW-46-175	08/06/2007	MW-46-175-132	N							98.9			94									
MW-46-175	09/04/2007	MW-46-175-134	N							94.8			88.1									
MW-46-175	10/05/2007	MW-46-175-136	N							86.7			100									
MW-46-175	05/07/2008	MW-46-175-143	N							74.7			77.9									
MW-46-205	03/14/2006	MW-46-205-001	N							1 U			1 U									
MW-46-205	03/24/2006	MW-46-205-002A	N							1 U			1 U									
MW-46-205	04/07/2006	MW-46-205-095	N							1 U			1 UJ									
MW-46-205	05/04/2006	MW-46-205-098	N							1 U			1 U									
MW-46-205	06/15/2006	MW-46-205-102	N							1.8			1 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-46-205	07/13/2006	MW-46-205-104	N							3.5			1 U									
MW-46-205	08/10/2006	MW-46-205-106	N							1 U			1 U									
MW-46-205	09/07/2006	MW-46-205-108	N							2.3			2									
MW-46-205	10/05/2006	MW-46-205-110	N							2.3			2.1									
MW-46-205	12/13/2006	MW-46-205-115	N							3			3.2									
MW-46-205	03/08/2007	MW-46-205-121	N							5.4			4									
MW-46-205	05/04/2007	MW-46-205-125	N							3.1			3.9									
MW-46-205	10/05/2007	MW-46-205-136	N							4.6			3.7									
MW-46-205	05/07/2008	MW-46-205-143	N							4.25			4.52									
MW-47-55	03/23/2006	MW-47-055-001B	N							7.9			10.9 J									
MW-47-55	05/16/2006	MW-47-055-100	N							27.3			24									
MW-47-55	10/10/2006	MW-47-055-110	N							56.8			56.9									
MW-47-55	12/14/2006	MW-47-055-115	N							82			61.2									
MW-47-55	03/06/2007	MW-47-055-121	N							53			54.6									
MW-47-55	05/04/2007	CIS-006	N			1.35	54.4			31.6		1 U	30.3	1 U		8.05	1 U	1.46			2.4	10 U
MW-47-55	10/04/2007	MW-47-055-136	N							59.2			61.9									
MW-47-55	05/07/2008	MW-47-055-143	N							32.7			34.8									
MW-47-115	03/23/2006	MW-47-115-001B	N							1 U			2 UJ									
MW-47-115	05/16/2006	MW-47-115-100	N							5.1			1.4									
MW-47-115	10/10/2006	MW-47-115-110	N							6.9			3.5 U									
MW-47-115	12/14/2006	MW-47-115-115	N							6.1			7.9									
MW-47-115	03/06/2007	MW-47-115-121	N							10.8			10.6									
MW-47-115	05/04/2007	MW-47-115-125	N							13			14.1									
MW-47-115	10/04/2007	MW-47-115-136	N							12.2			11.6									
MW-47-115	05/07/2008	MW-47-115-143	N							18.3			18.2									
MW-48	05/18/2006	MW-48-001D	N							1 U			1 U									
MW-48	06/06/2006	MW-48-002C	N							1 U			1 U									
MW-48	10/06/2006	MW-48-110	N							1 U			1 U									
MW-48	12/15/2006	MW-48-115	N							1 U			2 U									
MW-48	03/07/2007	MW-48-121	N							1 U			1 U									
MW-48	05/01/2007	MW-48-125	N							1			1 U									
MW-48	10/04/2007	MW-48-136	N							1 U			1 U									
MW-48	12/14/2007	MW-48-138	N		3 U	5 U	300 U	1 U	2 U	1.1	5 U	10 U		2 U	0.2 U	13.6	20 U	5 U	5 U	1 U	17.3	20 U
MW-48	03/11/2008	MW-48-141	N		3 U	5 U	300 U	1 U	2 U	2.93	5 U	10 U		2 U	0.2 U	14.3	20 U	5 U	5 U	1 U	7.52	20 U
MW-48	05/07/2008	MW-48-143	N		5 U	5 U	500 U	1 U	2 U	1.4	5 U	10 U	1 U	5 U	0.2 U	19	20 U	5.24	5 U	2 U	5 U	20 U
MW-49-135	04/25/2006	MW-49-135-001C	N							1 U			1 UJ									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-49-135	05/18/2006	MW-49-135-100	N							1 U			1 U									
MW-49-135	10/12/2006	MW-49-135-110	N							1 U			1 U									
MW-49-135	12/15/2006	MW-49-135-115	N							1 U			1 U									
MW-49-135	03/09/2007	MW-49-135-121	N							1 U			1 U									
MW-49-135	05/04/2007	MW-49-135-125	N							1 U			0.2 U									
MW-49-135	10/10/2007	MW-49-135-136	N							2.8			1 U									
MW-49-275	04/25/2006	MW-49-275-001C	N							1 U			1 U									
MW-49-275	05/18/2006	MW-49-275-100	N							1 U			1 U									
MW-49-275	10/12/2006	MW-49-275-110	N							1 U			1 U									
MW-49-275	12/15/2006	MW-49-275-115	N							1 U			1 U									
MW-49-275	03/09/2007	MW-49-275-121	N							1 U			1 U									
MW-49-275	05/04/2007	MW-49-275-125	N							1 U			0.2 U									
MW-49-275	10/09/2007	MW-49-275-136	N							1 U			1 U									
MW-49-365	04/26/2006	MW-49-365-001C	N							1 U			2 U									
MW-49-365	05/16/2006	MW-49-365-100	N							1 U			2 U									
MW-49-365	10/12/2006	MW-49-365-110	N							1 U			2 U									
MW-49-365	12/15/2006	MW-49-365-115	N							1.1			2 U									
MW-49-365	03/09/2007	MW-49-365-121	N							1 U			2 U									
MW-49-365	05/04/2007	MW-49-365-125	N							1 U			0.2 U									
MW-49-365	10/09/2007	MW-49-365-136	N							1 U			2 U									
MW-50-095	05/09/2006	MW-50-095-001C	N							194			199									
MW-50-095	05/24/2006	MW-50-095-002B	N							221			218									
MW-50-095	10/10/2006	MW-50-095-110	N							277			278									
MW-50-095	12/12/2006	MW-50-095-115	N							262			273									
MW-50-095	03/07/2007	MW-50-095-121	N							372			274									
MW-50-095	05/02/2007	MW-50-095-125	N							264			304									
MW-50-095	10/04/2007	MW-50-095-136	N							216			217									
MW-50-095	05/07/2008	MW-50-095-143	N							187			154									
MW-50-095	05/07/2008	MW-92-143	FD							192			164									
MW-50-200	05/09/2006	MW-50-200-001C	N							7360			7750									
MW-50-200	05/24/2006	MW-50-200-002B	N							5910			5810									
MW-50-200	10/10/2006	MW-50-200-110	N							11800			9660									
MW-50-200	12/12/2006	MW-50-200-115	N							9250			10100									
MW-50-200	03/07/2007	MW-50-200-121	N							14600			12300									
MW-50-200	04/30/2007	MW-50-200-125	N							12100			10900									
MW-50-200	10/04/2007	MW-50-200-136	N							9780			9430									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-50-200	12/11/2007	MW-50-200-138	N		3 U	5 U	300 U	1 U	2 U	9340	5 U	10 U		2 U	0.2 U	44.3	20 U	5 U	5 U	1 U	5 U	20 U
MW-50-200	03/12/2008	MW-50-200-141	N		3 U	5 U	300 U	1 U	2 U	11800	5 U	10 U		2 U	0.2 U	40.4	20 U	6.21	5 U	1 U	5 U	20 U
MW-50-200	05/08/2008	MW-50-200-143	N		3 U	5 U	500 U	1 U	2 U	11000	5 U	10 U	10500	5 U	0.2 U	54	20 U	10.2	5 U	2 U	5 U	31.7
MW-51	05/12/2006	MW-51-110-001C	N							4630			4370									
MW-51	05/30/2006	MW-51-110-002C	N							4530			4130									
MW-51	10/06/2006	MW-51-110	N							4590			4560									
MW-51	12/12/2006	MW-51-115	N							5360			4620									
MW-51	03/06/2007	MW-51-121	N							5090			4690									
MW-51	05/01/2007	MW-51-125	N							5120			4670									
MW-51	10/05/2007	MW-51-136	N							4340			4500									
MW-51	12/11/2007	MW-51-138	N		3 U	5 U	300 U	1 U	2 U	4460	5 U	10 U		2 U	0.2 U	37.6	20 U	18.2	5 U	1 U	5 U	20 U
MW-51	03/11/2008	MW-51-141	N		3 U	5 U	300 U	1 U	2 U	4590	5 U	10 U		2 U	0.2 U	33.6	20 U	11.5	5 U	1 U	5 U	20 U
MW-51	05/08/2008	MW-51-143	N		3 U	5 U	500 U	1 U	2 U	4600	5 U	10 U		5.8	0.2 U	40	20 U	16.4	5 U	2 U	5 U	34.4
MW-52D	03/13/2007	MW-52D-031307	N							1 U			1 U									
MW-52D	05/01/2007	MW-52D-050107	N							1 U			1 U									
MW-52D	06/05/2007	MW-52D_060507	N							1 U			1 U									
MW-52D	07/12/2007	MW-52D-071007	N							1 U			1 U									
MW-52D	08/08/2007	MW-52D-080707	N							1 U			1 U									
MW-52D	09/05/2007	MW-52D_090407	N							1 U			1 U									
MW-52D	10/11/2007	MW-52D-101107	N							1 U			1 U									
MW-52D	05/07/2008	MW-52D-143	N							1 U			1.05 U									
MW-52M	03/13/2007	MW-52M-031307	N							1 U			1 U									
MW-52M	05/01/2007	MW-52M-050107	N							1 U			1 U									
MW-52M	06/05/2007	MW-52M_060507	N							1 U			1 U									
MW-52M	07/12/2007	MW-52M-071007	N							1 U			1 U									
MW-52M	08/08/2007	MW-52M-080707	N							1 U			1 U									
MW-52M	08/08/2007	MW-90-080707	FD							1 U			1 U									
MW-52M	09/05/2007	MW-52M_090407	N							1 U			1 U									
MW-52M	10/11/2007	MW-52M-101107	N							1 U			1 U									
MW-52M	05/07/2008	MW-52M-143	N							1 U			1.05 U									
MW-52S	03/13/2007	MW-52S-031307	N							1 U			1 U									
MW-52S	05/01/2007	MW-52S-050107	N							1 U			1 U									
MW-52S	06/05/2007	MW-52S_060507	N							1 U			1 U									
MW-52S	07/12/2007	MW-52S-071007	N							1 U			1 U									
MW-52S	08/08/2007	MW-52S-080707	N							1 U			1 U									
MW-52S	09/05/2007	MW-52S_090407	N							1 U			1 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-52S	10/11/2007	MW-52S-101107	N							1 U			1 U									
MW-52S	05/07/2008	MW-52S-143	N							1 U			1.05 U									
MW-53D	04/03/2007	MW-53D-033107	N							1 U			1 U									
MW-53D	05/02/2007	MW-53D-050107	N							1.41			1 U									
MW-53D	06/05/2007	MW-53D_060507	N							1 U			1 U									
MW-53D	06/05/2007	MW-90_060507	FD							1 U			1 U									
MW-53D	07/12/2007	MW-53D-071007	N							1 U			1 U									
MW-53D	08/08/2007	MW-53D-080707	N							1 U			1 U									
MW-53D	09/05/2007	MW-53D_090407	N							1 U			1 U									
MW-53D	09/05/2007	MW-90_090407	FD							1 U			1 U									
MW-53D	10/11/2007	MW-53D-101107	N							2.3 J			2 U									
MW-53D	10/11/2007	MW-90-101107	FD							1 UJ			1 U									
MW-53D	05/07/2008	MW-53D-143	N							1 U			1.05 U									
MW-53M	04/03/2007	MW-53M-033107	N							1 U			1 U									
MW-53M	05/01/2007	MW-53M-050107	N							1 U			1 U									
MW-53M	06/05/2007	MW-53M_060507	N							1 U			1 U									
MW-53M	07/12/2007	MW-53M-071007	N							1 U			1 U									
MW-53M	08/08/2007	MW-53M-080707	N							1 U			1 U									
MW-53M	09/05/2007	MW-53M_090407	N							1 U			1 U									
MW-53M	10/11/2007	MW-53M-101107	N							1 U			1 U									
MW-53M	05/07/2008	MW-53M-143	N							1 U			1.05 U									
MW-54-85	04/15/2008	MW-54-085-01	N							1 U			0.2 U									
MW-54-85	06/03/2008	MW-54-085-02-TLI	N							1 U			0.2 U									
MW-54-85	07/09/2008	MW-54-085-03	N							1 U			0.2 U									
MW-54-140	04/14/2008	MW-54-140-01	N							1 U			0.2 U									
MW-54-140	06/03/2008	MW-54-140-02-TLI	N							1 U			0.2 U									
MW-54-140	07/09/2008	MW-54-140-03	N							1 U			1 U									
MW-54-195	04/14/2008	MW-54-195-01	N							1 U			1 U									
MW-54-195	06/03/2008	MW-54-195-02-TLI	N							1 U			1 U									
MW-54-195	07/09/2008	MW-54-195-03	N							1 U			1 U									
MW-55-45	04/15/2008	MW-55-045-01	N							1 U			0.2 U									
MW-55-45	06/03/2008	MW-55-045-02-TLI	N							1 U			0.2 U									
MW-55-45	07/08/2008	MW-55-045-03	N							1 U			1 U									
MW-55-120	04/15/2008	MW-55-120-01	N							1 U			0.2 U									
MW-55-120	06/03/2008	MW-55-120-02-TLI	N							1 U			0.2 U									
MW-55-120	07/08/2008	MW-55-120-03	N							1 U			0.2 U									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
MW-56D	04/29/2008	MW-56D-01b	N							5 U			1 U									
MW-56D	06/04/2008	MW-56D-02-TLI	N							1 U			1 U									
MW-56D	07/09/2008	MW-56D-03	N							1 U			5 U									
MW-56M	04/29/2008	MW-56M-01b	N							1 U			0.2 U									
MW-56M	06/04/2008	MW-56M-02-TLI	N							1 U			0.2 U									
MW-56M	07/09/2008	MW-56M-03	N							1 U			1 U									
MW-56S	04/29/2008	MW-56S-01b	N							1 U			0.2 U									
MW-56S	06/04/2008	MW-56S-02-TLI	N							1 U			0.2 U									
MW-56S	07/09/2008	MW-56S-03	N							1 U			0.2 U									
MWP-12	11/05/2003	MWP-12-008	N							1 U			0.24									
OW-1D	09/30/2004	OW-1D	N	52 U	5 U	10 U	102	3 U	3.1 U	1 U	3 U	5 U	2 U	2.1 U	0.2 U	51.8	5 U	10 U	3.1 U	15 U	3 U	30.7
OW-1D	10/18/2004	OW-1D_101804	N							1 U												
OW-1D	11/18/2004	OW-1D-WQ3	N	52 U						1 U			1 U									
OW-1D	12/21/2004	OW-01D-049	N	52 U	5 U	10 U	113	3.1 U	3.1 U	4.8	3.1 U	5 U		2.1 U	0.2 U	35.6	5 U	10 U	3.1 U	15 U	10.7	36
OW-1D	12/21/2004	OW-01D-049	N							1 U												
OW-1D	05/10/2005	OW-1D-WQ6	N		2 U	4.77	91	1 U	1 U	1 U	1 U	2.52	1 U	1 U	0.5 U	43.4	1.05	1 U	1 U	1 U	1.69	10 U
OW-1D	07/27/2005	OW-01D-075	N	52 U	5 U	10 U	90.3	3 U	3 U	1.3 U	3 U	21.6	1 U	2.6 U	0.2 U	46.1	9.5	10 U	3 U	15 U	13.7	38.3
OW-1D	08/25/2005	OW-01D-077	N	52 U	5 U	10 U	52.2	3.1 U	3.1 U	1.6 U	3.1 U	16.5	1 U	3.1 U	0.2 U	26.6	5 U	10 U	3.1 U	15 U	17.2	15.6 U
OW-1D	09/14/2005	OW-01D-003	N	52 U	5 U	10 U	61.5	3 U	4.2 U	1.5	4.2 U	5 U	1 U	5 U	0.2 U	30.8	5 U	10 U	4.2 U	15 U	16	20.8 U
OW-1D	10/19/2005	OW-01D-004	N	52 U	3 U	5 U	300 U	2.1 U	2.1 U	1.1	5 U	10 U	1	2.1 U	0.2 U	26.2	20 U	5 U	5 U	2.1 U	122	20 U
OW-1D	11/14/2005	OW-01D-005	N	52 U	3 U	5 U	300 U	1 U	2 U	1.9	5 U	10 U	1.3	2 U	0.2 U	34.1	20 U	5 U	5 U	1 U	74.10001	20 U
OW-1D	12/05/2005	OW-01D-006	N	52 U	3 U	5 U	300 U	1 U	2 U	1.7	5 U	10 U	1.1 J	2 U	0.2 U	41.4	20 U	5 U	5 U	1 U	10.8	20 U
OW-1D	03/14/2006	OW-01D-007	N	52 U	3 U	5 U	300 U	1.1	2 U	1.1	5 U	10 U	1.3	2 U	0.2 U	16	20 U	5 U	5 U	1 U	27.7	20 U
OW-1D	06/06/2006	OW-01D-008	N	52 U	3 U	5 U	300 U	2.8	2 U	1 U	5 U	10 U	1 U	2 U	0.2 U	8.8	20 U	5 U	5 U	1 U	13.8	20 U
OW-1D	08/31/2006	OW-01D-009	N	52 U	3 U	5 U	300 U	1 U	2 U	1.2	5 U	10 U	0.84	2 U	0.2 U	15.8	20 U	5 U	5 U	1 U	6.8	20 U
OW-1D	10/12/2006	OW-01D-010	N	50 U	2 U	5 U	300 U	1 U	1 U	1.26	1 U	1.32 U	1	1 U	0.2 U	16.6	20 U	5 U	1 U	1 U	5.95	20 U
OW-1D	10/12/2006	OW-01D-010	N							1 U												
OW-1D	01/25/2007	OW-01D-011	N							1 U			1 U			17.6						
OW-1D	05/02/2007	OW-01D-012	N	50 U	2 U	2.36	33.5	1 U	1 U	1.75	1 U	1 U	1 U	1 U	0.2 U	14.1	1.36	2.15	1 U	1 U	4.96	10 U
OW-1D	08/09/2007	OW-01D-013	N							1.1			0.5			16.8						
OW-1D	10/16/2007	OW-01D-014	N	50 U	2 U	2.36	32.8	1 U	1 U	1.15	1 U	1 U	1	1 U	0.2 U	13	1 U	2.23	1 U	1 U	5.11	10 U
OW-1M	10/01/2004	OW-1M	N	52 U			59.7			7		5 U	7.5	2.1 U		26.8	5 U					46.1
OW-1M	11/18/2004	OW-1M-WQ3	N	52 U						11.8			8.3 J									
OW-1M	12/21/2004	OW-01M-049	N	52 U	5 U	10 U	58.1	3.1 U	3.1 U	10	3.1 U	5 U	9.7	2.1 U	0.2 U	26.8	5 U	10 U	3.1 U	15 U	14.7	20.9
OW-1M	12/21/2004	OW-01M-049	N1							8.8												
OW-1M	05/10/2005	OW-1M-WQ6	N		2 U	2.69	51.6	1 U	1 U	13.8	1 U	2.41	14.5	1 U	0.5 U	23.5	4.68	1 U	1 U	1 U	5.45	13.1

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
OW-1M	05/10/2005	OW-1M-WQ6	N							15.7												
OW-1M	07/27/2005	OW-01M-075	N	52 U	5 U	10 U	57.9	3 U	3 U	18.9	3 U	5 U	16.3	2.6 U	0.2 U	27	5 U	10 U	3 U	15 U	14.7	13 U
OW-1M	08/25/2005	OW-01M-077	N	52 U	5 U	10 U	21.8	3.1 U	3.1 U	10.7	3.1 U	21	11.4	3.1 U	0.2 U	12.2	5 U	10 U	3.1 U	15 U	12.2	15.6 U
OW-1M	09/14/2005	MW-90-003	FD	52 U	5 U	10 U	50.4	3 U	3 U	7.5	3 U	5 U	8.1	5 U	0.2 U	16.2	5 U	10 U	3 U	15 U	13.3	20 U
OW-1M	09/14/2005	OW-01M-003	N	52 U	5 U	10 U	52.7	3 U	3 U	7.3	3 U	5 U	8.1	5 U	0.2 U	17.4	5 U	10 U	3 U	15 U	12.5	20 U
OW-1M	10/19/2005	OW-01M-004	N	52 U	3 U	5 U	300 U	2.1 U	2.1 U	3.5	5 U	10 U	4	4.9	0.2 U	14.7	20 U	5.2	5 U	2.1 U	52.1	20 U
OW-1M	11/14/2005	OW-01M-005	N	52 U	3 U	5 U	300 U	1 U	2 U	3.6	5 U	10 U	3.2	2 U	0.2 U	13.6	20 U	5 U	5 U	1 U	62.5	20 U
OW-1M	12/05/2005	OW-01M-006	N	52 U	3 U	5 U	300 U	1 U	2 U	3.4	5 U	10 U	3	2 U	0.2 U	12.6	20 U	5 U	5 U	1 U	5.4	20 U
OW-1M	03/14/2006	OW-01M-007	N	52 U	3 U	5 U	300 U	1.2	2 U	1 U	5 U	10 U	1.6	2 U	0.2 U	8.1	20 U	5 U	5 U	1 U	19.3	20 U
OW-1M	06/06/2006	OW-01M-008	N	52 U	3 U	5 U	300 U	2.5	2 U	2	5 U	10 U	1.4	2 U	0.2 U	7.5	20 U	5 U	5 U	1 U	12.1	20 U
OW-1M	08/31/2006	OW-01M-009	N	52 U	3 U	5 U	300 U	1 U	2 U	2.6	5 U	10 U	1.3	2 U	0.2 U	11.5	20 U	5 U	5 U	1 U	5 U	20 U
OW-1M	10/10/2006	OW-01M-010	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	0.81	2 U	0.2 U	5 U	20 U	5 U	5 U	2.1 U	5 U	20 U
OW-1M	01/25/2007	OW-01M-011	N							1.5			1 U			10.8						
OW-1M	05/01/2007	OW-01M-012	N	111	2 U	1.22	67.8	1 U	1 U	1.31	1 U	1 U	0.75	1 U	0.2 U	8.83	1 U	1.78	1 U	1 U	1.84	24.5
OW-1M	08/09/2007	OW-01M-013	N							1 U			0.57			18.4						
OW-1M	10/16/2007	OW-01M-014	N	50 U	2 U	1.41	96.2	1 U	1 U	1 U	1 U	1 U	1.1	1 U	0.2 U	11.1	1 U	2.54	1 U	1 U	3.09	10 U
OW-1S	12/21/2004	OW-01S-049	N	52 U	5 U	10 U	66.2	3.1 U	3.1 U	3.4	3.1 U	5 U	4.9	2.1 U	0.2 U	27.3	8.7	10 U	3.1 U	15 U	12.1	26.4
OW-1S	12/21/2004	OW-01S-049	N							1.6												
OW-1S	07/28/2005	MW-90-075	FD	52 U	5 U	10 U	60.7	3 U	3 U	23.5 J	3 U	5 U	19.4	2.4 U	0.2 U	17.2	7.5	10 U	3 U	15 U	10.6	12.2 U
OW-1S	07/28/2005	OW-01S-075	N	52 U	5 U	10 U	59.2	3 U	3 U	18.8 J	3 U	5 U	18.7	2.1 U	0.2 U	15.7	7.1	10 U	3 U	15 U	5	10.4 U
OW-1S	08/26/2005	OW-01S-077	N	52 U	5 U	10 U	67.5	3.1 U	3.1 U	18	3.1 U	5 U	19.1	3.1 U	0.2 U	11.6	10.3	10 U	3.1 U	15 U	6.8	15.6 U
OW-1S	09/15/2005	OW-01S-003	N	52 U	5 U	10 U	66.60001	3 U	3 U	16.8	3 U	5 U	19.2	4.7	0.2 U	9.6	6.4	10 U	3 U	15 U	13	20 U
OW-1S	10/20/2005	OW-01S-004	N	52 U	3 U	5 U	300 U	2.1 U	2.1 U	14.5	5 U	10 U	17.7	2.1 U	0.2 U	14	20 U	5.9	5 U	2.1 U	56.4	20 U
OW-1S	11/16/2005	OW-01S-005	N	118	3 U	5 U	300 U	1 U	2 U	18.1	5 U	10 U	19.4	2.6	0.2 U	9.4	20 U	5 U	5 U	1 U	27.9	20 U
OW-1S	12/05/2005	MW-90-006	FD	52 U	3 U	5 U	300 U	1 U	2 U	19.2	5 U	10 U	20.8	2 U	0.2 U	11.1	20 U	5 U	5 U	1 U	5 U	20 U
OW-1S	12/05/2005	OW-01S-006	N	52 U	3 U	5 U	300 U	1 U	2 U	19.2	5 U	10 U	20.8	2 U	0.2 U	11.9	20 U	5 U	5 U	1 U	5 U	20 U
OW-1S	03/15/2006	OW-01S-007	N	52 U	3 U	5 U	300 U	1 U	2 U	16.9	5 U	10 U	18.8	2 U	0.2 U	5.5	20 U	5 U	5 U	1 U	6.4	20 U
OW-1S	06/06/2006	OW-01S-008	N	52 U	3 U	5 U	300 U	1 U	2 U	16.5	5 U	10 U	18.6	2 U	0.2 U	6.6	20 U	5 U	5 U	1 U	6.2	20 U
OW-1S	08/31/2006	OW-01S-009	N	52 U	3 U	5 U	300 U	1 U	2 U	23	5 U	10 U	20.5	2 U	0.2 U	14.9	20 U	5 U	5 U	1 U	5 U	20 U
OW-1S	10/10/2006	OW-01S-010	N	52 U	3 U	5 U	300 U	1 U	2 U	16.2	5 U	10 U	19.9	2 U	0.2 U	5 U	20 U	5 U	5 U	2.1 U	5 U	20 U
OW-1S	01/24/2007	OW-01S-011	N							18.8			20.1			9						
OW-1S	05/01/2007	OW-01S-012	N	50 U	2 U	1.14	82.9	1 U	1 U	20	1 U	1 U	18	1 U	0.2 U	8.45	3.51	1.9	1 U	1 U	2.44	10 U
OW-1S	08/09/2007	OW-01S-013	N							19.4			19.8			13.5						
OW-1S	10/16/2007	OW-01S-014	N	50 U	2 U	1.32	78.2	1 U	1 U	19.7	1 U	1 U	21.6	1 U	0.2 U	10.6	1.73	1.91	1 U	1 U	3.66	10 U
OW-2D	01/13/2005	OW-2D-WQ5	N	52 U	5 U	10 U	83.3	3.1 U	3.1 U	1 U	3.1 U	5 U	1 U	2.9	0.2 U	66.5	13.5	17.1	8.5	15 U	17.7	17.4
OW-2D	05/10/2005	OW-2D-WQ6	N		2 U	3.3	71.6	1 U	1 U	1 U	1 U	3.11	1 U	1 U	0.5 U	57	1 U	1 U	1 U	1 U	1 U	10 U

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
OW-2D	07/28/2005	OW-02D-075	N	52 U	5 U	10 U	54.6	3 U	3 U	1.2 U	3 U	5 U	1 U	2.4 U	0.2 U	51.2	6.7	10 U	3 U	15 U	17.2	12.2 U
OW-2D	08/25/2005	OW-02D-077	N	52 U	5 U	10 U	21.1	3.1 U	3.1 U	1.9	3.1 U	18.6	0.61	3.1 U	0.2 U	14.3	5 U	10 U	3.1 U	15 U	15.2	15.6 U
OW-2D	09/14/2005	OW-02D-003	N	52 U	5 U	10 U	19.9	3 U	3 U	1 U	3 U	6.3	0.47	5 U	0.2 U	11.3	5 U	10 U	3 U	15 U	17	20 U
OW-2D	10/20/2005	OW-02D-004	N	52 U	3 U	5 U	300 U	2.1 U	2.1 U	1 U	5 U	10 U	0.26	2.4	0.2 U	8.8	20 U	5 U	5 U	2.1 U	86.2	20 U
OW-2D	11/14/2005	OW-02D-005	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	1 U	2 U	0.2 U	10.7	20 U	5.6	5 U	1 U	52	20 U
OW-2D	12/05/2005	OW-02D-006	N	52 U	3 U	5 U	300 U	1 U	2 U	1.5	5 U	10 U	1 U	2 U	0.2 U	9.8	20 U	6.5	5 U	1 U	5 U	20 U
OW-2D	03/14/2006	OW-02D-007	N	52 U	3 U	5 U	300 U	1.3	2 U	1 U	5 U	10 U	1 U	2 U	0.2 U	8.2	20 U	5 U	5 U	1 U	12.6	20 U
OW-2D	06/07/2006	OW-02D-008	N	52 U	3 U	5 U	300 U	2.3	2 U	1 U	5 U	10 U	1 U	2 U	0.2 U	8.2	20 U	5 U	5 U	1 U	11.8	20 U
OW-2D	08/31/2006	OW-02D-009	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	0.49	2 U	0.2 U	14.4	20 U	5 U	5 U	1 U	5 U	20 U
OW-2D	10/10/2006	OW-02D-010	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	0.24	2 U	0.2 U	12.4	20 U	5 U	5 U	2.1 U	5 U	20 U
OW-2D	01/24/2007	OW-02D-011	N							1 U			0.2 U			12.1						
OW-2D	04/30/2007	OW-02D-012	N	50 U	2 U	2	19.7	10 U	1 U	1 U	1 U	1.03	0.29	1 U	0.2 U	13	1.02	2.08	1 U	1 U	1.48	10 U
OW-2D	08/09/2007	OW-02D-013	N							1 U			0.6			15.9						
OW-2D	10/17/2007	OW-02D-014	N	50 U	2 U	2.21	22.1	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	14.3	1 U	2.54	1 U	1 U	1.81	10 U
OW-2M	01/27/2005	OW-2M-WQ5	N							8.9			2.3									
OW-2M	05/11/2005	OW-2M-WQ6	N		2 U	1.65	60.3	1 U	1 U	5.85	1 U	1 U	4.9	1 U	0.5 U	35.3	1 U	1 U	1 U	1 U	2.96	11.3
OW-2M	05/11/2005	OW-2M-WQ6	N							4												
OW-2M	07/28/2005	OW-02M-075	N	52 U	5 U	10 U	52.7	3 U	3 U	5.7	3 U	5 U	5.4	2.4 U	0.2 U	32.4	5 U	10 U	3 U	15 U	14.4	12.2 U
OW-2M	08/25/2005	OW-02M-077	N	52 U	5 U	10 U	47.4	3.1 U	3.1 U	6.6	3.1 U	20.6	4.7	3.1 U	0.2 U	22.9	5 U	10 U	3.1 U	15 U	11.4	27.1
OW-2M	09/14/2005	OW-02M-003	N	52 U	5 U	10 U	44.9	3 U	3 U	3.9	3 U	5 U	3.8	5 U	0.2 U	21.5	5 U	10 U	3 U	15 U	12.4	20 U
OW-2M	10/20/2005	OW-02M-004	N	52 U	3 U	5 U	300 U	2.1 U	2.1 U	2.1	5 U	10 U	2.3	3.2	0.2 U	15	20 U	5 U	5 U	2.1 U	91.3	20 U
OW-2M	11/15/2005	MW-90-005	FD	52 U	3 U	5 U	300 U	1 U	2 U	4.9	5 U	10 U	4.1	2 U	0.2 U	15.7	20 U	5 U	5 U	1 U	51.8	20 U
OW-2M	11/15/2005	OW-02M-005	N	52 U	3 U	5 U	300 U	1 U	2 U	5	5 U	10 U	4.1	2 U	0.2 U	17	20 U	5 U	5 U	1 U	51.8	20 U
OW-2M	12/06/2005	OW-02M-006	N	52 U	3 U	5 U	300 U	1 U	2 U	2.8	5 U	10 U	3	2 U	0.2 U	13.6	20 U	6.5	5 U	1 U	6.9	38.8
OW-2M	03/14/2006	OW-02M-007	N	52 U	3 U	5 U	300 U	1.1	2 U	6.5	5 U	10 U	7.7	2 U	0.2 U	8.1	20 U	5 U	5 U	1 U	15.8	20 U
OW-2M	06/07/2006	OW-02M-008	N	52 U	3 U	5 U	300 U	2.3	2 U	1.2	5 U	10 U	1.2	2 U	0.2 U	8.8	20 U	5 U	5 U	1 U	11	20 U
OW-2M	08/30/2006	OW-02M-009	N	52 U	3 U	5 U	300 U	1 U	2 U	1.2	5 U	10 U	0.97	2 U	0.2 U	13	20 U	5 U	5 U	1 U	5 U	20 U
OW-2M	10/10/2006	MW-91-010	FD	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	1.4	2 U	0.2 U	11.5	20 U	5 U	5 U	2.1 U	5 U	20 U
OW-2M	10/10/2006	OW-02M-010	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	1.4	2 U	0.2 U	13.5	20 U	5 U	5 U	2.1 U	5 U	20 U
OW-2M	01/24/2007	OW-02M-011	N							2.9			2.4			11.7						
OW-2M	04/30/2007	OW-02M-012	N	50 U	2 U	1.08	62.2	10 U	1 U	2.5	1 U	1 U	1.5	1 U	0.2 U	11.4	1.53	2.26	1 U	1 U	2.1	10 U
OW-2M	08/09/2007	OW-02M-013	N							1 U			0.76			15						
OW-2M	10/16/2007	OW-02M-014	N	50 U	2 U	1 U	67.2	1 U	1 U	1.11	1 U	1 U	1.2	1 U	0.2 U	11.8	1 U	2.42	1 U	1 U	2.38	10 U
OW-2S	12/29/2004	OW-2S-WQ5	N	52 U	5 U	10 U	31.9	3.1 U	3.1 U	3.4	3.1 U	5 U	0.2 U	2.1 U	0.2 U	89.3	5 U	10 U	3.1 U	15 U	7	33.3
OW-2S	12/29/2004	OW-2S-WQ5	N							2.1												
OW-2S	07/28/2005	OW-02S-075	N	52 U	5 U	10 U	53.7	3 U	3 U	14.8	3 U	5 U	15.3	2.4 U	0.2 U	35.6	5 U	10 U	3 U	15 U	10.8	12.2 U

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
OW-2S	08/26/2005	OW-02S-077	N	52 U	5 U	10 U	60.6	3.1 U	3.1 U	19.1	3.1 U	5 U	18.9	3.1 U	0.2 U	35.6	5 U	10 U	3.1 U	15 U	8.5	15.6 U
OW-2S	08/26/2005	OW-90-077	FD	52 U	5 U	10 U	59.8	3.1 U	3.1 U	18.9	3.1 U	5 U	17	3.1 U	0.2 U	38.3	5 U	10 U	3.1 U	15 U	9.2	15.6 U
OW-2S	09/14/2005	OW-02S-003	N	52 U	5 U	10 U	62.5	3 U	3 U	22.4	3 U	5 U	23.7	5 U	0.2 U	32.3	5 U	10 U	3 U	15 U	10.7	20 U
OW-2S	10/20/2005	OW-02S-004	N	52 U	3 U	5 U	300 U	2.1 U	2.1 U	25.4	5 U	10 U	25.8	2.1 U	0.2 U	29	20 U	5 U	5 U	2.1 U	38.2	20 U
OW-2S	11/15/2005	OW-02S-005	N	52 U	3 U	5 U	300 U	1 U	2 U	38.8	5 U	10 U	34.4	2 U	0.2 U	37.6	20 U	6.8	5 U	1 U	23.5	20 U
OW-2S	12/06/2005	OW-02S-006	N	56.7	3 U	5 U	300 U	1 U	2 U	31.8	5 U	10 U	32	2 U	0.2 U	34	20 U	5 U	5 U	1 U	5.8	20 U
OW-2S	03/15/2006	MW-90-CMP-007	FD	52 U	3 U	5 U	300 U	1 U	2 U	39.2	5 U	10 U	36.4	2 U	0.2 U	28.6	20 U	5 U	5 U	1 U	6.9	20 U
OW-2S	03/15/2006	OW-02S-007	N	52 U	3 U	5 U	300 U	1 U	2 U	39.4	5 U	10 U	36.5	2 U	0.2 U	31.3	20 U	5 U	5 U	1 U	6.7	20 U
OW-2S	06/06/2006	MW-90-008a	FD	52 U	3 U	5 U	300 U	1.8	2 U	44.5	5 U	10 U	34.9	2 U	0.2 U	27.2	20 U	6.2	5 U	1 U	7.5	20 U
OW-2S	06/06/2006	OW-02S-008	N	52 U	3 U	5 U	300 U	1.6	2 U	40.9	5 U	10 U	35.3	2 U	0.2 U	31.9	20 U	5.8	5 U	1 U	7.9	20 U
OW-2S	09/08/2006	MW-90-009	FD	66.5	3 U	5 U	300 U	1 U	2 U	38.9	5 U	10 U	38.2	2 U	0.2 U	44.8	20 U	5 U	5 U	1 U	6.2	20 U
OW-2S	09/08/2006	OW-02S-009	N	52 U	3 U	5 U	300 U	1 U	2 U	35.4	5 U	10 U	40.4	2 U	0.2 U	46.2	20 U	5 U	5 U	1 U	6.7	20 U
OW-2S	10/10/2006	MW-90-010a	FD	52 U	3 U	5 U	300 U	1 U	2 U	34.2	5 U	10 U	34.8	2 U	0.2 U	43.2	20 U	5 U	5 U	1 U	6.7	20 U
OW-2S	10/10/2006	OW-02S-010	N	152	3 U	5 U	300 U	1 U	2 U	36.2	5 U	10 U	34.2	2 U	0.2 U	45.3	20 U	5 U	5 U	1 U	6.3	20 U
OW-2S	11/21/2006	OW-02S-010C	N							40			38									
OW-2S	01/24/2007	MW-90-CMP-011	FD							38.4			37.1			40.7						
OW-2S	01/24/2007	OW-02S-011	N							38.8			37.2			42.5						
OW-2S	04/30/2007	CIS-011	N	50 U	2 U	2.45	50.3	10 U	1 U	37.4	1 U	1 U	35	1 U	0.2 U	40	1.73	2.77	1 U	1 U	5.8	10 U
OW-2S	08/09/2007	MW-90-CMP-013	FD							31.4			33.6			47.6						
OW-2S	08/09/2007	OW-02S-013	N							32.3			35.1			40.3						
OW-2S	10/17/2007	OW-02S-014	N	50 U	2 U	2.39	45.1	1 U	1 U	33.6	1 U	1 U	34.1	1 U	0.2 U	40.7	1 U	2.66	1 U	1 U	5.86	10 U
OW-3D	10/28/2004	OW-3D-WQ2	N	52 U			40.7			1 U		5 U	0.2 U	2.1 U		43.7	5 U					28.8
OW-3D	11/16/2004	OW-3D-WQ3	N	52 U						1 U			0.2 U									
OW-3D	12/14/2004	OW-3D-WQ4	N	52 U	5 U	10 U	63.4	3.1 U	3.1 U	1 U	3.1 U	5 U	0.2 U	2.4	0.2 U	31	5 U	10 U	3.1 U	15 U	8.4	71.2
OW-3D	10/06/2005	OW-03D-081	N							1 U			0.3									
OW-3D	03/09/2006	OW-03D-093	N							2.2			2.5									
OW-3D	10/06/2006	OW-03D-110	N							3.6			2.7									
OW-3D	03/09/2007	OW-03D-121	N							3			3.1									
OW-3D	10/03/2007	OW-03D-136	N							4.2			3.9									
OW-3M	10/28/2004	MW-90-WQ2	FD	52 U			56			9.4		5 U	10.3	2.1 U		20.5	5 U					10.4 U
OW-3M	10/28/2004	OW-3M-WQ2	N	52 U			55.5			11.2		5 U	10.4	2.1 U		20.6	5 U					10.4 U
OW-3M	11/16/2004	OW-3M-WQ3	N	52 U						12.5			12.6									
OW-3M	12/15/2004	OW-3M-WQ4	N		5 U	10 U	73.4	3.1 U	3.1 U	13.8	3.1 U	5 U	15.7	2.1 U	0.2 U	14.5	5 U	10 U	3.1 U	15 U	9.5	30.3
OW-3M	12/15/2004	OW-3M-WQ4	N							12.9												
OW-3M	10/06/2005	OW-03M-081	N							14.3			16.7									
OW-3M	03/09/2006	OW-03M-093	N							15.7			17									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
OW-3M	05/04/2006	OW-03M-CIS	N	50 U	2 U	2.71	89	1 U	1 U	20	1 U	1.12	18	1 U	0.2 U	16.1	1 U	1.03	1 U	1 U	5	10 U
OW-3M	10/12/2006	MW-98-110	FD							15.3 J			17.9									
OW-3M	10/12/2006	OW-03M-110	N							20 J			17.8									
OW-3M	03/09/2007	OW-03M-121	N							17			18.3									
OW-3M	05/01/2007	CIS-023	N			2.34	85.8			18.2		1 U	17.8	1 U		15.2	1 U	1 U			3.06	10 U
OW-3M	10/03/2007	OW-03M-136	N							18.5			16.5 J									
OW-3S	10/28/2004	OW-3S-WQ2	N	52 U			20.6			12.1		5 U	13.5	4.6		23.9	5 U					20.4
OW-3S	11/16/2004	OW-3S-WQ3	N	52 U						16.8			17.7									
OW-3S	12/15/2004	OW-3S-WQ4	N		5 U	10 U	16.7	3.1 U	3.1 U	16.4	3.1 U	5 U	17.7	2.1 U	0.2 U	22.2	5 U	10 U	3.1 U	15 U	8.7	30.9
OW-3S	12/15/2004	OW-3S-WQ4	N							15.1 J												
OW-3S	12/22/2004	OW-03S-081	N							16.6			19.3									
OW-3S	12/22/2004	OW-03S-093	N							18.2			21.2									
OW-3S	10/12/2006	OW-03S-110	N							20.7			22.1									
OW-3S	03/09/2007	OW-03S-121	N							22.1			22.8									
OW-3S	04/30/2007	CIS-014	N			1 U	162			23.4		1 U	20	1 U		4.43	6.01	2.26			1.55	10 U
OW-3S	10/03/2007	OW-03S-136	N							21.8			22.3									
OW-5D	12/22/2004	MW-96-049	FD	52 U	5 U	10 U	84.4	3.1 U	3.1 U	1.2	3.1 U	5 U	0.2 UJ	2.1 U	0.2 U	83.8	9.3	10 U	3.1 U	15 U	11.6	28.9
OW-5D	12/22/2004	MW-96-049	FD							1 U												
OW-5D	12/22/2004	OW-5D-049	N	52 U	5 U	10 U	78.4	3.1 U	3.1 U	1.3	3.1 U	5 U	0.2 UJ	2.1 U	0.2 U	81.1	8.1	10 U	3.1 U	15 U	13.3	24.3
OW-5D	12/22/2004	OW-5D-049	N							1 U												
OW-5D	05/11/2005	OW-5D-WQ6	N		2 U	4.41	65.8	1 U	1 U	1 U	1 U	4.09	1 U	1 U	0.5 U	63.8	1 U	1 U	1 U	1 U	1 U	10 U
OW-5D	07/28/2005	OW-05D-075	N	52 U	5 U	10 U	61.6	3 U	3 U	1.2 U	3 U	5 U	1 U	2.4 U	0.2 U	57	5.4	10 U	3 U	15 U	10.2	12.2 U
OW-5D	08/26/2005	OW-05D-077	N	202	5 U	10 U	45.8	3.1 U	3.1 U	3.9	3.1 U	5 U	1 U	3.1 U	0.2 U	48.8	9.7	10 U	3.1 U	15 U	11.2	36.7
OW-5D	09/13/2005	OW-05D-003	N	52 U	5 U	10 U	53.8	3 U	4.2 U	1 U	4.2 U	15	1 U	5 U	0.2 U	42.5	6.5	10 U	4.2 U	15 U	14.4	22.7
OW-5D	10/19/2005	OW-05D-004	N	52 U	3 U	5 U	300 U	2.1 U	2.1 U	1.1	5 U	10 U	1.5	3.7	0.2 U	46.4	20 U	5 U	5 U	2.1 U	96.6	20 U
OW-5D	11/15/2005	OW-05D-005	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	1 U	2 U	0.2 U	50.9	20 U	5 U	5 U	1 U	85.3	30
OW-5D	12/06/2005	OW-05D-006	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	1 U	2 U	0.2 U	45	20 U	5 U	5 U	1 U	9.7	33.3
OW-5D	03/15/2006	OW-05D-007	N	52 U	3 U	5 U	300 U	1.4	2 U	1.4	5 U	10 U	1.1	2 U	0.2 U	20.7	20 U	5 U	5 U	1 U	13.7	20 U
OW-5D	06/07/2006	OW-05D-008	N	520 U	3 U	5 U	300 U	2.5	2 U	1 U	5 U	10 U	1 U	2 U	0.2 U	11.8	20 U	5 U	5 U	1 U	13	20 U
OW-5D	08/30/2006	OW-05D-009	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	0.2 U	2 U	0.2 U	13	20 U	5 U	5 U	1 U	5.1	20 U
OW-5D	10/11/2006	OW-05D-010	N	52 U	3 U	5 U	300 U	1 U	2 U	1 U	5 U	10 U	0.2 U	2 U	0.2 U	12.6	20 U	5 U	5 U	2.1 U	5 U	20 U
OW-5D	01/25/2007	OW-05D-011	N							1 U			0.2 U			14						
OW-5D	05/01/2007	OW-05D-012	N	50 U	2 U	1.24	18.8	1 U	1 U	1 U	1 U	3.04	0.2 U	1 U	0.2 U	14.7	3	2.25	1 U	1 U	1 U	10 U
OW-5D	08/09/2007	OW-05D-013	N							1 U			0.2 U			18.3						
OW-5D	10/17/2007	OW-05D-014	N	138	2 U	1.33	24.6	1 U	1 U	1.38	1 U	2.94	0.2 U	1 U	0.2 U	14.9	1	2.46	1 U	1 U	1.66	10 U
OW-5M	01/13/2005	OW-5M-WQ5	N	52 U	11.1	14.4	60.1	8.8	10.5	6.2	10	10.6	8	10.2	0.2 U	50.1	20.1	18.6	20	15 U	22.9	37.3

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
OW-5M	01/13/2005	OW-5M-WQ5	N							8.4												
OW-5M	05/11/2005	OW-5M-WQ6	N		2 U	1.7	51.1	1 U	1 U	7.4	1 U	1.6	8.9	1 U	0.5 U	39	1.28	1 U	1 U	1 U	2.61	10 U
OW-5M	05/11/2005	OW-5M-WQ6	N							10.3												
OW-5M	07/28/2005	OW-05M-075	N	52 U	5 U	10 U	47.6	3 U	3 U	8.8	3 U	5 U	8.6 J	2.4 U	0.2 U	35.4	5 U	10 U	3 U	15 U	9.7	12.2 U
OW-5M	08/26/2005	OW-05M-077	N	52 U	5 U	10 U	45.8	3.1 U	3.1 U	11.3	3.1 U	5.8	12.8	3.1 U	0.2 U	32.1	5 U	10 U	3.1 U	15 U	9.7	15.6 U
OW-5M	09/13/2005	OW-05M-003	N	52 U	5 U	10 U	42	3 U	4.2 U	10.6	4.2 U	11.4	11.3	5 U	0.2 U	28.6	5.4	10 U	4.2 U	15 U	13.4	26.4
OW-5M	10/20/2005	MW-90-004	FD	52 U	3 U	5 U	300 U	2.1 U	2.1 U	10.3	5 U	10 U	11.7	2.1 U	0.2 U	23.8	20 U	5 U	5 U	2.1 U	118	20 U
OW-5M	10/20/2005	OW-05M-004	N	52 U	3 U	5 U	300 U	2.1 U	2.1 U	10.4	5 U	10 U	11.7	2.1 U	0.2 U	26	20 U	5 U	5 U	2.1 U	122	20 U
OW-5M	11/15/2005	OW-05M-005	N	52 U	3 U	5 U	300 U	1 U	2 U	10.2	5 U	10 U	11.6	2 U	0.2 U	24.9	20 U	5 U	5 U	1 U	70.60001	25
OW-5M	12/06/2005	OW-05M-006	N	52 U	3 U	5 U	300 U	1 U	2 U	11	5 U	10 U	9	2 U	0.2 U	24.5	20 U	5 U	5 U	1 U	6.4	23.8
OW-5M	03/15/2006	OW-05M-007	N	52 U	3 U	5 U	300 U	1 U	2 U	10.1	5 U	10 U	12.8	2 U	0.2 U	20.1	20 U	5 U	5 U	1 U	13.9	20 U
OW-5M	06/07/2006	OW-05M-008	N	52 U	3 U	5 U	300 U	2.3	2 U	8.6	5 U	10 U	9.8	2 U	0.2 U	19.5	20 U	5 U	5 U	1 U	12.4	20 U
OW-5M	08/30/2006	OW-05M-009	N	52 U	3 U	5 U	300 U	1 U	2 U	6.5	5 U	10 U	5.1	2 U	0.2 U	44.7	20 U	5 U	5 U	1 U	5 U	20 U
OW-5M	10/11/2006	OW-05M-010	N	52 U	3 U	5 U	300 U	1 U	2 U	2	5 U	10 U	2	2 U	0.2 U	27.1	20 U	5 U	5 U	2.1 U	5 U	20 U
OW-5M	01/25/2007	OW-05M-011	N							1.5			0.2 U			17.9						
OW-5M	04/30/2007	CW-90-012	FD	50 U	2 U	1.17	38.1	10 U	1 U	1.25	1 U	1 U	0.36	1 U	0.2 U	12.9	2.31	2.36	1 U	1 U	1.81	10 U
OW-5M	04/30/2007	OW-05M-012	N	50 U	2 U	1.15	37.9	10 U	1 U	1 U	1 U	1 U	0.35	1 U	0.2 U	12.7	2.12	2.26	1 U	1 U	1.8	10 U
OW-5M	08/08/2007	OW-05M-013	N							3			2.5			9.8						
OW-5M	10/17/2007	MW-90-014	FD	50 UJ	2 U	1.01	40.3	1 U	1 U	1 U	1 U	3.16	1 U	1 U	0.2 U	12.2	1 U	2.35	1 U	1 U	1.65	10 UJ
OW-5M	10/17/2007	OW-05M-014	N	749 J	2 U	1.05	41.1	1 U	1 U	1 U	1 U	3.31	1 U	1 U	0.2 U	12.2	1 U	2.37	1 U	1 U	1.85	278 J
OW-5S	12/21/2004	OW-05S-049	N	52 U	5 U	10 U	51.3	3.1 U	3.1 U	29.5	3.1 U	5 U	32.6	2.1 U	0.2 U	21.3	5 U	10 U	64.9	15 U	12.9	25.6
OW-5S	12/21/2004	OW-05S-049	N							26.6												
OW-5S	05/11/2005	OW-5S-WQ6	N		2 U	1.95	53	1 U	1 U	26.4	1.07	1.55	22.3	1 U	0.5 U	19	4.14	2.82	1 U	1 U	5.5	16.6
OW-5S	05/11/2005	OW-5S-WQ6	N							24.3												
OW-5S	05/11/2005	OW-91-WQ6	FD		2 U	2.22	64.4	1 U	1 U	25.6	1.25	2.26	19.8	1 U	0.5 U	19.4	4.9	2.82	1 U	1 U	5.43	14.5
OW-5S	05/11/2005	OW-91-WQ6	FD							23.4												
OW-5S	07/28/2005	OW-05S-075	N	52 U	5 U	10 U	48.9	3 U	3 U	25.6	3 U	5 U	23.4	2.4 U	0.2 U	17.1	5 U	10 U	3 U	15 U	11.4	12.2 U
OW-5S	08/26/2005	OW-05S-077	N	52 U	5 U	10 U	54	3.1 U	3.1 U	25.1	3.1 U	5 U	24.4	3.1 U	0.2 U	17.8	5 U	10 U	3.1 U	15 U	7.9	15.6 U
OW-5S	09/13/2005	OW-05S-003	N	52 U	5 U	10 U	48.3	3 U	3 U	21.8	3 U	15	23.5	5 U	0.2 U	15.7	5 U	10 U	3 U	15 U	7.9	20 U
OW-5S	10/20/2005	OW-05S-004	N	52 U	3 U	5 U	300 U	2.1 U	2.1 U	29.2	5 U	10 U	25.5	2.8	0.2 U	16.8	20 U	5 U	5 U	2.1 U	41.5	20 U
OW-5S	11/15/2005	OW-05S-005	N	52 U	3 U	5 U	300 U	1 U	2 U	23.2	5 U	10 U	22.5	2 U	0.2 U	15.1	20 U	5 U	5 U	1 U	25.4	20 U
OW-5S	12/06/2005	OW-05S-006	N	52 U	3 U	5 U	300 U	1 U	2 U	25.7	5 U	10 U	25.2 J	2 U	0.2 U	17.6	20 U	5 U	5 U	1 U	5.2	20 U
OW-5S	03/15/2006	OW-05S-007	N	52 U	3 U	5 U	300 U	1 U	2 U	26.7	5 U	10 U	25.3	2 U	0.2 U	14.2	20 U	5 U	5 U	1 U	5 U	20 U
OW-5S	06/07/2006	OW-05S-008	N	52 U	3 U	5 U	300 U	1 U	2 U	24.4	5 U	10 U	25.4	2 U	0.2 U	15.3	20 U	5 U	5 U	1 U	5.9	20 U
OW-5S	08/31/2006	OW-05S-009	N	99.1	3 U	5 U	300 U	1 U	2 U	30.4	5 U	10 U	28.4	2 U	0.2 U	25.2	20 U	5 U	5 U	1 U	5.2	20 U
OW-5S	10/10/2006	OW-05S-010	N	52 U	3 U	5 U	300 U	1 U	2 U	22.1	5 U	10 U	25.4	2 U	0.2 U	25.3	20 U	5 U	5 U	1 U	5.3	20 U

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
OW-5S	01/25/2007	OW-05S-011	N							28.5			27.8			29.4						
OW-5S	04/30/2007	CIS-018	N	50 U	2 U	1.33	59.4	10 U	1 U	25.6	1 U	1.14	24.1	1 U	0.2 U	22.6	3	2.69	1 U	1 U	3.7	10 U
OW-5S	08/09/2007	OW-05S-013	N							25.3			26.5			26.5						
OW-5S	10/17/2007	OW-05S-014	N	50 U	2 U	1.54	54.3	1 U	1 U	25.6	1 U	2.3	26.3	1 U	0.2 U	26.2	5.29	2.94	1 U	1 U	4.68	10 U
Park Moabi-4	05/02/2007	PM4-125	N		2 U	1 U	112	1 U	1 U		1 U	1.96	0.2 U	1 U	0.2 U	6.02	6.3	1.45	1 U	1 U	1.57	605 J
Park Moabi-4	10/04/2007	PM-04-136	N										21.4									
PE-1	03/05/2005	PE-1-3505	N							293												
PE-1	03/21/2005	PE-1-058	N				500 U			1 U			1 U									
PE-1	10/03/2005	PE-01-081	N				300 U			1 U			1 U									
PE-1	12/13/2005	PE-01-087	N							1 U			1 U									
PE-1	02/08/2006	PE-01-091	N							136			136									
PE-1	03/08/2006	PE-01-093	N							125			136									
PE-1	03/17/2006	PE-01_031706	N			5 U				138			148									
PE-1	04/05/2006	PE-01_040506	N	5 U						136			140									
PE-1	04/06/2006	PE-01-095	N							117			133									
PE-1	05/11/2006	PE-01-098	N							109			118									
PE-1	06/15/2006	PE-01-102	N							87.3			101									
PE-1	07/12/2006	PE-01-104	N							72.4			95.9									
PE-1	08/09/2006	PE-01-106	N							83.4			95.9									
PE-1	09/07/2006	PE-01-108	N							90.5			85.4									
PE-1	10/04/2006	PE-01-110	N							83.89999			90.1									
PE-1	11/01/2006	PE-01-113	N							83.3			92.5									
PE-1	12/06/2006	PE-01-115	N							85.8			97.2									
PE-1	01/10/2007	PE-01-117	N							103			88.9									
PE-1	02/06/2007	PE-01-119	N							89.5			80.8									
PE-1	03/07/2007	PE-01-121	N							91			84.7									
PE-1	06/13/2007	PE-01-128	N							48.1			52									
PE-1	07/11/2007	PE-01-130	N							39.7			47.1									
PE-1	08/08/2007	PE-01-132	N							60.7			51.4									
PE-1	09/05/2007	PE-01-134	N							49.2			49.1									
PE-1	10/03/2007	PE-01-136	N							45.4			52.6									
PE-1B	02/27/2005	PE-1B-82	N							31.9												
PGE-6	07/01/1997	PGE-6 1530_07/01/1997	FD				30			2700	10 U		3100	2 U		30	10 U				7	25
PGE-6	07/01/1997	PGE-6 1530_07/01/1997	FD				27			2700	22		3100	6		26	1.5 J				10 U	1500
PGE-6	07/01/1997	PGE-6 1750_07/01/1997	N				31			2800	6.5 J		2900	2.5 J		6.7	25 U				10 U	73
PGE-6	07/01/1997	PGE-6(p1)_07/01/1997	FD							720			511									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
PGE-6	07/01/1997	PGE-6(p2)_07/01/1997	FD							3000			2850									
PGE-6	07/01/1997	PGE-6(p3)_07/01/1997	FD							3300			3030									
PGE-6	09/01/1997	PGE-6_09/01/1997	N							2000		6 J	1880				14 J					90
PGE-6	09/01/1997	PGE-6D_09/01/1997	FD							2300		7 J	2330				25 U					50
PGE-6	02/17/1998	PGE-6_02/17/1998	N							888		3.6 J	862				25 UJ					13
PGE-6	02/17/1998	PGE-6D_02/17/1998	FD							937		3.9 J	902				25 U					15
PGE-6	06/15/1998	PGE-6_06/15/1998	N							370		10 U	349				25 U					5 UJ
PGE-6	06/15/1999	PGE-6_06/15/1999	N							20 U		10 U	10 U				25 U					55
PGE-6	09/14/1999	PGE-6_09/14/1999	N							500		10 U	446				25 U					7.9
PGE-6	12/02/1999	PGE-6_12/02/1999	N							20 U		5 J	10 UJ				5					11
PGE-6	03/24/2000	PGE-6_03/24/2000	N							24		47	10 U				2.2 J					200
PGE-6	06/13/2000	PGE-6_06/13/2000	N							27		5 J	10 U				1.8 J					14
PGE-6	09/01/2000	PGE-6_09/01/2000	N				23			170		10 U	160	5 U		12	5.8				10 U	33
PGE-6	12/01/2000	PGE-6_12/01/2000	N							760		4.8 J	787				1.8 J					70
PGE-6	03/28/2001	PGE-6_03/28/2001	N							24		10 U	10 U				1.3 J					6.7 J
PGE-6	06/06/2001	PGE-6_06/06/2001	N							1300		3.4 J	1480				6.3					23
PGE-6	09/12/2001	PGE-6_09/12/2001	N							1100		19	1000				0.91 J					41
PGE-6	11/29/2001	PGE-6_11/29/2001	N				21			880		8.7 J	780	5 U		18	400 U				10 U	91
PGE-6	09/09/2003	PGE-6-007	N							354		11 U	304				26.1 U					26.8
PGE-6	12/09/2003	PG&E-6-009	N							776		10 U	671				20 U					91.8
PGE-6	10/12/2005	PGE-06-081	N							2070			1630									
PGE-7	09/01/1997	PGE-7_09/01/1997	N							4000		10 U	4920				25 U					45
PGE-7	09/01/1997	PGE-7D_09/01/1997	FD							4200		6 J	4660				25 U					45
PGE-7	02/17/1998	PGE-7_02/17/1998	N							742		10 U	827				25 U					15
PGE-7	07/17/1998	PGE-7_07/17/1998	N							4000		10 U	4220				15 J					21 J
PGE-7	06/17/1999	PGE-7_06/17/1999	N							1900		10 U	1900				25 U					39
PGE-7	09/14/1999	PGE-7_09/14/1999	N							4800		10 U	4510				25 U					29
PGE-7	12/02/1999	PGE-7_12/02/1999	N							4400		10 U	4680 J				1.5 J					27
PGE-7	03/24/2000	PGE-7_03/24/2000	N							3900		10 U	4230				1.5 J					31
PGE-7	06/13/2000	PGE-7_06/13/2000	N							4000		2.6 J	4200				1.5 J					32
PGE-7	09/01/2000	PGE-7_09/01/2000	N				38			4800		4.3 J	4790	5 U		56	5.1				1.2 J	10
PGE-7	12/01/2000	PGE-7_12/01/2000	N							3800		10 U	4290				5					83
PGE-7	03/28/2001	PGE-07_03/28/2001	N							4000		10 U	4530				1.7 J					22
PGE-7	06/06/2001	PGE-7_06/06/2001	N							4300		10 U	5080				10					21
PGE-7	09/12/2001	PGE-7_09/12/2001	N							4500		10 U	5400				1.9 J					23
PGE-7	11/29/2001	PGE-7_11/29/2001	N				30 J			4800		400 U	4800	5 U		54	400 U				10 U	46 J

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Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
PGE-7	12/10/2003	PG&E-7-009	N							6780		19.2	4740				20 U					125
PGE-7	10/13/2005	PGE-07-081	N							1 U			1 U									
PGE-7BR	12/19/2007	PGE-07BR-FA001	N							1 U			1 U									
PGE-7BR	05/08/2008	PGE-07BR-143	N							1 U			1.05 U									
PGE-8	07/01/1997	PGE-8_07/01/1997	N				58			16 J		5.2 J	10 U	5 U		74	25 U				10 U	180
PGE-8	09/01/1997	PGE-8_09/01/1997	N							20 U		10 U	10 U				25 U					700
PGE-8	02/17/1998	PGE-8_02/17/1998	N							20 U		10 U	10 U				25 U					170
PGE-8	02/17/1998	PGE-8D_02/17/1998	FD							20 U		10 U	10 U				25 U					170
PGE-8	06/15/1998	PGE-8_06/15/1998	N							20 U		10 U	10 U				25 U					5 UJ
PGE-8	06/15/1998	PGE-8D_06/15/1998	FD							20 U		5.3 J	10 U				25 U					17 J
PGE-8	06/15/1999	PGE-8_06/15/1999	N							20 U		10 U	10 U				25 U					22
PGE-8	09/14/1999	PGE-8_09/14/1999	N							20 U		10 U	10 U				25 U					80
PGE-8	12/01/1999	PGE-8_12/01/1999	N							20 U		3.6 J	10 U				3.7 J					33
PGE-8	03/25/2000	PGE-8_03/25/2000	N							20 U		2.9 J	10 U				3 J					31
PGE-8	06/15/2000	PGE-8_06/15/2000	N							20 U		3.1 J	10 U				45					33
PGE-8	09/01/2000	PGE-8_09/01/2000	N				63			20 U		10 U	10 U	5 U		56	13				10 U	15
PGE-8	12/01/2000	PGE-8_12/01/2000	N							20 U		2.8 J	10 U				5					26
PGE-8	03/28/2001	PGE-8_03/28/2001	N							13 J		10 U	10 U				1.2 J					310
PGE-8	06/06/2001	PGE-8_06/06/2001	N							26		3.6 J	10 U				16					60
PGE-8	08/25/2001	PGE-8_08/25/2001	N							20 U		10 U	10 U				1.6 J					97
PGE-8	09/12/2001	PGE-8_09/12/2001	N							15 J		10 U	10 U				2.8 J					820
PGE-8	11/29/2001	PGE-8_11/29/2001	N				64 J			800 U		400 U	10 U	5 U		78	400 U				10 U	320
PGE-8	12/09/2003	PG&E-8-009	N							3.8		10 U	0.2 U				20 U					94
PGE-8	10/13/2005	PGE-08-081	N							2.1			1 UJ									
PGE-8	08/11/2007	PGE-08-8-11-07-4	N							1 U			1 U									
PT-1D	03/17/2006	DUP 2_031706	FD			5 U				2230			2460									
PT-1D	03/17/2006	PT1D_031706	N			5 U				2270			2470									
PT-1D	04/06/2006	DUP-1_040606	FD			5 U				2690			2960 J									
PT-1D	04/06/2006	PT1D_040606	N			5 U				2770 J			3080									
PT-1M	03/17/2006	PT1M_031706	N			5 U				1 U			1 U									
PT-1M	04/06/2006	PT1M_040606	N			5 U				1			1 UJ									
PT-1S	03/17/2006	PT1S_031706	N			5 U				1.3 U			1 U									
PT-1S	04/06/2006	PT1S_040606	N			5 U				1 U			0.2 U									
PT-2D	03/17/2006	Dup 1_031706	FD			5 U				1570			1670									
PT-2D	03/17/2006	PT2D_031706	N			5 U				1580			1660									
PT-2D	04/06/2006	DUP-2_040606	FD			5 U				2170			2290 J									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
PT-2D	04/06/2006	PT2D_040606	N			5 U				2160			2310									
PT-2M	03/17/2006	PT2M_031706	N			5 U				8.19 U			1 U									
PT-2M	04/06/2006	PT2M_040606	N			5 U				7.58			0.2 U									
PT-2S	03/17/2006	PT2S_031706	N			5 U				1 U			1 U									
PT-2S	04/06/2006	PT2S_040606	N			5 U				1 U			0.2 U									
PT-3D	03/18/2006	PT3D_031806	N			5 U				4370			4390									
PT-3D	04/05/2006	PT3D_040506	N			5 U				4680			4440									
PT-3M	03/18/2006	PT3M_031806	N			5 U				1 U			1 U									
PT-3M	04/07/2006	PT3M_040706	N			5 U				1 U			1 U									
PT-3S	03/16/2006	PT3S_031606	N			5 U				40.3			1 U									
PT-3S	04/03/2006	PT3S_040306	N			5.08				1.48			1 U									
PT-4D	03/15/2006	PT4D_031506	N			5.13				5510												
PT-4D	04/05/2006	PT4D_040506	N			5 U				5480			5960									
PT-4M	03/15/2006	PT4M_031506	N			5 U				1 U												
PT-4M	04/07/2006	PT4M_040706	N			5 U				1.63			1 U									
PT-4S	03/15/2006	PT4S_031506	N			6.22				3.83												
PT-4S	04/06/2006	PT4S_040606	N			6.56				5.84			1 U									
PT-5D	03/16/2006	PT5D_031606	N			5 U				5650			6150									
PT-5D	04/07/2006	PT5D_040706	N			11.5				1 U			0.2 UJ									
PT-5M	03/16/2006	PT5M_031606	N			5 U				1 U			1 U									
PT-5M	04/07/2006	PT5M_040706	N			11.1				1 U			1 UJ									
PT-5S	03/16/2006	PT5S_031606	N			8.86				2.71			1 U									
PT-5S	04/07/2006	PT5S_040706	N			9.36				1 U			1 UJ									
PT-6D	03/16/2006	PT6D_031606	N			5 U				3140			3310									
PT-6D	04/04/2006	PT6D_040406	N			5 U				2180			2270									
PT-6M	03/16/2006	PT6M_031606	N			5 U				1 U			1 U									
PT-6M	04/04/2006	PT6M_040406	N			5 U				1 U			1 U									
PT-6S	03/16/2006	PT6S_031606	N										1 U									
PT-6S	03/18/2006	PT6S_031806	N			12.6				4.6												
PT-6S	04/04/2006	PT6S_040406	N			15.2				1 U			1 U									
PT-7D	07/18/2007	PT-7D_071807	N			7.96				7890			7260									
PT-7M	07/19/2007	PT-7M_071907	N			5 U				2240			2320									
PT-7S	07/18/2007	PT-7S_071807	N			5 U				1260			1200									
PT-8D	07/16/2007	PT-8D_071607	N			7.07				7260			6540									
PT-8M	07/18/2007	PT-8M_071807	N			5 U				4120			3960									
PT-8S	07/16/2007	PT-8S_071607	N			5 U				1660			1750									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
PT-9D	07/17/2007	PT-9D_071707	N			6.28				15600			15700									
PT-9M	07/17/2007	DUP-1_071707	FD			5 U				2270			2240									
PT-9M	07/17/2007	PT-9M_071707	N			5 U				2270			2340									
PT-9S	07/17/2007	PT-9S_071707	N			5 U				1150			1180									
PTI-1D	03/15/2006	PTI-1D_031506	N			5 U				1580												
PTI-1D	04/03/2006	PTI-1D_040306	N			5 U				3370			3350									
PTI-1M	03/15/2006	PTI-1M_031506	N			5 U				8.2												
PTI-1M	04/04/2006	PTI-1M_040406	N			5 U				11.1			3.3									
PTI-1S	03/15/2006	PTI-1S_031506	N			13.2				19.8												
PTI-1S	04/05/2006	PTI-1S_040506	N			7.18				1 U			1 U									
PTR-1	07/19/2007	PTR-1_071907	N			5 U				713			538									
PTR-2	07/18/2007	PTR-2_071807	N			5 U				3380			3190									
TW-1	12/21/2004	TW-01-049	N	52 U	5 U	10 U	42.7	3.1 U	3.1 U	3790	3.1 U	5 U	3820	2.1 U	0.2 U	13.8	5 U	155	87.3	15 U	13.8	38.6
TW-1	10/11/2005	TW-01-081	N							4340			3990									
TW-1	10/11/2007	TW-01-136	N							4220			4610									
TW-1	12/12/2007	TW-01-138	N		3 U	5 U	300 U	1 U	2 U	4090	5 U	10 U		2 U	0.2 U	16.1	20 U	129	5 U	1 U	7.9	84.8
TW-1	03/11/2008	TW-01-141	N		3 U	5 U	300 U	1 U	2 U	2450	5 U	10 U		2 U	0.2 U	13.4	20 U	55.3	12.2	1 U	7.35	88.1
TW-1	05/08/2008	TW-01-143	N		3 U	5 U	500 U	1 U	2 U	3900	5 U	10 U		5.1	0.2 U	22	20 U	87.8	5 U	2 U	5 U	110
TW-2D	06/09/2004	TW-2D_06-09-04	N							6980			7410									
TW-2D	07/29/2004	TW-2D-037	N							5510			5850									
TW-2D	07/29/2004	TW-2D-037Q	N	50 U	155	10 U	27	3 U	3 U	5600	3 U	5 U		100 U	0.5 U	50	5 U	10	3 U	5 U	3 UJ	10
TW-2D	07/29/2004	TW-2D-037Q	N		25 U																	
TW-2D	12/16/2004	TW-2D-049	N	52 U	5 U	10 U	24.8	3.1 U	3.1 U	6570	3.1 U	5 U	6280	2.1 U	0.2 U	44.8	5.1	10 U	3.1 U	15 U	16	28.7
TW-2D	12/16/2004	TW-2D-049	N							6270												
TW-2D	03/09/2005	TW-2D-056	N							5620			5800									
TW-2D	05/05/2005	TW-2D_050505-B1	N							5490												
TW-2D	06/15/2005	TW-02D-070	N	50 U	2 U	4.53	27.6	1 U	1 U	4780	1 U	1 U	5050	1 U	0.2 U	33.2	1 U	3.83	1 U	1 U	9.28	17.5
TW-2D	06/15/2005	TW-02D-070	N							4460												
TW-2D	01/18/2006	TW-02D-089	N							1980			2180									
TW-2D	03/15/2006	TW-02D-093	N							1360			1360									
TW-2D	03/17/2006	TW-02D_031706	N			5 U				1530			1430									
TW-2D	04/05/2006	TW-02D_040506	N			5 U				1240			1350									
TW-2D	05/03/2006	TW-02D-098	N							1120			1120									
TW-2D	10/04/2006	TW-02D-110	N							910			872									
TW-2D	10/04/2007	TW-02D-136	N							228			210									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
TW-2S	06/09/2004	TW-2S_06-09-04	N							6820			7190									
TW-2S	07/29/2004	TW-2S-037	N							5610			5820									
TW-2S	07/29/2004	TW-2S-037Q	N	50 U	25 U	10 U	63	3 U	3 U	5900	3 U	5 U		5 U	0.5 U	30	5 U	20	3 U	5 U	3 U	50
TW-2S	07/29/2004	TW-2S-037Q	N		153																	
TW-2S	12/16/2004	TW-2S-049	N	141	5 U	10 U	56.8	3.1 U	3.1 U	5490	3.1 U	5 U	5080	2.1 U	0.2 U	15.6	5 U	10 U	3.1 U	15 U	10.9	217
TW-2S	12/16/2004	TW-2S-049	N							5050												
TW-2S	03/11/2005	TW-2S-056	N							4240			4400									
TW-2S	06/16/2005	TW-02S-070	N	50 U	2 U	1 U	1 U	1 U	1 U	4180	1 U	1.73	3780	1 U	0.2 U	2 U	1 U	1 U	1 U	1 U	1 U	10 U
TW-2S	06/16/2005	TW-02S-070	N							1 U												
TW-2S	10/07/2005	TW-02S-081	N							3340			3360									
TW-2S	03/15/2006	TW-02S-093	N							2870			2720									
TW-2S	05/03/2006	TW-02S-098	N							2600			2400									
TW-2S	10/04/2006	TW-02S-110	N							2130			1920									
TW-2S	10/04/2007	TW-02S-136	N							1220			1250									
TW-3D	01/18/2006	TW-03D-089	N							4720			4330									
TW-3D	02/08/2006	TW-03D-091	N							2880			3250									
TW-3D	03/08/2006	TW-03D-093	N							3210			3040									
TW-3D	03/17/2006	TW-03D_031706	N			5 U				3070			3350									
TW-3D	04/05/2006	TW-03D_040506	N			5 U				2980			3140									
TW-3D	04/06/2006	TW-03D-095	N							2710			2950									
TW-3D	05/11/2006	TW-03D-098	N							2690			2740									
TW-3D	06/15/2006	TW-03D-102	N							2450			2610									
TW-3D	07/12/2006	TW-03D-104	N							2440			2590									
TW-3D	08/09/2006	TW-03D-106	N							3060			2660									
TW-3D	09/07/2006	TW-03D-108	N							2440			2380									
TW-3D	10/04/2006	TW-03D-110	N							2460			2470									
TW-3D	11/01/2006	TW-03D-113	N							3180			2490									
TW-3D	12/06/2006	TW-03D-115	N							2090			2500									
TW-3D	01/10/2007	TW-03D-117	N							2580			2440									
TW-3D	02/06/2007	TW-03D-119	N							2310			2400									
TW-3D	03/07/2007	TW-03D-121	N							2500			2420									
TW-3D	06/13/2007	TW-03D-128	N							2350			2000									
TW-3D	07/11/2007	TW-03D-130	N							2390			2000									
TW-3D	08/08/2007	TW-03D-132	N							1800			1930									
TW-3D	09/05/2007	TW-03D-134	N							2110			2260									
TW-3D	10/03/2007	TW-03D-136	N							1860			2000									

Table A-1a. Groundwater Data Summary – Site – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
TW-4	05/18/2006	TW-04-001D	N							6.4			1									
TW-4	06/05/2006	TW-04-002C	N							4.1			1 U									
TW-4	10/09/2006	TW-04-110	N							26.6			28.5									
TW-4	03/07/2007	MW-94-121	FD							36.9			35.5									
TW-4	03/07/2007	TW-04-121	N							31.1			35.2									
TW-4	10/03/2007	MW-98-136	FD							32.7			33.6									
TW-4	10/03/2007	TW-04-136	N							32.2			33.4									
TW-4	05/08/2008	TW-04-143	N							23.2			22.6									
TW-5	05/10/2006	TW-05-001C	N							1.3			1.1 J									
TW-5	06/01/2006	TW-05-002C	N							1 U			1 UJ									
TW-5	10/09/2006	TW-05-110	N							3.2			3.6									
TW-5	10/04/2007	TW-05-136	N							7.5			6.6									

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L).

(2) Sample types are as follows:

N = Primary sample; and

FD = Field duplicate sample.

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
CW-1D	02/07/2005	CW-1D	N	64.7	0.5 U	175000	3410	3.34	168	19400	172	0.58		26000	1320000		344	
CW-1D	02/22/2005	CW-01D-002	N	77 J	0.5 U	225000	2830	5 U	500 U	19600	169	0.566		15100	1810000		339	
CW-1D	09/15/2005	CW-01D-003	N	35.7	0.5 U	290000	3320	0.951	300 U	19100	50 U	0.972		22900	2080000		379	
CW-1D	12/19/2005	CW-01D-006	N	31.6	0.5 U	278000	3190	1.5	300 U	19500	500 U	1.22		27100	1470000		403	
CW-1D	06/06/2006	CW-01D-008	N	36.8	0.5 U	172000	2500	3.27	300 U	12400	500 U	3.36		19800	1390000		501	
CW-1D	10/10/2006	CW-01D-010	N	45	0.5 U	148000	2120	4.98	300 U	10200	500 U	3.78		15500	1190000		460	
CW-1D	05/02/2007	CW-01D-012	N	65	0.5 U	117000	2040	4.44	100 U	10300	1 U	2.19		9680	1490000		466	
CW-1D	10/17/2007	CW-01D-014	N	72.5	0.5 U	112000	2100	2.9	100 U	9760	1 U	2.66		9010	1420000		501	
CW-1M	02/08/2005	CW-1M	N	78.1	0.5 U	91000	1210	3.36	50 U	13000	50 U	1.55		14400	570000		478	
CW-1M	02/22/2005	CW-01M-002	N	74.5 J	0.5 U	94900	1250	3.78	500 U	13300	5.09	1.57		10300	732000		239	
CW-1M	09/15/2005	CW-01M-003	N	56.1	0.5 U	122000	1600	2.34	300 U	9410	50 U	1.11		19300	1430000		318	
CW-1M	12/19/2005	CW-01M-006	N	51.1	0.5 U	97800	1550	2.45	300 U	7290	500 U	0.946		16300	837000		295	
CW-1M	12/19/2005	MW-92-006	FD	55.9	0.5 U	96400	1550	2.43	300 U	7170	500 U	0.995		15700	818000		299	
CW-1M	05/02/2006	CW-01M-CIS	N	49	0.5 U	106000	1760	2.72	100 U	8940	1 U	0.832		9590	1310000		355	
CW-1M	10/11/2006	CW-01M-010	N	50	0.5 U	145000	1990	2.9	300 U	9020	500 U	1.44		15500	1120000		357	
CW-1M	05/02/2007	CW-01M-012	N	48	0.5 U	135000	2060	3.27	100 U	11200	1 U	1.83		11000	1450000		416	
CW-1M	10/17/2007	CW-01M-014	N	50	0.5 U	138000	2090	2.66	100 U	10900	1 U	2.31		10900	1420000		443	
CW-2D	02/08/2005	CW-2D	N	40.3	0.5 U	280000	5260	3.32	81.2	15700	332	0.28		37200	2080000		571	
CW-2D	02/23/2005	CW-02D-002	N	37.3 J	0.5 U	278000	4160	5 U	500 U	16300	245	0.5 U		19000	2590000		526	
CW-2D	09/15/2005	CW-02D-003	N	33.1	0.5 U	355000	4170	0.982	300 U	13900	50 U	0.28		30900	2950000		601	
CW-2D	12/05/2005	CW-02D-006	N	29.9	0.5 U	324000	4360	1.44	300 U	12800	500 U	0.338		34300	2100000		700	
CW-2D	06/07/2006	CW-02D-008	N	29.1	0.5 U	280000	4230	3.26	300 U	12400	500 U	0.385		34400	2310000		554	
CW-2D	10/11/2006	CW-02D-010	N	32.5	0.5 U	271000	3790	3.62	300 U	9650	500 U	1.29		24200	2120000		546	
CW-2D	05/04/2007	CW-02D-012	N	42	0.5 U	106000	2660	1.29	100 U	5680	1 U	1.96		11500	1880000		526	
CW-2D	10/18/2007	CW-02D-014	N	46.7	0.5 U	77200	2100	7.26	100 U	4280	1 U	2.69		9860	1540000		489	
CW-2M	02/09/2005	CW-2M-001	N	74.4	0.5 U	85700	1600	3.51	50 U	7340	50 U	1.08		15700	837000		280	
CW-2M	02/09/2005	CW-90-001	FD	74.4	0.5 U	87800	1550	3.64	53.3	7500	50 U	1.08		16400	833000		294	
CW-2M	02/23/2005	CW-02M-002	N	67.1 J	0.5 U	98200	1620	5 U	500 U	7580	5 U	0.945		10100	1190000		289	
CW-2M	09/15/2005	CW-02M-003	N	51	0.5 U	110000	1880	2.3	300 U	7090	50 U	0.908		16000	1330000		342	
CW-2M	09/15/2005	MW-91-003	FD	48.4	0.5 U	103000	1870	2.3	300 U	6330	50 U	0.96		14200	1180000		341	
CW-2M	12/06/2005	CW-02M-006	N	54.3	0.5 U	112000	1690	2.53	300 U	8660	500 U	1		18800	935000		339	
CW-2M	12/06/2005	MW-91-006	FD	57	0.5 U	112000	1790	2.55	300 U	8760	500 U	0.962		18500	944000		363	
CW-2M	05/02/2006	CW-02M-CIS	N	51.7	0.5 U	113000	1900	2.82	100 U	8720	1.19	0.821		10500	1450000		372	
CW-2M	10/11/2006	CW-02M-010	N	49.5	0.5 U	140000	1880	3.14	300 U	7260	500 U	1.01		17700	1160000		370	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
CW-2M	05/04/2007	CW-02M-012	N	50	0.5 U	113000	2060	3.09	100 U	8740	1 U	0.703		10200	1350000		353	
CW-2M	10/18/2007	CW-02M-014	N	50	0.5 U	118000	2000	3.17	100 U	9370	1 U	1.09		10300	1350000		376	
CW-3D	02/08/2005	CW-3D	N	52.5	0.5 U	340000	5100	2.08	182	29500	628	0.34		41000	2160000		561	
CW-3D	02/22/2005	CW-03D-002	N	77 J	0.5 U	346000	5060	5 U	500 U	29200	810	0.5 U		26400	3160000		546	
CW-3D	09/16/2005	CW-03D-003	N	33.1	0.5 U	422000	4930	1.4	300 U	29200	259	0.304		39800	3030000		672	
CW-3D	12/05/2005	CW-03D-006	N	35.3	0.5 U	424000	5640	0.5 U	300 U	24800	500 U	0.333		44900	2490000		794	
CW-3D	06/07/2006	CW-03D-008	N	33.5	0.5 U	367000	4800	2.23	300 U	22100	500 U	0.251		35500	2600000		615	
CW-3D	10/11/2006	CW-03D-010	N	32	0.5 U	353000	4500	2.87	300 U	18100	500 U	0.329		31700	2440000		615	
CW-3D	05/02/2007	CW-03D-012	N	37	0.5 U	207000	3700	5.05	100 U	16200	1.96	1.21		16900	2510000		594	
CW-3D	10/18/2007	CW-03D-014	N	46.7	0.5 U	105000	2570	5.84	100 U	8130	1 U	2.62		12100	1820000		546	
CW-3M	02/10/2005	CW-3M-001	N	62.2	0.5 U	152000	2370	3.12	50 U	14600	54.1	0.87		24400	1080000		352	
CW-3M	02/22/2005	CW-03M-002	N	87 J	0.5 U	186000	2250	5 U	500 U	15500	23.2	0.604		12500	1530000		351	
CW-3M	09/16/2005	CW-03M-003	N	45.9	0.5 U	205000	2960	2.57	300 U	14000	50 U	0.642		21100	1550000		464	
CW-3M	12/05/2005	CW-03M-006	N	48.8	0.5 U	224000	2600	2.22	300 U	11500	500 U	0.778		18800	1190000		420	
CW-3M	06/07/2006	CW-03M-008	N	45.7	0.5 U	209000	2740	2.28	300 U	15400	500 U	0.594		24500	1400000		444	
CW-3M	10/10/2006	CW-03M-010	N	45	0.5 U	252000	2690	2.77	300 U	15300	500 U	0.831		21100	1320000		381	
CW-3M	05/02/2007	CIS-001	N	45	0.5 U	221000	2900	3.47	100 U	18300	1 U	5.98		13900	1760000		401	2 U
CW-3M	05/02/2007	MW-91-012	FD	46	1 U	222000	2730	3.58	100 U	18100	1 U			13900	1780000		398	
CW-3M	10/18/2007	CW-03M-014	N	46.7	0.5 U	207000	2660	2.88	100 U	17500	1 U	0.799		13300	1670000		400	
CW-4D	02/07/2005	CW-4D	N	65.9	0.5 U	287000	4270	3.21	114	18600	302	0.27		34200	1890000		530	
CW-4D	02/23/2005	CW-04D-002	N	39.7 J	0.5 U	282000	4130	5 U	500 U	19800	308	0.5 U		18000	2530000		508	
CW-4D	09/13/2005	CW-04D-003	N	31	0.5 U	367000	3710	1.01	300 U	21900	181	0.188		36600	2490000		534	
CW-4D	12/06/2005	CW-04D-006	N	38	0.5 U	318000	3560	1.73	300 U	20900	500 U	0.238		34100	1860000		608	
CW-4D	06/06/2006	CW-04D-008	N	39.2	0.5 U	284000	3710	2.8	300 U	17200	500 U	0.417		24000	2840000		504	
CW-4D	10/11/2006	CW-04D-010	N	31.5	0.5 U	353000	3850	3.2	300 U	14700	500 U	0.469		25600	2230000		575	
CW-4D	05/01/2007	CW-04D-012	N	36.5	0.5 U	217000	3260	4.55	100 U	14300	3.38	1.28		13600	2250000		569	
CW-4D	10/18/2007	CW-04D-014	N	40	0.5 U	197000	3280	5.01	100 U	12600	4.02	1.24		13300	2140000		549	
CW-4M	02/07/2005	CW-4M	N	70.8	0.5 U	124000	1600	2.42	50.9	10400	50 U	1.48		17900	751000		241	
CW-4M	02/23/2005	CW-04M-002	N	64.6 J	0.5 U	113000	1590	5 U	500 U	9480	15.2	1.46		9800	1010000		237	
CW-4M	09/13/2005	CW-04M-003	N	51.7	0.5 U	149000	1560	1.5	300 U	10400	50 U	1.18		20900	1230000		240	
CW-4M	12/06/2005	CW-04M-006	N	73.3	0.5 U	237000	1200	1.73	300 U	18100	500 U	0.1 U		31500	1490000		230	
CW-4M	06/06/2006	CW-04M-008	N	53.9	0.5 U	171000	1780	1.63	300 U	9510	500 U	1.72		17700	1200000		262	
CW-4M	10/11/2006	CW-04M-010	N	55	0.5 U	156000	1730	2	300 U	9770	500 U	1.96		15600	937000		282	
CW-4M	05/01/2007	CIS-007	N	55	0.5 U	137000	1780	2.27	100 U	11500	1 U	1.77		10300	1200000		289	2 U

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
CW-4M	10/18/2007	CW-04M-014	N	55	0.5 U	123000	1760	2.19	100 U	11200	1 U	1.55		9990	1120000		342	
CW-4M	10/18/2007	MW-91-014	FD	55	0.5 U	125000	1760	2.05	100 U	11400	1 U	1.39		10300	1160000		338	
MW-1	07/26/1997	07-26-1997_MW-1	N					1.6										
MW-1	09/01/1997	MW-1_09/01/1997	N	75		19300	93			3400				3600	104000		52	
MW-1	10/28/1997	MW-1_10/28/1997_LS	N					7.95										
MW-1	12/18/1997	MW-1_12/18/1997_LS	N					1										
MW-1	02/18/1998	MW-1_02/18/1998	N					1.55										
MW-1	05/14/1998	MW-1_5/14/1998_LS	N					1.1										
MW-1	05/09/2005	MW-01-BKG-001	N	70.4	0.5 U	26000	111	0.735	100 U	5130	3.21	6.28	2 U	3960	119000		77.3	2 U
MW-1	07/18/2005	MW-01-BKG-002	N	66.1	0.5 U	30200	118	0.891	100 U	6090	4.34	6.16 J	2 U	4470	135000		66.6	2 U
MW-3	07/26/1997	07-26-1997_MW-3	N					3.2										
MW-3	07/26/1997	07-26-1997_MW-3D	FD					3.47										
MW-3	09/01/1997	MW-3_09/01/1997	N	73		43900	198			7300				6300	243000		259	
MW-3	09/01/1997	MW-3D_09/01/1997	FD	69		43500	199			7300				6400	246000		263	
MW-3	10/28/1997	MW-3_10/28/1997	N					3.85										
MW-3	02/18/1998	MW-3_02/18/1998	N					2.4										
MW-3	02/18/1998	MW-3D_02/18/1998	FD					2.78										
MW-3	05/14/1998	MW-3_5/14/1998	N					3.1										
MW-3	05/09/2005	MW-03-BKG-001	N	89.8	0.5 U	35500	159	2.98	100 U	6590	19.3	11	2.43	4750	225000		182	2 U
MW-3	07/18/2005	MW-03-BKG-002	N	81.3	0.5 U	35800	164	3.05	100 U	6760	3.24	9 J	2 U	4930	234000		172	2 U
MW-4	07/26/1997	07-26-1997_MW-4	N					2.43										
MW-4	09/01/1997	MW-4_09/01/1997	N	98		30200	135			5000				6900	182000		190	
MW-4	10/28/1997	MW-4_10/28/1997_LS	N					2.3										
MW-4	02/18/1998	MW-4_02/18/1998	N					3.01										
MW-4	05/14/1998	MW-4_5/14/1998_LS	N					2.1										
MW-4	05/09/2005	MW-04-BKG-001	N	104	0.5 U	27300	111	1.93	100 U	4920	3.19	6.28	2 U	4870	178000		151	2 U
MW-4	07/18/2005	MW-04-BKG-002	N	107	0.5 U	30100	115	1.73	100 U	5590	1.76	5.49 J	2 U	5750	202000		152	2 U
MW-5	07/26/1997	07-26-1997_MW-5	N					6.6										
MW-5	09/01/1997	MW-5_09/01/1997	N	71		42500	233			7500				7100	248000		212	
MW-5	10/28/1997	MW-5_10/28/1997_LS	N					6.1										
MW-5	02/18/1998	MW-5_02/18/1998	N					5.01										
MW-5	05/14/1998	MW-5_5/14/1998_LS	N					6.2										
MW-5	05/13/2005	MW-05-BKG-001	N	62.6	0.5 U	46900	232	4.73	100 U	9130	3.51	18.9 J	3	5770	262000		227	2 U
MW-5	07/18/2005	MW-05-BKG-002	N	68.6	0.5 U	52000	230	4.97	100 U	10200	1.34	14.8 J	3.77	6600	291000		214	2 U

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-6	07/26/1997	07-26-1997_MW-6	N					8.6										
MW-6	09/01/1997	MW-6_09/01/1997	N	2 U	180	9800				1800				3600	139000		95	
MW-6	10/28/1997	MW-6_10/28/1997_LS	N					8.3										
MW-6	02/18/1998	MW-6_02/18/1998	N					7.92										
MW-6	05/14/1998	MW-6_5/14/1998_LS	N					8.45										
MW-6	05/13/2005	MW-06-BKG-001	N	180	0.5 U	9740	18.9	6.87	100 U	1970	2.21	2.77	2 U	3080	148000		57.4	2 U
MW-6	07/18/2005	MW-06-BKG-002	N	183	0.5 U	9600	21.5	7.24	100 U	2030	1 U	2.69	2 U	3610	150000		69	2 U
MW-7	07/26/1997	07-26-1997_MW-7	N					3.78										
MW-7	09/01/1997	MW-7_09/01/1997	N	107		18000	127			3100				5000	203000		163	
MW-7	10/28/1997	MW-7_10/28/1997_LS	N					4.6										
MW-7	02/18/1998	MW-7_02/18/1998	N					3.8										
MW-7	05/14/1998	MW-7_5/14/1998_LS	N					4.3										
MW-7	05/13/2005	MW-07-BKG-001	N	107	0.5 U	14700	117	4.68	100 U	2720	17.3	7.83	2 U	3510	207000		151	2 U
MW-7	07/18/2005	MW-07-BKG-002	N	112	0.5 U	16000	119	5.07	100 U	3110	1.85	7.06 J	2 U	4060	233000		153	2 U
MW-8	07/26/1997	07-26-1997_MW-8	N					1.3										
MW-8	09/01/1997	MW-8_09/01/1997	N	75		49400	108			8800				7000	189000		265	
MW-8	10/28/1997	MW-8_10/28/1997_LS	N					1.5										
MW-8	02/18/1998	MW-8_02/18/1998	N					1.24										
MW-8	05/14/1998	MW-8_5/14/1998_LS	N					1.1										
MW-8	05/13/2005	MW-08-BKG-001	N	73	0.5 U	52100	91.6	0.868	100 U	9920	2.98	20.5 J	2 U	6600	201000		273	2 U
MW-8	07/18/2005	MW-08-BKG-002	N	76.2	0.5 U	55800	94.7	1	100 U	11000	1.32	15 J	2 U	7440	224000		284	2 U
MW-9	07/01/1997	MW-9_07/01/1997	N	126	0.2	204000	800	0.2		58700	250	0.7903		16900	321000		246	0.2 U
MW-9	07/01/1997	MW-9_07/01/1997	N	120	0.08	200000	780	0.13		59000	230	1.62576		13000	320000		240	0.02 U
MW-9	09/01/2000	MW-9_09/01/2000	N	121	0.2 J	246000	945	0.2		64200	2.4 J	1.9193		20700	330000		270	2 UJ
MW-9	11/28/2001	MW-9_11/28/2001	N	111	0.2 U	251000	982	0.18		67300	2.8 J	2.07736		16600	323000		264	0.2 U
MW-9	06/12/2003	MW-9-006	N	148	0.5 U	235000	592	0.2 U	500 U	61400	500 U	8.6		17800	397000		238	
MW-9	06/09/2004	MW-9-030	N	120	0.1 U	221000	780	0.1 U	500 U	47000	10 U	9.1		12500	396000		250	0.4 U
MW-9	12/17/2004	MW-09-049	N			223000			300 U	57300	50 U			15900	247000			
MW-9	03/07/2006	MW-09-093	N	131	0.5 U	176000	665		500 U	47800	500 U	9.53		12000	377000		229	
MW-9	03/07/2006	MW-90-093	FD	134	0.5 U	169000	665		500 U	46000	500 U	9.39		11700	352000		227	
MW-9	05/03/2007	CIS-003	N	128	1 U	152000	733	0.5 U	100 U	44300	1 U	22.6		12200	415000		246	2 U
MW-9	10/04/2007	MW-09-136	N			159000			20 U	49000	20 U				428000			
MW-10	07/01/1997	MW-10_07/01/1997	N	388	0.44	42200	280	23.9		10210	670	3.81602		13800	456000		341	0.2 U
MW-10	09/01/2000	MW-10_09/01/2000	N	371	0.2 J	59800	393	24.6		9100	1.4 J	3.8386		13400	517000		410	2 UJ

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-10	11/28/2001	MW-10_11/28/2001	N	315	0.2 U	51700	524	15.9		8500	2.6 J	4.1773		6100	364000		445	0.2 U
MW-10	06/12/2003	MW-10-006	N	309	0.5 U	120000	732	11.7	500 U	19700	500 U	16.1		15500	773000		433	
MW-10	06/10/2004	MW-10-030	N	240	0.1 U	134000	740	10	500 U	16200		15		22400	808000		420	0.4 U
MW-10	09/21/2004	MW-10-043	N							18800	500 U							
MW-10	12/17/2004	MW-10-049	N			103000			300 U	16600	50 U			13300	478000			
MW-10	03/08/2005	MW-10-056	N			95700			50 U	17200	50 U			18000	626000			
MW-10	03/08/2005	MW-90-056	FD			101000			50 U	18200	50 U			20400	616000			
MW-10	06/16/2005	MW-10-070	N			119000			100 U	21000	1 U			11800	746000	1510		
MW-10	03/06/2006	MW-10-093	N	298	0.5 U	68800	474		100 U	11500	1 U	14		8590	562000		359	
MW-10	05/04/2006	MW-10-CIS	N	261	0.5 U	74700	552	10.9	100 U	12700	1 U	10.6		9010	639000		392	
MW-10	12/14/2006	MW-10-115	N			37000				5910				7040	487000			
MW-10	10/02/2007	MW-10-136	N			59800			100 U	11500	20 U				461000			
MW-10	10/02/2007	MW-10-136	N						20 U									
MW-11	07/01/1997	MW-11_07/01/1997	N	141	0.4	173000	590	1.4		28600	500	1.62576		17100	332000		415	0.2 U
MW-11	09/01/2000	MW-11_09/01/2000	N	108	0.1 J	202000	592	0.97		26000	3.3 J	1.98704		14800	330000		490	0.2 UJ
MW-11	11/28/2001	MW-11_11/28/2001	N	121	0.2 U	125000	530	0.98		16600	3.5 J	0.51934		7000	209000		425	0.2 U
MW-11	06/12/2003	MW-11-006	N	126	0.5 U	172000	418	0.73	500 U	22200	500 U	8.6		11600	305000		344	
MW-11	06/12/2003	MW-41-006	FD	126	0.5 U	174000	468	0.69	500 U	21000	500 U	8.7		11300	346000		343	
MW-11	06/10/2004	MW-11-030	N	100	0.1 U	197000	460	0.6	500 U	19100		8.3		9160	326000		320	0.4 U
MW-11	09/21/2004	MW-11-043	N							22400	500 U							
MW-11	12/17/2004	MW-11-049	N			170000			300 U	21000	50 U			15000	224000			
MW-11	03/08/2005	MW-11-056	N			160000			50 U	22000	50 U			15900	335000			
MW-11	06/16/2005	MW-11-070	N			187000			100 U	24900	1 U			11200	345000	2180		
MW-11	03/06/2006	MW-11-093	N	97.6	0.5 U	179000	498		100 U	23800	1 U	9.21		9640	345000		328	
MW-11	05/03/2007	CIS-021	N	92.5 J	1 U	128000	469	1.02	100 U	18500	1 U	9.64 J		8310	286000		282	2 U
MW-11	05/03/2007	CIS-089	FD	148 J	1 U	130000	466	0.998	100 U	18500	1 U	16.4 J		8410	288000		324	2 U
MW-11	07/17/2007	MW-11_071707	N	87.5		125000	470		500 U		5 U	8.44		8330	280000		251	2 U
MW-12	07/01/1997	MW-12_07/01/1997	N	316	0.2	5800	595	6.59		1600	14	0.51934		5400	556000		185	0.2 U
MW-12	09/01/2000	MW-12_09/01/2000	N	556	0.4 J	25600	557	3.87		4300	7.5	2.4838		6800	745000		559	0.2 UJ
MW-12	11/29/2001	MW-12_11/29/2001	N	371	0.2 U	10300	854	3.9		1900	4.6 J	1.6935		4100	894000		206	0.2 U
MW-12	06/11/2003	MW-12-006	N	264	0.5 U	9070	1050	2.9	500 U	2050	500 U	4.3		7620	910000		251	
MW-12	06/09/2004	MW-12-030	N	200	0.1 U	9920	1100	2.9	500 U	2020	10 U	4.6		3150	1030000		270	0.8
MW-12	06/09/2004	MW-92-030	FD	200	0.1 U	9950	1200	2.9	500 U	1970	10 U	4.6		3220	993000		260	0.4 U
MW-12	09/20/2004	MW-12-043	N							2250	500 U							

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-12	03/10/2005	MW-12-056	N			9680			50 U	1730	50 U			8540	745000			
MW-12	03/10/2005	MW-91-056	FD			8360			50 U	1580	50 U			8510	714000			
MW-12	06/13/2005	MW-12-070	N			8630			500 U	1670	500 U			4550	762000	436		
MW-12	06/13/2005	MW-12-070	N			10300			100 U	2180	4.03			4070	963000			
MW-12	09/16/2005	MW-12-003	N	235	0.729	7120	778	3.75	300 U	1320	107	4.13		4630	718000		295	
MW-12	12/13/2005	MW-12-087	N						300 U		500 U							
MW-12	04/18/2006	MW-12-093	N	242	0.5 U	7570	821		100 U	1620	1 U	4.7		3360	789000		262	
MW-12	05/01/2006	MW-12-098	N			8130			100 U	1620	1 U			3410	870000			
MW-12	10/04/2007	MW-12-136	N			21200			500 U	4990	500 U				1340000			
MW-12	10/04/2007	MW-90-136	FD						500 U		500 U							
MW-13	07/01/1997	MW-13_07/01/1997	FD	110	0.09	130000	470	0.45		21000	240	0.88062		9800	220000		160	0.02 U
MW-13	07/01/1997	MW-13_07/01/1997	N	88.2	0.2	123000	475	0.71		20300	210	1.15158		10500	222000		159	0.2 U
MW-13	09/01/2000	MW-13_09/01/2000	N	82	0.02 UJ	109000	537	1.5		15000	3.1 J	0.94836		9700	293000		184	0.2 UJ
MW-13	11/29/2001	MW-13_11/29/2001	N	102	0.2 U	100000	528	1.4		13600	15	1.17416		6100	281000		144	0.2 U
MW-13	06/12/2003	MW-13-006	N	97.6	0.5 U	112000	500	1.2	500 U	14600	500 U	4.2		10000	311000		166	
MW-13	06/09/2004	MW-13-030	N	79	0.1 U	124000	500	1	500 U	13300	10 U	4.4		5470	300000		150	0.4 U
MW-13	12/13/2005	MW-90-087	FD						300 U		500 U							
MW-13	03/08/2006	MW-13-093	N	89.9	0.5 U	103000	424		500 U	12900	500 U	4.68		6690 U	253000 J		153	
MW-13	03/08/2006	MW-91-093	FD	84.8	0.5 U	103000	419		500 U	12900	500 U	4.6		6140 U	254000 J		152	
MW-13	05/02/2006	MW-13-CIS	N	87.1	0.5 U	95700	396	1.28	100 U	13300	1 U	4.57		6050	288000		161	
MW-13	10/02/2007	MW-13-136	N			88300			20 U	13000	20 U				238000			
MW-14	07/01/1997	MW-14_07/01/1997	N	90.4	0.1 J	64800	340	3.2		12300	240	1.10642		10300	232000		160	0.2 U
MW-14	09/01/2000	MW-14_09/01/2000	N	84	0.02 UJ	73500	378	2.36		10900	1.2 J	1.26448		10800	242000		174	0.2 UJ
MW-14	11/30/2001	MW-14_11/30/2001	N	85.2	0.2 U	68800	368	2.4		10300	33	1.30964		7900	229000		108	0.2 U
MW-14	06/12/2003	MW-14-006	N	106	0.5 U	64100	340	2	500 U	9760	500 U	5.6		10200	210000		142	
MW-14	06/08/2004	MW-14-030	N	89	0.1 U	66500	310	1.8	500 U	9000	10 U	5.5		6430	237000		140	0.4 U
MW-14	06/08/2004	MW-90-030	FD	88	0.1 U	73300	310	1.8	500 U	9100	10 U	5.5		6930	262000		140	0.4 U
MW-14	09/08/2004	MW-14-042	N						20.8 U			5.74						
MW-14	05/11/2005	MW-14-WQ6	N			70700			1010	10300	34			7810	227000			
MW-14	03/09/2006	MW-14-093	N	89.9	0.5 U	68900	302		500 U	9810	500 U	5.18		6540	215000		136	
MW-14	05/02/2006	MW-14-CIS	N	87.1	0.5 U	73000	312	2.2	100 U	10900	1 U	5.37		8020	242000		126	
MW-14	10/02/2007	MW-14-136	N			62500			60.7	9910	20 U				191000			
MW-15	07/01/1997	MW-15_07/01/1997	N	92.7	0.08 J	53800	255	1.3		16800	580	0.72256		9500	163000		132	0.2 U
MW-15	09/01/2000	MW-15_09/01/2000	N	104	0.2 J	68900	313	0.83		16100	0.86 J	0.99352		8900	186000		134	0.2 UJ

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-15	11/29/2001	MW-15_11/29/2001	N	85.2	0.14 J	89200	424	0.87		21600	13	1.30964		7300	182000		108	0.2 U
MW-15	06/12/2003	MW-15-006	N	106	0.5 U	89400	333	0.8	500 U	20700	500 U	4.8		10400	179000		111	
MW-15	06/07/2004	MW-15-030	N	81	0.1 U	95300	330	0.4	500 U	22500	10 U	4.6		6960	170000		110	0.4 U
MW-15	03/07/2006	MW-15-093	N	77.1	0.5 U	139000	420		500 U	34900	500 U	5.65		11200	207000		138	
MW-15	05/04/2007	CIS-026	N	72.5	0.5 U	139000	542	0.54	100 U	32800	1 U	9.73		9900	191000		185	2 U
MW-15	10/02/2007	MW-15-136	N			89100			20 U	23900	20 U				157000			
MW-19	06/15/1998	MW-19_06/15/1998	N	84	0.2	125000	634			18900	18	1.10642 J		11600 J	341000		203	0.2 U
MW-19	09/01/2000	MW-19_09/01/2000	N	88	0.1 J	123000	667	2.27		19500	1.8 J	0.99352		12700	358000		182	0.2 UJ
MW-19	11/29/2001	MW-19_11/29/2001	N	76.7	0.2 U	117000	663	2.4		17900	10	1.129		8300	358000		131	0.2 U
MW-19	06/11/2003	MW-19-006	N	100	0.5 U	125000	574	2.5	500 U	18900	500 U	4.8		9630	345000		181	
MW-19	06/08/2004	MW-19-030	N	83	0.1 U	114000	540	1.7	500 U	16100	10 U	4.9		6360	309000		190	0.4 U
MW-19	03/09/2006	MW-19-093	N	92.5	0.5 U	116000	484		500 U	17800	500 U	4.88		7450	332000		195	
MW-19	05/02/2006	MW-19-CIS	N	81.6	0.5 U	118000	502	2.26	100 U	18800	1 U	4.86		8150	358000		191	
MW-19	10/05/2007	MW-19-136	N			110000			20 U	19300	20 U				334000			
MW-20-70	06/15/1998	MW-20/70_06/15/1998	N	81	0.2 J	228000	876			52400	12	9.52876 J		17600 J	439000		459	0.2 U
MW-20-70	06/15/1999	MW-20/70_06/15/1999	N	79	0.54	213000	917	2.15		48800	5 U	8.1288		13900	431000		389	0.2 U
MW-20-70	09/01/2000	MW-20/70_09/01/2000	N	84	0.3 J	203000	841	2.3		44900	4.9 J	2.4838		16200	460000		474	0.2 UJ
MW-20-70	11/30/2001	MW-20/70_11/30/2001	N	98	0.2 U	216000	849	2.1		51500	6.6	3.31926		12500	510000		354	0.22
MW-20-70	06/11/2003	MW-20-70-006	N	89.1	0.5 U	245000	909	1.9	500 U	60600	500 U	8.8	20 U	14000	462000		430	
MW-20-70	03/03/2004	MW-20-70-016	N	75		230000	890			52000		9.7		11000	480000		440	
MW-20-70	03/03/2004	MW-90-016	FD	72		220000	890			51000		9.7		11000	460000		440	
MW-20-70	05/11/2004	MW-20-070-026	N	76		210000	800			48000		10		9700	490000		450	
MW-20-70	06/11/2004	MW-20-70-030	N		0.1 U													0.4 U
MW-20-70	09/24/2004	MW-20-070-043	N	74		180000	824			58500	500 U	9.7		12000	430000		402	
MW-20-70	09/24/2004	MW-20-070-043	N							52000								
MW-20-70	12/16/2004	MW-20-070-049	N	70		138000	753	2.66 J	300 U	52500	50 U	9.68		12000 J	410000		374	
MW-20-70	12/16/2004	MW-20-070-049	N			177000 J								9050				
MW-20-70	12/16/2004	MW-20-070-049	N	70		177000 J	753	2.66 J	300 U	52500	50 U	9.68		9050	410000		374	
MW-20-70	03/10/2005	MW-20-70-056	N	81.7		198000	740		50 U	55400	50 U	9.98		9890	431000		378	
MW-20-70	06/15/2005	MW-20-070-070	N	73.8	0.5 U	189000	749	1.83	100 U	55400	1 UJ	9.79		10500	433000	2970	388	
MW-20-70	06/15/2005	MW-92-070	FD	71.3	0.5 U	204000	760	1.82	100 U	60700	7.7 J	9.81		11400	468000	3250	392	
MW-20-70	10/11/2005	MW-20-070-081	N	69.9		198000	737		300 U	49900	500 U	9.48		14600	323000		359	
MW-20-70	12/15/2005	MW-20-070-087	N	77.8		138000	645		300 U	42300	500 U	9.9		14500	267000		326	
MW-20-70	03/10/2006	MW-20-070-093	N	82.2	0.5 U	161000	679		100 U	48600	1 U	10.5		9220	424000		358	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-20-70	05/05/2006	MW-20-070-CIS	N	74.5	0.5 U	162000	696	1.34	100 U	49200	1 U	9.86		9550	461000		376	
MW-20-70	10/03/2006	MW-20-070-110	N	85		158000	677			47600		13		9820	472000		357	
MW-20-70	10/03/2006	MW-90-110	FD	80		154000	669			45900		12.9		9510	466000		352	
MW-20-70	12/13/2006	MW-20-070-115	N	77.5		149000	678			44300		12.7		9090	458000		352	
MW-20-70	03/14/2007	MW-20-070-121	N	80		139000	689			42200		13.7		8830	451000		358	
MW-20-70	05/03/2007	MW-20-070-125	N	77.5		139000	697			41200		25.1		8650	390000		344	
MW-20-70	10/11/2007	MW-20-070-136	N	80		130000	699		20 U	39100	20 U	15.6		11000	600000		367	
MW-20-100	06/15/1999	MW-20/100_06/15/1999	N	79	11	156000	1400	3.5		20000	200	4.516		15800	1220000		1060	0.03
MW-20-100	09/01/2000	MW-20/100_09/01/2000	N	97	0.2 UJ	157000	1380	3.6		19700	56	2.9354		19700	1150000		884	0.2 UJ
MW-20-100	11/30/2001	MW-20/100_11/30/2001	N	89.5	0.2 U	147000	1360	3.4		20100	45	3.40958		12300	1050000		659	0.2 U
MW-20-100	06/11/2003	MW-20-100-006	N	97.6	0.5 U	165000	1360	1.9	500 U	20700	500 U	9.3	28 U	15600	1050000		726	
MW-20-100	03/03/2004	MW-20-100-016	N	82		170000	1300			20000		9.6		11000	1100000		740	
MW-20-100	05/11/2004	MW-20-100-026	N	81		150000	1300			18000		9.6		10000	1100000		700	
MW-20-100	06/11/2004	MW-20-100-030	N		0.1 U													0.4 U
MW-20-100	09/24/2004	MW-20-100-043	N	100		140000	1180			23000		8.85		13000	860000		621	
MW-20-100	12/16/2004	MW-20-100-049	N	90		152000	1050	4.77 J		23400		8.5		16600	772000		562	
MW-20-100	03/10/2005	MW-20-100-056	N	84.2		133000	466			19800		9.98		8980	712000		511	
MW-20-100	06/15/2005	MW-20-100-070	N	84	0.5 U	137000	921	2.86	500 U	21300	500 U	9.02		9060	592000		506	
MW-20-100	10/11/2005	MW-20-100-081	N	82.3		170000	887			23700		8.87		15200	500000		484	
MW-20-100	12/15/2005	MW-20-100-087	N	82.7		136000	813			21400		9.65		14800	406000		404	
MW-20-100	03/10/2006	MW-20-100-093	N	92.5	0.5 U	171000	861		500 U	27000	500 U	9.94		7750	597000		475	
MW-20-100	05/05/2006	MW-20-100-098	N	82.5		193000	927			32000		9.99		10800	577000		522	
MW-20-100	10/03/2006	MW-20-100-110	N	90		202000	863			34400		13.4		10900 J	568000		456	
MW-20-100	12/13/2006	MW-20-100-115	N	97.5		205000	861			32200		12.3		11400	579000		459	
MW-20-100	12/13/2006	MW-90-115	FD	92.5		205000	874			32200		12.2		9550	575000		457	
MW-20-100	03/14/2007	MW-20-100-121	N	87.5		194000	847			31700		14.2		9900	521000		477	
MW-20-100	05/03/2007	MW-20-100-125	N	87.5		209000	879			36000		23.2		12000 J	559000		493	
MW-20-100	05/03/2007	MW-90-125	FD	87.5		208000	888			34600		19.7		9630 J	532000		484	
MW-20-100	10/10/2007	MW-20-100-136	N	92		190000	858		35	32000	20 U	3.25		15000	560000		468	
MW-20-130	06/15/1999	MW-20/130_06/15/1999	N	54	0.73	421000	6050	3.2		23900	51	6.0966		51200	3800000		946	0.2 U
MW-20-130	09/01/2000	MW-20/130_09/01/2000	N	46	0.2 J	430000	5820	3.2		22200	1 J	7.2256		61700	3650000		1220	0.2 UJ
MW-20-130	11/30/2001	MW-20/130_11/30/2001	N	51.1	0.2 U	409000	6000	3.3		21700	5 U	6.6611		43800	3660000		934	0.2 U
MW-20-130	06/11/2003	MW-20-130-006	N	57.3	0.5 U	418000	5790	3.6	500 U	19800	500 U	6.1	40 U	54200	3630000		967	
MW-20-130	03/03/2004	MW-20-130-016	N	45		400000	6200			19000		6.2		35000	3500000		960	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-20-130	05/11/2004	MW-20-130-026	N	62		280000	3300			14000		9.8		26000	2500000		1000	
MW-20-130	06/11/2004	MW-20-130-030	N		0.1 U													0.4 U
MW-20-130	09/24/2004	MW-20-130-043	N	66		240000	7240			15000	500 U	9.8		33000	2400000		2280	
MW-20-130	09/24/2004	MW-20-130-043	N							14700								
MW-20-130	01/27/2005	MW-20-130-049	N	80.5		313000	3790	2.45	50 U	16100	50 U	10.4		43500	2260000		1140	
MW-20-130	03/09/2005	MW-20-130-056	N	68.9		219000	3120		50 U	12100	50 U	10.9		24700	2250000		1080	
MW-20-130	03/09/2005	MW-93-056	FD	68.9		231000	3080		50 U	12800	50 U	10.9		25400	2390000		1080	
MW-20-130	06/15/2005	MW-20-130-070	N	68.7	0.5 U	352000	3410	2.52	100 U	23200	1 U	11.1		31300	2980000	7540	1230	
MW-20-130	10/07/2005	MW-20-130-081	N	72.4		349000	3010		300 U	13900	500 U	10.9		38400	2070000		1210	
MW-20-130	12/16/2005	MW-20-130-087	N	63.2		324000	3260		300 U	16300	500 U	10.7		44400	1780000		1000	
MW-20-130	03/10/2006	MW-20-130-093	N	74.5	0.5 U	312000	3370		100 U	18900	1 U	10.6		27700	2730000		1250	
MW-20-130	05/05/2006	MW-20-130-098	N	69.2		349000	3900		100 U	20300	1 U	8.95		27700	2810000		1280	
MW-20-130	10/18/2006	MW-20-130-110	N	70		358000	3680			20900		11.5		28000	2870000		1100	
MW-20-130	12/13/2006	MW-20-130-115	N	72.5		335000	3970			19700		10.6		27600	2900000		1250	
MW-20-130	12/13/2006	MW-95-115	FD	72.5		328000	3950			19100		10.5		27300	2830000		1260	
MW-20-130	03/08/2007	MW-20-130-121	N	70		353000	3930			21300		11.3		27000	2760000		1240	
MW-20-130	03/08/2007	MW-90-121	FD	72.5		351000	3900			21300		11.3		26800	2750000		1210	
MW-20-130	05/03/2007	MW-20-130-125	N	75		338000	4020			22500		9.8 J		27800	2550000		1310	
MW-20-130	05/03/2007	MW-95-125	FD	72.5		338000	3950			21900		20.4 J		27300	2550000		1290	
MW-20-130	10/05/2007	MW-20-130-136	N	77		310000	3670		1000 U	19000	1000 U	11.6		31000	2900000		1070	
MW-21	09/01/2000	MW-21_09/01/2000	N	364	0.07 J	569000	3110	2		163000	7.1	1.6935		38200	2410000		3200	0.2 UJ
MW-21	11/30/2001	MW-21_11/30/2001	N	332	0.2 U	518000	2770	2		152000	660	2.68702		21400	2530000		2830	0.2 U
MW-21	06/12/2003	MW-21-006	N	556	0.5 U	432000	2270	2.3	500 U	119000	1040	0.35		24100	2330000		2500	
MW-21	06/08/2004	MW-21-030	N	470	0.1 U	366000	2500	0.1 U	500 U	110000	150	0.9		12000	3250000		2000	0.4 U
MW-21	10/04/2007	MW-21-136	N			417000			20 U	180000	111				3500000			
MW-22	06/15/1998	MW-22_06/15/1998	N	509	7.07	791000	8860			153000	5000	2.9354 J		51400 J	5210000		1400	0.2 J
MW-22	09/01/2000	MW-22_09/01/2000	N	307	3.2 J	886000	10800	2.65		205000	5700	5.1934		73400	6370000		1330	0.2 UJ
MW-22	11/29/2001	MW-22_11/29/2001	N	251	1.4	478000	9970	3.2		97900	3900	6.75142		25600	3600000		1380	0.2 U
MW-22	06/10/2003	MW-22-006	N	383	0.84	584000	10000	2.7	2680	102000	3270	2 U		56300	4870000		1250	
MW-22	06/07/2004	MW-22-030	N	360	1.2	634000	8500	1.4	4130	125000	3900	4 U		27200	6460000		1400	0.4 U
MW-22	06/17/2005	MW-22-070	N	651	4.86	791000	9940	0.5 U	9470	197000	3660	0.5 U		28400	6100000		2190	
MW-22	03/15/2006	MW-22-093	N	357	1.97	816000	10800		5490	184000	5210	0.5 UJ		45100	6660000		1880	
MW-22	10/10/2007	MW-22-136	N			792000	8800		6190	229000	3750	1 U			6080000		2260	
MW-23	06/15/1998	MW-23_06/15/1998	N	265	0.44	675000	6190			73000	4000	2.9354 J		63100 J	3500000		421	1.9

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-23	09/01/2000	MW-23_09/01/2000	N	285	0.4 J	582000	6370	1.8		89700	2200	3.8386		55300	3260000		47	0.2 UJ
MW-23	11/30/2001	MW-23_11/30/2001	N	162	0.62	653000	6210	1.8		79400	1600	3.68054		48700	3490000		491	0.2 U
MW-23	06/12/2003	MW-23-006	N	143	0.5 U	718000	5560	1 U	500 U	77700	1250	0.86		60800	3360000		730	
MW-23	06/08/2004	MW-23-030	N	82	0.1 U	204000	5700	1 U	500 U	77100	480	3.6		28400	989000		690	0.4 U
MW-23	03/08/2006	MW-23-093	N	77.1	0.5 U	743000	5590		500 U	78500	500 U	3.53		40700	3290000		702	
MW-23	10/04/2007	MW-23-136	N			716000			20 U	90200	20 U				3390000			
MW-24A	06/15/1998	MW-24A_06/15/1998	N	146	0.2	89200 J	740			18500 J	71	6.3224		12200	608000		405	0.2 U
MW-24A	09/01/2000	MW-24A_09/01/2000	N	150	0.3 J	73300	806	5.78		15100	0.79 J	4.0644		9600	648000		355	0.2 UJ
MW-24A	11/29/2001	MW-24A_11/29/2001	N	158	0.2 U	60200	880	5.2		11900	0.7 J	3.47732		6100	504000		409	0.2 U
MW-24A	06/12/2003	MW-24-A-006	N	202	0.5 U	67300	754	4.8	500 U	11700	500 U	15.1		12300	700000		310	
MW-24A	06/08/2004	MW-24A-030	N	180	0.1 U	63000	770	4.9	500 U	10600	10 U	15		5880	826000		300	0.4 U
MW-24A	03/06/2006	MW-24A-093	N	288	0.5 U	57700	633		500 U	10600	500 U	15.9		7630	618000		316	
MW-24A	07/18/2007	MW-24A_071807	N	310		42000	410		500 U		5 U	18.3		5610	565000		372	2 U
MW-24B	06/15/1998	MW-24B_06/15/1998	N	62	0.42	231000	3830			8700 J	240 J	3.1612 J		42800 J	2810000		1350	0.1 J
MW-24B	09/01/2000	MW-24B_09/01/2000	N	53	0.09 J	238000	3830	3.5		6600	110	8.8062		49300	2910000		1450	0.2 UJ
MW-24B	11/29/2001	MW-24B_11/29/2001	N	55.4	0.26	224000	3700	3.5		6000	70	6.95464		31400	2830000		1310	0.2 U
MW-24B	06/12/2003	MW-24B-006	N	63.4	0.5 U	213000	3350	2.7	500 U	5870	500 U	15.7		48400	2840000		1270	
MW-24B	06/08/2004	MW-24B-030	N	51	0.1 U	266000	3600	1.8	500 U	5190	50	16		25800	3560000		1300	0.4 U
MW-24B	03/07/2006	MW-24B-093	N	48.8	0.5 U	311000	4080		500 U	7450	500 U	13.8		36400	3220000		1210	
MW-24B	05/04/2006	MW-24B-CIS	N	53.2	0.5 U	296000	4450	2.08	100 U	7750	26.6	11.4		32900	3380000		1260	
MW-24B	05/04/2006	MW-90-CIS	FD	45.3	0.5 U	301000	4380	2.12	100 U	7590	26.4	11.5		32900	3370000		1260	
MW-24B	07/18/2007	MW-24B_071807	N	50		329000	4820		500 U		22.7	12.1		34500	3270000		1060	2 U
MW-24BR	06/15/1998	MW-24BR_06/15/1998	N	2 U	0.46	187000	3980			370	5 U	1.82898		243000 J	3010000		886	0.2 U
MW-24BR	09/01/2000	MW-24BR_09/01/2000	N	40	0.3 J	101000	4830	5.04		2600	140	3.1612		50700	3180000		992	0.2 UJ
MW-24BR	11/29/2001	MW-24BR_11/29/2001	N	93.7	0.2 U	122000	5380	4.4		3900	500	2.55154		31500	3420000		366	0.15 J
MW-24BR	06/13/2003	MW-24BR-006	N	114	0.5 U	110000	4590	5.2	500 U	3550	500 U	2 U		36400	2830000		409	
MW-24BR	06/08/2004	MW-24BR-030	N	50	0.1 U	122000	4600	1.4	500 U	3140	730	4 U		21300	3820000		470	0.5
MW-24BR	03/16/2006	MW-24BR-093	N	129	0.5 U	109000	4430		500 U	3810	500 U	0.5 U		25700	2930000		363	
MW-24BR	10/04/2007	MW-24BR-136	N			126000			20 U	4800	409				3350000			
MW-25	06/15/1999	MW-25_06/15/1999	N	113	1.6	123000	221	1.3		25000	5 U	1.64834		12300	306000		266	0.2 U
MW-25	09/01/2000	MW-25_09/01/2000	N	110	0.08 J	108000	372	1.3		21500	2.1 J	1.33222		12200	268000		267	0.2 UJ
MW-25	11/29/2001	MW-25_11/29/2001	N	132	0.2 U	101000	507	1.2		19400	4 J	1.21932		8400	256000		223	0.2 U
MW-25	06/12/2003	MW-25-006	N	151	0.5 U	92000	346	1.2	500 U	17000	500 U	4.2	8 U	10300	257000		217	
MW-25	06/12/2003	MW-42-006	FD	151	0.5 U	113000	349	1.3	500 U	18900	500 U	4.2		11300	270000		216	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-25	03/03/2004	MW-25-016	N	140		92000	300			18000		4.2		7800	230000		220	
MW-25	05/14/2004	MW-25-026	N	130		89000	310			19000		4.2		8000	230000		210	
MW-25	06/09/2004	MW-25-030	N		0.1 U	108000			500 U	17100	10 U							0.4 U
MW-25	09/22/2004	MW-25-043	N	140		81000	296			16600	500 U	3.93		7400	230000		196	
MW-25	09/22/2004	MW-25-043	N							16000								
MW-25	03/09/2005	MW-25-056	N	158		77600	247		50 U	16100	50 U	3.64		6240	211000		169	
MW-25	06/14/2005	MW-25-070	N	137	0.5 U	93500	289	1.04	100 U	20000	1 U	3.89		8910	253000	2380	183	
MW-25	06/14/2005	MW-93-070	FD	137	0.5 U	100000	294	1.12	100 U	20900	1 U	3.94		9060	268000	2550	185	
MW-25	10/04/2005	MW-25-081	N	141		83300	252		300 U	14900	500 U	3.77		9930	164000		171	
MW-25	10/04/2005	MW-92-081	FD	146		94600	251		300 U	15300	500 U	3.75		10200	185000		171	
MW-25	12/14/2005	MW-25-087	N	153		75500	224		300 U	14500	500 U	3.74		9800	143000		158	
MW-25	12/14/2005	MW-92-087	FD	156		73000	219		300 U	14100	500 U	3.75		9710	151000		155	
MW-25	03/09/2006	MW-25-093	N	170	0.5 U	76400	245		100 U	15600	1 U	3.83		6970	210000		164	
MW-25	05/03/2006	MW-25-098	N	150			272					3.95					172	
MW-25	05/03/2006	MW-25-CIS	N		0.5 U	78000		1	100 U	17300	1 U			7380	222000			
MW-25	05/03/2006	MW-92-098	FD	155		79700	274		100 U	17800	1 U	3.94		7530	245000		173	
MW-25	10/03/2006	MW-25-110	N	163		73300	222			15000		4.09		7250	206000		158	
MW-25	03/06/2007	MW-25-121	N	160		72900	221			14400		3.95		6850	203000		164	
MW-25	10/02/2007	MW-25-136	N	180		66000	189		500 U	14000	500 U	4.58		7900	200000		155	
MW-25	10/02/2007	MW-91-136	FD	190		63000	195		500 U	13000	500 U	4.4		7700	220000		157	
MW-26	06/09/1999	MW-26_06/09/1999	N	110	0.55	210000	877	0.71		54000	300	2.21284		20400	485000		556	0.7
MW-26	09/01/2000	MW-26_09/01/2000	N	139	0.09 J	189000	915	0.57		48900	4.8 J	1.64834		21800	501000		379	0.2 UJ
MW-26	11/30/2001	MW-26_11/30/2001	N	119	0.2 U	178000	901	0.56		47200	120	1.33222		17000	551000		305	0.2 U
MW-26	06/11/2003	MW-26-006	N	138	0.5 U	183000	852	0.32	500 U	47100	500 U	5		14700	528000		423	
MW-26	03/03/2004	MW-26-016	N	110		170000	770			40000		4.6		12000	470000		400	
MW-26	05/14/2004	MW-26-026	N	110		190000	850			50000		5.1		14000	490000		480	
MW-26	06/08/2004	MW-26-030	N		0.1 U													0.4 U
MW-26	06/08/2004	MW-91-030	FD		0.1 U													0.4 U
MW-26	09/22/2004	MW-26-043	N	98		170000	821			46000		5.65		13000	390000		472	
MW-26	12/16/2004	MW-26-049	N	100		176000	835	0.835 J		45700		5		17800	466000		388	
MW-26	03/08/2005	MW-26-056	N	98.7		166000	756			41600		4.48		10700	439000		370	
MW-26	03/08/2005	MW-95-056	FD	96.1		166000	708			40900		4.45		11400	438000		338	
MW-26	06/13/2005	MW-26-070	N	103	0.5 U	178000	847	0.5 U	500 U	44600	500 U	4.9		14000	511000		371	
MW-26	10/04/2005	MW-26-081	N	109		166000	779			40400		4.88		19800	352000		372	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-26	12/12/2005	MW-26-087	N	99.7		162000	788			39900		4.88		20300	349000		372	
MW-26	03/08/2006	MW-26-093	N	121	0.5 U	155000	772		500 U	38100	500 U	4.9		11700	434000 J		324	
MW-26	05/01/2006	MW-26-098	N	121		165000	927			42000		4.87		12800	555000		382	
MW-26	10/03/2006	MW-26-110	N	105		170000	894			43900		6.22		12800	510000		370	
MW-26	03/12/2007	MW-26-121	N	90		163000	917			41600		6.02		12900	621000		387	
MW-26	10/02/2007	MW-26-136	N	100		170000	945		500 U	42000	500 U	7.84		15000	620000		391	
MW-27-20	06/15/1999	MW-27_06/15/1999	N	216	1.1	87400	100	0.57		31800	230	0.2258		5400	113000		217	0.2 U
MW-27-20	09/01/2000	MW-27_09/01/2000	N	291	0.4 J	99000	172	0.68		34600	250	0.13548 J		7200	156000		186	0.2 UJ
MW-27-20	09/01/2000	MW-27D_09/01/2000	FD	278	0.4 J	100000	175	0.68		34500	250	0.18064 J		7100	156000		181	0.2 UJ
MW-27-20	11/29/2001	MW-27_11/29/2001	N	224	0.2 U	97300	206	0.65		31900	360	0.27096		6300	95000		167	0.2 U
MW-27-20	06/10/2003	MW-27-006	N	270	1.3	77100	114	0.46	500 U	24800	500 U	0.2 U	4 U	5570	92800		160	
MW-27-20	02/19/2004	MW-27-WV-014	N						500 U		500 U							
MW-27-20	03/03/2004	MW-27-016	N	180		79000	74			26000		0.4 U		4000	84000		200	
MW-27-20	05/12/2004	MW-27-026	N	170		77000	72			25000		0.4 U		3700	87000		200	
MW-27-20	06/08/2004	MW-27-030	N		1.2								4 U					0.4 U
MW-27-20	09/21/2004	MW-27-043	N	160		76000	77.2			26000		0.2 U		5000	82000		212	
MW-27-20	12/15/2004	MW-27-049	N	169		91500	87.2	0.5 U		32600		0.5 U		4610	88400		236	
MW-27-20	01/10/2005	MW-27-051	N		1.37							0.2 U						
MW-27-20	03/08/2005	MW-27-020-056	N	215		137000	190			56600		0.5 U		4890	195000		432	
MW-27-20	07/18/2005	MW-27-020-074	N	160	0.995	96100	81.9		922	30100	500 U	0.5 U		4270	94800		228	
MW-27-20	10/05/2005	MW-27-020-081	N	175		88600	91.1			31400		0.5 U		5480	81000		252	
MW-27-20	12/14/2005	MW-27-020-087	N	216		116000	118			41800		0.5 U		6960	116000		347	
MW-27-20	03/06/2006	MW-27-020-093	N	385	0.756	89100	89.7		1220	28800	500 U	0.2 U		4900	103000		231	
MW-27-20	06/14/2006	MW-27-020-102	N	195		91100	98.3			28500		0.5 U		2790 J	96900		272	
MW-27-20	10/03/2006	MW-27-020-110	N	160		102000	90.8			34500		0.5 U		6450	113000		261	
MW-27-20	10/02/2007	MW-27-020-136	N	170		97000	102		1200	34000	500 U	1 U		5300	150000		320	
MW-27-60	02/23/2005	MW-27-60-054	N	507 J		452000	3980	5 U	3220	143000	856	0.5 U		25800	2600000		919	
MW-27-60	02/23/2005	MW-91-054	FD	517 J		479000	3890	5 U	3400	151000	904	0.5 U		27900	2830000		879	
MW-27-60	03/14/2005	MW-27-60-057	N	348		417000	4130	12.5 U	3710	133000	895	1 U		22200	2660000		1030	
MW-27-60	07/18/2005	MW-27-060-074	N	325	0.861	354000	3810		2930	114000	500 U	0.5 U		2020000	19900		996	
MW-27-60	03/07/2006	MW-27-060-093	N	393	0.5 U	346000	3380		2620	107000	500 U	0.5 U		19500	2310000		985	
MW-27-60	10/02/2007	MW-27-060-136	N			183000			923	48900	267				1440000			
MW-27-85	02/23/2005	MW-27-85-054	N	311 J		431000	5450	5 U	854	39100	1380	0.5 U		39800	4020000		1190	
MW-27-85	03/14/2005	MW-27-85-057	N	211		417000	5920	12.5 U	720	36800	1060	0.5 U		38600	4020000		1330	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-27-85	07/19/2005	MW-27-085-074	N	328	0.5 U	564000	5690		500 U	153000	1130	0.5 U		36200	3520000		1480	
MW-27-85	03/06/2006	MW-27-085-093	N	355	0.5 U	543000	5340		1890	140000	545	0.5 U		37300	3310000		1420	
MW-27-85	10/02/2007	MW-27-085-136	N			485000			608	145000	233				2870000			
MW-28-25	06/15/1999	MW-28_06/15/1999	N	322	2.1	106000	161	0.05		28100	31	0.47418		6600	207000		386	0.2
MW-28-25	09/01/2000	MW-28_09/01/2000	N	296	1.7 J	129000	269	0.61		36500	240	0.4516		7600	209000		332	0.2 UJ
MW-28-25	11/29/2001	MW-28_11/29/2001	N	266	0.2 U	127000	221	0.57		36000	410	0.27096		6300	165000		273	0.2 U
MW-28-25	06/10/2003	MW-28-006	N	331	1.3	122000	294	0.68	500 U	33200	500 U	0.2 U		6920	254000		250	
MW-28-25	02/20/2004	MW-28-WV-014	N						500 U		500 U							
MW-28-25	03/04/2004	MW-28-016	N	260		120000	220			33000		0.4 U		3800	210000		290	
MW-28-25	05/11/2004	MW-28-026	N	240		110000	110			29000		0.4 U		3900	120000		270	
MW-28-25	06/07/2004	MW-28-25-030	N		0.9		150	0.2				0.4 U	4 U				220	0.4 U
MW-28-25	09/20/2004	MW-28-25-043	N	210		110000	99.1			30000		0.4 U		4600	120000		286	
MW-28-25	12/14/2004	MW-28-25-049	N	202		122000	110	0.629		35700		0.5 U		4780	103000		310	
MW-28-25	03/10/2005	MW-28-025-056	N	204		129000	112			36300		0.5 U		3500	122000		302	
MW-28-25	06/15/2005	MW-28-025-070	N	221	0.5 U	133000	108	0.5 U	500 U	38900	500 U	0.5 U		6540	117000		359	
MW-28-25	10/06/2005	MW-28-025-081	N	197		123000	99.8			37000		0.5 U		6610	88700		300	
MW-28-25	12/16/2005	MW-28-025-087	N	212		134000	128			41500		0.5 U		6460	107000		348	
MW-28-25	03/09/2006	MW-28-025-093	N	244	0.893	98500	84.4		500 U	27500	500 U	0.5 U		4150 J	88500		225	
MW-28-25	05/05/2006	MW-28-025-098	N	216		117000	110			35700		0.5 U		5770	118000		302	
MW-28-25	10/11/2006	MW-28-025-110	N	225		133000	86.3			40800		0.5 U		5470	132000		247	
MW-28-25	10/04/2007	MW-28-025-136	N	230		120000	110		500 U	37000 J	500 U	1 U		4800	150000		307	
MW-28-90	06/10/2004	MW-28-90-030	N	80	0.1 U	186000	2900	1.8	500 U	23800	1800	0.4 U		14200	2190000		590	0.4 U
MW-28-90	12/13/2004	MW-28-90-049	N	97.5		186000	2900	12.5 U		25500				32200 J	1770000		667	
MW-28-90	01/11/2005	MW-28-90-051	N		0.5 U							0.43						
MW-28-90	06/15/2005	MW-28-090-070	N	153	0.5 U	172000	2620	1.79	524	24500	664	0.5 U		13500	2060000		720	
MW-28-90	03/06/2006	MW-28-090-093	N	213	0.5 U	177000	2200		760	27300	500 U	0.5 U		12300	1590000		688	
MW-28-90	10/04/2007	MW-28-090-136	N			128000			772	40200	269				1480000			
MW-29	06/15/1999	MW-29_06/15/1999	N	634	2.1	115000	403	0.86		51700	440	0.47418		11600	442000		395	0.2 U
MW-29	09/01/2000	MW-29_09/01/2000	N	691	2.3 J	110000	418	0.97		54300	350	0.20322 J		14100	450000		286	0.2 UJ
MW-29	11/30/2001	MW-29_11/30/2001	N	980	6.1	397000	1570	1		266000	1200	0.72256		19900	1510000		1780	0.2 U
MW-29	06/11/2003	MW-29-006	N	597	0.89	240000	948	0.42	500 U	143000	819	0.2 U	24 U	12200	900000		1130	
MW-29	05/11/2004	MW-29-026	N	610		110000	460			76000		0.4 U		5900	550000		470	
MW-29	06/09/2004	MW-29-030	N		2.9								8 U					0.4 U
MW-29	04/13/2006	MW-29-093	N	545	3.59	129000	429		1630	98600	500 U	0.5 U		7020	490000		481	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-29	10/04/2007	MW-29-136	N			123000			1180	72900	249				443000			
MW-30-30	06/15/1999	MW-30_06/15/1999	N	649	13.6	854000	11700	1.1		812000	1000	10.161		44800	6680000		2180	0.1 J
MW-30-30	09/01/2000	MW-30_09/01/2000	N	563	3.2 J	889000	15000	1.5		914000	1300	10.3868		100000	8350000		3660	0.2 UJ
MW-30-30	11/29/2001	MW-30_11/29/2001	N	494	0.2 U	991000	22300	1.2		985000	1300	14.40604		56700	8850000		5510	0.2 U
MW-30-30	06/10/2003	MW-30-30-006	N	747	12.3	851000	12100	2 U	500 U	801000	944	2 U		85200	7280000		2800	
MW-30-30	02/19/2004	MW-30-30-WV-014	N						2990		1280							
MW-30-30	03/04/2004	MW-30-30-016	N	570		1000000	19000			1000000		4 U		50000	9600000		4100	
MW-30-30	05/12/2004	MW-30-30-026	N	610		1300000	14000			800000		4 U		47000	8300000		3000	
MW-30-30	06/09/2004	MW-30-30-030	N		11													0.4 U
MW-30-30	09/23/2004	MW-30-30-043	N	570		900000	22000			890000		200 U		76000	11000000		4500	
MW-30-30	12/15/2004	MW-30-30-049	N	458		1300000	19900	12.5 U		1400000		5 U		118000	6110000		4730	
MW-30-30	01/11/2005	MW-30-30-051	N		2.77							10 U						
MW-30-30	03/10/2005	MW-30-030-056	N	421		1590000	16000			1600000		5 U		95400	13600000		4270	
MW-30-30	10/07/2005	MW-30-030-081	N	521		1020000	17600			842000		0.5 U		93600	7650000		4000	
MW-30-30	12/15/2005	MW-30-030-087	N	504		1060000	19700			894000		1 U		110000	8540000		4070	
MW-30-30	03/13/2006	MW-30-030-093	N	650	6.61	1050000	18600		5370	892000	844	0.5 U		77200	11300000		4530	
MW-30-30	05/02/2006	MW-30-030-098	N	756		882000	15400			828000		0.5 U		59400	10280000		3300	
MW-30-30	10/10/2006	MW-30-030-110	N	550		729000	17800			653000		2.5 U		55000	10200000		4400	
MW-30-30	10/08/2007	MW-30-030-136	N	800		650000	13700		4290	540000	482	1 U		56000	9600000		3370	
MW-30-50	06/10/2003	MW-30-50-006	N	159	0.5 U	277000	2810	13.4 U	500 U	89900	500 U	3.7	24 U	23500	1800000		716	
MW-30-50	06/10/2003	MW-43-006	FD	160	0.5 U	267000	2760	13.8 U	500 U	85100	500 U	3.7		23900	1990000		726	
MW-30-50	02/19/2004	MW-30-50-WV-014D	N						500 U									
MW-30-50	02/19/2004	MW-30-50-WV-014D-0.1	FD								952							
MW-30-50	03/05/2004	MW-30-50-016	N	280		280000	3000			120000		1.2		16000	1600000		750	
MW-30-50	03/05/2004	MW-91-016	FD	280		290000	2900			120000		1.2		15000	1600000		730	
MW-30-50	05/14/2004	MW-30-50-026	N	180		270000	2700			100000		3.5		15000	1700000		800	
MW-30-50	05/14/2004	MW-91-026	FD	180		270000	2600			110000		3.5		16000	1700000		800	
MW-30-50	06/09/2004	MW-30-50-030	N		0.7													0.4 U
MW-30-50	06/09/2004	MW-93-030	FD		0.7													0.4 U
MW-30-50	09/23/2004	MW-30-50-043	N	240		290000	3330			100000		1.58		18000	1800000		742	
MW-30-50	09/23/2004	MW-90-043	FD	240		310000	3220			110000		1.64		19000	1900000		694	
MW-30-50	12/15/2004	MW-30-50-049	N	249		378000	3040	5 U		117000		0.5 U		36500	1720000		716	
MW-30-50	12/15/2004	MW-92-049	FD	249		372000	2920	5 U		114000		0.5 U		37800	1700000		725	
MW-30-50	01/11/2005	MW-30-50-051	N		2.07 J							0.28						

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-30-50	01/11/2005	MW-91-051	FD		3.38 J							0.28						
MW-30-50	03/10/2005	MW-30-050-056	N	324		335000	4660			107000		0.5 U		16500	2040000		672	
MW-30-50	10/07/2005	MW-30-050-081	N	252	0.645	438000	3060			101000		0.5 U		37000	1780000		857	
MW-30-50	12/16/2005	MW-30-050-087	N	212		265000	2360			77900		0.5 U		32900	1260000		578	
MW-30-50	03/09/2006	MW-30-050-093	N	275	0.546	226000	2420		500 U	66200	500 U	0.5 U		14600	1640000		651	
MW-30-50	05/02/2006	MW-30-050-098	N	261		243000	2380			70300		0.5 U		16400	1750000		612	
MW-30-50	10/11/2006	MW-30-050-110	N	290		171000	1980			48500		0.5 U		14000	1370000		468	
MW-30-50	10/11/2006	MW-92-110	FD	298		163000	1810			46100		0.5 U		14100	1340000		462	
MW-31-60	06/15/1999	MW-31_06/15/1999	N	75	0.062	186000	816	2.4		28100	25	2.7096		10100	508000		568	0.2 U
MW-31-60	09/01/2000	MW-31_09/01/2000	N	84	0.2 UJ	174000	821	2.6		24000	3 J	1.78382		13500	448000		290	0.2 UJ
MW-31-60	11/29/2001	MW-31_11/29/2001	N	76.7	0.2 U	164000	921	2.8		22700	6.6	1.87414		8900	439000		95.6	0.2 U
MW-31-60	06/11/2003	MW-31-006	N	90.3	0.5 U	176000	760	2	500 U	24400	500 U	5.8		10400	459000		267	
MW-31-60	03/03/2004	MW-31-016	N	72		160000	750			22000		6.2		7900	420000		280	
MW-31-60	05/14/2004	MW-31-60-026	N	74		150000	750			22000		5.5		7500	420000		260	
MW-31-60	06/08/2004	MW-31-60-030	N		0.1 U													0.4 U
MW-31-60	09/22/2004	MW-31-060-043	N	79		130000	691			19000		5.45		7900	430000		236	
MW-31-60	12/16/2004	MW-31-060-049	N	80		118000	691	3.46 J		18500		5.36		9670	421000		246	
MW-31-60	03/09/2005	MW-31-60-056	N	76.6		108000	649		50 U	17300	50 U	4.94		5970	424000		210	
MW-31-60	06/13/2005	MW-31-060-070	N	70	0.5 U	121000	745	2.46	500 U	18900	500 U	4.12		6570	403000		207	
MW-31-60	10/06/2005	MW-31-060-081	N	77.3		109000	691		300 U	16500	500 U	4.01		9750	308000		206	
MW-31-60	12/13/2005	MW-31-060-087	N	73		87000	669			15400		4.14		9320	275000		199	
MW-31-60	03/15/2006	MW-31-060-093	N	89.3	0.5 U	106000	661		500 U	17500	500 U	4.37		7300	403000		191	
MW-31-60	03/15/2006	MW-93-093	FD	81.9	0.5 U	101000	662		500 U	16800	500 U	4.34		6940	391000		192	
MW-31-60	05/01/2006	MW-31-060-098	N	79.6		118000	691			20100		4.58		7780	467000		209	
MW-31-60	10/05/2006	MW-31-060-110	N	80		113000	687			20600		5		9600 J	325000		205	
MW-31-60	03/12/2007	MW-31-060-121	N	72.5		116000	757			20300		4.93		6050	454000		222	
MW-31-60	10/04/2007	MW-31-060-136	N	80		150000	799		500 U	26000	500 U	5.15		7300	580000		208	
MW-31-135	06/10/2004	MW-31-135-030	N	35	0.1 U	338000	3700	3.1	500 U	16500	130	0.7		17000	3400000		530	0.4 U
MW-31-135	06/13/2005	MW-31-135-070	N	32.5	0.5 U	231000	3300	3.17	500 U	14300	500 U	0.953		16200	2170000		482	
MW-31-135	03/15/2006	MW-31-135-093	N	44.7	0.5 U	213000	3070		500 U	13000	500 U	0.8		17000	2010000		486	
MW-31-135	05/01/2007	CIS-012	N	39	0.5 U	230000	3380	4.05	100 U	14500	1 U	0.797		15000	2120000		244	2 U
MW-31-135	10/01/2007	MW-31-135-136	N			206000			20 U	16700	20 U				1980000			
MW-32-20	06/10/2003	MW-32-20-006	N	705	9.5	310000	1980	0.2 U	6080	154000	500 U	0.2 U		21200	867000		17.9	
MW-32-20	02/18/2004	MW-32-20-WV-014	N						4220		579							

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-32-20	03/04/2004	MW-32-20-016	N	570		520000	2900			180000		0.4 U		13000	1500000		540	
MW-32-20	05/12/2004	MW-32-20-026	N	600		510000	2100			180000		0.4 U		16000	1100000		130	
MW-32-20	06/07/2004	MW-32-20-030	N		11													0.4 U
MW-32-20	09/20/2004	MW-32-20-043	N	920		1100000	10200			420000		0.4 U		45000	4900000		3800	
MW-32-20	12/14/2004	MW-32-20-049	N	784		1140000	8890	5 U		400000		5 U		46800	3500000		1990	
MW-32-20	01/10/2005	MW-32-20-051	N		12.3							4 U						
MW-32-20	03/09/2005	MW-32-020-056	N	123		838000	6930			302000		0.5 U		36900	4000000		1660	
MW-32-20	06/17/2005	MW-32-020-070	N	676	9.87	566000	4810	0.5 U	10300	231000	674	0.5 U		23300	2620000		690	
MW-32-20	10/04/2005	MW-32-020-081	N	733		1380000 J	14200			613000 J		5 U		91100 J	5400000 J		2420	
MW-32-20	12/16/2005	MW-32-020-087	N	861		1470000	12200			552000		1 U		90400	4950000		2140	
MW-32-20	03/10/2006	MW-32-020-093	N	432	8.33	1350000	10600		18900	530000	1340	0.5 U		56100	6440000		1970	
MW-32-20	05/04/2006	MW-32-020-098	N	218		937000	9430			445000		0.5 U		46000	4780000		1380	
MW-32-20	10/02/2006	MW-32-020-110	N	660		1870000	20200			1070000		2.5 U		87000	11300000		3190	
MW-32-20	12/11/2006	MW-32-020-115	N	825		1530000	17900			785000		5 U		81700	8420000		3020	
MW-32-20	03/06/2007	MW-32-020-121	N	765		1460000	16200			635000		0.925		64400	7110000		2210	
MW-32-20	04/30/2007	MW-32-020-125	N	770		965000	9820			484000		0.2 U		51400	5520000		1310	
MW-32-20	10/01/2007	MW-32-020-136	N	700		1800000	20600		21000	1100000	2000 U	1 U		93000	9900000		3160	
MW-32-35	06/10/2003	MW-32-35-006	N	376	1.9	325000	2320	0.2 U	2250	89600	1280	0.2 U		20900	1140000		421	
MW-32-35	02/18/2004	MW-32-35-WV-014	N						2440		1360							
MW-32-35	03/04/2004	MW-32-35-016	N	310		340000	1900			99000		0.4 U		13000	1100000		470	
MW-32-35	05/12/2004	MW-32-35-026	N	320		330000	1900			94000		0.4 U		12000	1100000		460	
MW-32-35	06/08/2004	MW-32-35-030	N		2.9													0.4 U
MW-32-35	09/21/2004	MW-32-35-043	N	310		320000	2150			89000		0.2 U		14000	990000		422	
MW-32-35	12/15/2004	MW-32-35-049	N	276		351000	1760	5 U		96300		0.5 U		24700 J	954000		524	
MW-32-35	01/10/2005	MW-32-35-051	N		2.54							0.2 U						
MW-32-35	03/09/2005	MW-32-035-056	N	260		312000	1770			85500		0.5 U		13000	944000		465	
MW-32-35	06/17/2005	MW-32-035-070	N	223	2.52	506000	3520	0.5 U	6670	120000	1730	0.5 U		14800	2110000		787	
MW-32-35	10/04/2005	MW-32-035-081	N	208		567000	3840			134000		0.5 U		29300	1530000		765	
MW-32-35	12/16/2005	MW-32-035-087	N	219		606000	3510			128000		1 U		30000	1580000		710	
MW-32-35	03/10/2006	MW-32-035-093	N	234	2.13	654000	4210		6460	129000	1730	0.5 U		19200	2360000		1010	
MW-32-35	05/04/2006	MW-32-035-098	N	218		693000	4960			148000		0.5 U		19500	2800000		1130	
MW-32-35	10/02/2006	MW-32-035-110	N	290		839000	5430			165000		2.5 U		23900	3260000		1050	
MW-32-35	12/11/2006	MW-32-035-115	N	338		845000	5090			173000		0.5 U		22500	2620000		1000	
MW-32-35	03/06/2007	MW-32-035-121	N	360		1080000	6070			209000		0.5 U		23500	2910000		1200	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-32-35	04/30/2007	MW-32-035-125	N	475		1250000	6610			273000		0.2 U		26200	3280000		1280	
MW-32-35	10/01/2007	MW-32-035-136	N	490		1000000	6830		16000	390000	4300	1 U		29000	4000000		1120	
MW-33-40	06/11/2003	MW-33-40-006	N	184	0.5 U	7740	1030	8.2	500 U	4210	500 U	0.57	20 U	3340	846000		233	
MW-33-40	02/19/2004	MW-33-40-WV-014	N						500 U		500 U							
MW-33-40	06/09/2004	MW-33-40-030	N	180	0.1 U	9930			500 U	6540	20			1100	1140000			0.4 U
MW-33-40	08/19/2004	MW-33-40-040	N				2200 J	8.6				0.4 U					780	
MW-33-40	01/11/2005	MW-33-40-051	N		0.5 U							0.21						
MW-33-40	06/17/2005	MW-33-040-070	N	200	0.5 U	13600	1410	8.78	500 U	10100	500 U	0.5 U		2030	977000		369	
MW-33-40	03/09/2006	MW-33-040-093	N	262	0.5 U	15700	1340		500 U	10900	500 U	0.5 U		2390 J	1180000		373	
MW-33-40	10/05/2007	MW-33-040-136	N			31200			25.7	29400	20 U				1570000			
MW-33-90	06/11/2003	MW-33-90-006	N	75.6	0.5 U	233000	2590	3.4	500 U	25000	500 U	0.2 U		19800	1610000		394	
MW-33-90	02/17/2004	MW-33-90-WV-014	N						500 U		500 U							
MW-33-90	06/10/2004	MW-33-90-030	N	55	0.1 U	272000	2400	2.7	500 U	23800	30	1		10600	1760000		400	0.4 U
MW-33-90	01/11/2005	MW-33-90-051	N		0.5 U							1.1						
MW-33-90	06/16/2005	MW-33-090-070	N	50.1	0.5 U	243000	2690	3.13	500 U	27500	500 U	0.975		13700	1830000		394	
MW-33-90	06/16/2005	MW-95-070	FD	52.6	0.5 U	245000	2650	3.1	500 U	27200	500 U	0.972		12800	1810000		396	
MW-33-90	03/08/2006	MW-33-090-093	N	54	0.5 U	287000	2770		500 U	31700	500 U	1.04		16100	1580000		465	
MW-33-90	05/03/2006	MW-33-090-CIS	N	55.9	0.5 U	323000	3020	1.79	100 U	37200	2.11	1.09		14900	1900000		496	
MW-33-90	10/05/2007	MW-33-090-136	N			281000			20 U	39500	20 U				1720000			
MW-33-150	03/02/2005	MW-33-150-055	N	50.9		421000	5430	5 U	500 U	51300	500 U	1.03		25800	2820000		666	
MW-33-150	03/02/2005	MW-91-055	FD	48.4		430000	5330	5 U	500 U	50500	500 U	0.975		24700	2580000		683	
MW-33-150	03/16/2005	MW-33-150-057	N	52.8		468000	5780	1 UJ	500 U	59100	754	1 U		26300	3510000		732	
MW-33-150	06/17/2005	MW-33-150-070	N	45	0.5 U	416000	5380	0.5 UJ	500 U	45800	500 U	0.992		25000	3470000		709	
MW-33-150	03/08/2006	MW-33-150-093	N	59.1	0.5 U	433000	5490		500 U	47600	500 U	1.05		26500	3210000		860	
MW-33-150	10/09/2007	MW-33-150-136	N			487000	5520		20 U	58500	32	1.41			3200000		781	
MW-33-150	10/09/2007	MW-96-136	FD			490000	5520		20 U	59700	35.8	1.26			3110000		780	
MW-33-210	02/24/2005	MW-33-210-054	N	60.6		532000	6480	5 U	500 U	79900	500 U	1.07		40500	3820000		998	
MW-33-210	03/16/2005	MW-33-210-057	N	55.3		538000	6210	1 UJ	500 U	66600	500 U	1.19		43800	4000000		1030	
MW-33-210	06/16/2005	MW-33-210-070	N	65.1	0.5 U	571000	6450	0.5 U	500 U	99100	500 U	1.26		28800	4290000		1060	
MW-33-210	03/06/2006	MW-33-210-093	N	64.2	0.5 U	541000	6270		500 U	75300	500 U	1.86		39400	3570000		1060	
MW-33-210	05/05/2006	MW-33-210-CIS	N	63.9	0.5 U	633000	6250	0.5 U	100 U	92000	82.2	1.05		35100	3980000		1300	
MW-33-210	10/05/2007	MW-33-210-136	N			580000			20 U	87900	27.9				3780000			
MW-34-55	06/16/2003	MW-34-55-006-AT	N	334	1.2	377000	2740	1.3	2680	95900	500 U	0.2 U		30000	1750000		821	
MW-34-55	02/18/2004	MW-34-55-WV-014	N						500 U		500 U							

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-34-55	03/04/2004	MW-34-55-016	N	270		360000	3200			97000		0.4 U		13000	2000000		850	
MW-34-55	05/13/2004	MW-34-55-026	N	270		310000	2700			77000		0.4 U		15000	1900000		770	
MW-34-55	06/08/2004	MW-34-55-030	N		1	246000			500 U	68300	290		20 U					0.4 U
MW-34-55	09/22/2004	MW-34-55-043	N	250		260000	2700			85200	500 U	0.2 U		17000	1800000		732	
MW-34-55	09/22/2004	MW-34-55-043	N							66000								
MW-34-55	12/15/2004	MW-34-55-049	N	234		288000	2390	5 U	300 U	69900	234	0.5 U		33000	1430000		743	
MW-34-55	12/15/2004	MW-34-55-049	N			241000				58100				23200	1540000			
MW-34-55	01/12/2005	MW-34-55-051	N		1.14							0.2 U						
MW-34-55	03/10/2005	MW-34-055-056	N	240		282000	2620			71300		0.5 U		17700	1900000		739	
MW-34-55	03/10/2005	MW-34-55-056	N			366000			82.5	66900	264			29100	1450000			
MW-34-55	07/15/2005	MW-34-055-074	N	242	0.695	247000	2250	0.5 U	500 U	52000	500 U	0.5 U		16500	1420000		607	
MW-34-55	10/05/2005	MW-34-055-081	N	232		272000	2170		470	59100	500 U	0.5 U		25800	1230000		619	
MW-34-55	12/14/2005	MW-34-055-087	N	236		217000	2150		505	45000	500 U	0.5 U		27200	965000		552	
MW-34-55	03/08/2006	MW-34-055-093	N	272	0.5 U	256000	2080		239	54200	215	0.5 U		13500	1640000		593	
MW-34-55	05/03/2006	MW-34-055-098	N	302		198000	2070		188	44800	165	0.5 U		11100	1360000		500	
MW-34-55	10/04/2006	MW-34-055-110	N	368		37600	443			8080		0.5 U		4590	536000		230	
MW-34-55	10/03/2007	MW-34-055-136	N	190		15000	109		500 U	3300	500 U	1 U		3300	290000		266	
MW-34-80	06/16/2003	MW-34-80-006-AT	N	332	0.5 U	404000	3830	1.4	500 U	58900	810	1 U		43100	2430000		1000	
MW-34-80	02/18/2004	MW-34-80-WV-014	N						500 U									
MW-34-80	03/05/2004	MW-34-80-016	N	180		280000	4700			24000		0.4 U		25000	2600000		1000	
MW-34-80	05/13/2004	MW-34-80-026	N	270		390000	3900			54000		4 U		27000	2800000		1000	
MW-34-80	05/13/2004	MW-92-026	FD	280		390000	4000			53000		4 U		27000	2700000		1000	
MW-34-80	06/08/2004	MW-34-80-030	N		0.1 U	396000			500 U	56600	300		40 U					0.4 U
MW-34-80	09/23/2004	MW-34-80-043	N	290		410000	4050			76000	500 U	10 U		32000	2800000		997	
MW-34-80	09/23/2004	MW-34-80-043	N							61000								
MW-34-80	09/23/2004	MW-97-043	FD	290		410000	4170			61000	500 U	10 U		35000	2800000		998	
MW-34-80	09/23/2004	MW-97-043	FD							84300								
MW-34-80	12/13/2004	MW-34-80-049	N			455000			300 U	55000	261			40400	2220000			
MW-34-80	01/12/2005	MW-34-80-051	N		0.5 U							0.2 U						
MW-34-80	03/08/2005	MW-34-080-056	N	304		439000	4180		147	68100	293	0.5 U		28000	2750000		1040	
MW-34-80	03/15/2005	MW-34-080-057	N	288		445000	3920	1 U	500 U	65700	500 U	1 U		29700	2990000		5 U	
MW-34-80	06/30/2005	MW-34-080-070	N	302	0.5 U	497000	3910	0.5 U	172	76500	233	0.5 U		27700	2670000	17500	979	
MW-34-80	10/05/2005	MW-34-080-081	N	302		429000	3880		300 U	72500	500 U	0.5 U		47400	1660000		1060	
MW-34-80	12/14/2005	MW-34-080-087	N	297		432000	3700		300 U	68300	500 U	0.5 U		54900	1710000		880	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-34-80	03/09/2006	MW-34-080-093	N	313	0.5 U	383000	3520		100 U	65800	136	0.5 U		24000	2420000		986	
MW-34-80	05/03/2006	MW-34-080-098	N	297		425000	3700		100 U	70300	119	0.5 U		23900	2480000		921	
MW-34-80	10/04/2006	MW-34-080-110	N	268		341000	3210			65400		0.5 U		21100	2170000		786	
MW-34-80	12/12/2006	MW-34-080-115	N	288		298000	3190			62900		0.5 U		18900	2040000		789	
MW-34-80	03/05/2007	MW-34-080-121	N	205		315000	3300			68300		0.5 U		19400	2020000		783	
MW-34-80	04/30/2007	MW-34-080-125	N	245		282000	3320 J			57000		0.2 U		18600	2080000		889 J	
MW-34-80	10/03/2007	MW-34-080-136	N	240		220000	2630		500 U	53000	500 U	1 U		21000	2000000		696	
MW-34-100	02/23/2005	MW-34-100-054	N	273 J		230000	4780	5 U	500 U	18000	500 U	0.786		37600	3580000		1140	
MW-34-100	03/14/2005	MW-34-100-057	N	175		221000	5010	12.5 U	500 U	17400	500 U	1 U		34100	3600000		1210	
MW-34-100	06/21/2005	MW-34-100-070	N	179	0.5 U	229000	5350		500 U	17400	500 U	1.05		27100	3510000		1270	
MW-34-100	06/21/2005	MW-96-070	FD	179	0.5 U	243000	4920		500 U	18200	500 U	1.03		32100	3740000		1180	
MW-34-100	10/05/2005	MW-34-100-081	N	172	0.5 U	171000	4530			13800		1.2		55200	2450000		1150	
MW-34-100	10/05/2005	MW-93-081	FD	172	0.5 U	228000	4680			14100		1.21		50900	2730000		1200	
MW-34-100	12/14/2005	MW-34-100-087	N			226000				14900				62900	2530000			
MW-34-100	12/14/2005	MW-93-087	FD			220000				15100				64200	2530000			
MW-34-100	03/08/2006	MW-34-100-093	N	152	0.5 U	179000	4720		500 U	12100	500 U	1.39		32500	3580000		1180	
MW-34-100	03/08/2006	MW-94-093	FD	159	0.5 U	182000	4920		500 U	11900	500 U	1.39		36500	3530000		1220	
MW-34-100	05/03/2006	MW-34-100-CIS	N	133	0.5 U	162000	5060	0.527	100 U	12000	56.7	1.34		31100	3890000		1200	
MW-34-100	05/03/2006	MW-91-CIS	FD	136	0.5 U	166000	5170	0.643	100 U	12200	57.2	1.33		31300	3900000		1230	
MW-34-100	04/30/2007	CIS-004	N	123	0.5 U	186000	5920	1.78	100 U	12000	26.7	1.38		31500	3840000		1040	2 U
MW-34-100	04/30/2007	CIS-096	FD	123	0.5 U	189000	5880	1.72	100 U	12000	27.8	1.37		32100	3920000		1050	2 U
MW-34-100	10/03/2007	MW-34-100-136	N	120		170000	5350		2500 U	11000	2500 U	1.19		44000	4300000		970	
MW-34-100	10/03/2007	MW-93-136	FD	120		160000	5360		2500 U	10000	2500 U	1.03		43000	4300000		953	
MW-35-60	06/10/2004	MW-35-60-030	N	76	0.1 U	294000	1700	1.5	500 U	36200	30	1.8		11200	1140000		270	0.4 U
MW-35-60	06/13/2005	MW-35-060-070	N	70	0.5 U	290000	1880	1.75	500 U	37800	500 U	2		13500	1220000		367	
MW-35-60	03/14/2006	MW-35-060-093	N	74.5	0.5 U	305000	2070		500 U	40600	500 U	1.93		16600	1270000		342	
MW-35-60	05/02/2006	MW-35-060-CIS	N	76.2	0.5 U	297000	2110	1.92	100 U	40500	1 U	1.93		12600	1180000		353	
MW-35-60	10/01/2007	MW-35-060-136	N			291000			20 U	44200	20 U				1310000			
MW-35-135	06/10/2004	MW-35-135-030	N	50	0.1 U	434000	3200	1.3	500 U	47600	230	2		16600	2750000		940	0.4 U
MW-35-135	06/13/2005	MW-35-135-070	N	42.5	0.5 U	373000	3360	0.5 U	500 U	45700	500 U	2.19		15200	2140000		953	
MW-35-135	03/10/2006	MW-35-135-093	N	64.2	0.5 U	254000	2930		500 U	30900	500 U	2.41		13600	2050000		669	
MW-35-135	03/10/2006	MW-95-093	FD	54	0.5 U	241000	2910		500 U	29900	500 U	2.46		12000	1960000		630	
MW-35-135	05/02/2006	MW-35-135-CIS	N	49	0.5 U	339000	3160	1.76	100 U	41000	2.23	2.25		14300	2240000		805	
MW-35-135	05/04/2007	CIS-027	N	52.5	0.5 U	316000	3360	1.95	100 U	36900	2.76	2.39		13800	2200000		854	2 U

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-35-135	05/04/2007	CIS-085	FD	52.5	0.5 U	301000	3330	1.92	100 U	35700	1 U	2.38		13100	2100000		856	2 U
MW-35-135	10/01/2007	MW-35-135-136	N			208000			20 U	30600	20 U				1820000			
MW-36-20	06/15/2004	MW-36-20-031	N	270	1.7	406000	2900	2.1	500 U	69900	500 U	0.4 U		27100	1410000		660	0.4 U
MW-36-20	01/11/2005	MW-36-020-051	N		1.98							10 U						
MW-36-20	10/03/2005	MW-36-020-081	N	330	0.5 U	433000	4580	1.21		116000		0.5 U		26100	2040000		1180	
MW-36-20	12/15/2005	MW-36-020-087	N			787000				293000				34600	5250000			
MW-36-20	03/07/2006	MW-36-020-093	N	375	1.71	372000	3890		1830	98300	500 U	0.5 U		14900	2780000		1040	
MW-36-20	05/01/2006	MW-36-020-098	N			542000				152000				18000	3750000			
MW-36-20	10/03/2007	MW-36-020-136	N			224000			2750	219000	642				5120000			
MW-36-40	06/16/2004	MW-36-40-031	N	230	1.7	402000	2500	2.1	500 U	55500	511	0.4 U		24500	1260000		640	0.4 U
MW-36-40	03/07/2006	MW-36-040-093	N	370	1.21	363000	3440		3920	86400	699	0.5 U		17600	2430000		1050	
MW-36-40	10/03/2007	MW-36-040-136	N			126000			2630	104000	536				1820000			
MW-36-50	06/17/2004	MW-36-50-031	N	190	0.5	297000	2400	2	500 U	57100	723	0.4 U		29800	1140000		590	0.4 U
MW-36-50	01/12/2005	MW-36-50-051	N		0.5 U							0.2 U						
MW-36-50	03/07/2006	MW-36-050-093	N	278	0.5 U	200000	1870		570	39700	517	0.5 U		11500	1430000		532	
MW-36-50	03/07/2006	MW-96-093	FD	275	0.5 U	191000	1880		553	38500	500 U	0.5 U		10900	1370000		533	
MW-36-50	10/10/2007	MW-36-050-136	N			92200	623		246	20100	267	1 U			653000		448	
MW-36-70	06/17/2004	MW-36-70-031	N	270	0.9	448000	3600	1.7	500 U	94900	2490	0.4 U		47800	1420000		840	0.4 U
MW-36-70	10/03/2005	MW-36-070-081	N	218	0.558	341000	2510	1.37		72600		0.5 U		32800	1450000		748	
MW-36-70	12/15/2005	MW-36-070-087	N			258000				48300				26400	1200000			
MW-36-70	03/07/2006	MW-36-070-093	N	267	0.5 U	223000	2190		500 U	51100	508	0.5 U		15300	1710000		664	
MW-36-70	05/01/2006	MW-36-070-098	N			229000				49100				13900	1640000			
MW-36-70	10/09/2007	MW-36-070-136	N			14700	188		20 U	3010	23.6	1 U			354000		298	
MW-36-90	06/15/2004	MW-36-90-031	N	95	0.1 U	512000	4400	2.5	500 U	25400	500 U	2.5		62900	2410000		990	0.4 U
MW-36-90	03/07/2006	MW-36-090-093	N	244	0.5 U	212000	2940		500 U	16100	500 U	0.5 U		20600	2240000		871	
MW-36-90	10/09/2007	MW-36-090-136	N			40700	717		20 U	4610	20.6	1 U			718000		364	
MW-36-100	06/15/2004	MW-36-100-031	N	75	0.1 U	500000	4500	2.8	500 U	21000	949	2.8		66800	2470000		990	0.4 U
MW-36-100	07/19/2005	MW-36-100-074	N			381000			500 U	26900	500 U			29300	3330000			
MW-36-100	10/05/2005	MW-36-100-081	N	215	0.5 U	390000	4800			23300		0.5 U		46700	2460000		1230	
MW-36-100	03/13/2006	MW-36-100-093	N	196	0.5 U	413000	4660		500 U	30600	500 U	0.572		24000	3050000		1180	
MW-36-100	10/10/2007	MW-36-100-136	N			602000	4140		170	47900	147	1 U			2550000		1080	
MW-37D	06/11/2004	MW-37D-030	N	46	0.1 U	384000	3800	2.6	500 U	19100	90	2.1		16900	3650000		620	0.4 U
MW-37D	09/24/2004	MW-37D-043	N							20800	500 U							
MW-37D	09/24/2004	MW-92-043	FD							20200	500 U							

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-37D	12/14/2004	MW-37D-049	N			387000			300 U	19100	50 U			42700	2180000			
MW-37D	12/14/2004	MW-95-049	FD			364000			300 U	18800	50 U			35400	2230000			
MW-37D	03/11/2005	MW-37D-056	N			350000			50 U	21900	50 U			56100	2600000			
MW-37D	06/15/2005	MW-37D-070	N			428000			100 U	27400	5.62			24600	3450000	14000		
MW-37D	03/13/2006	MW-37D-093	N	57.1	0.5 U	341000	4620		100 U	22400	1.14	3.88		19900	2980000		766	
MW-37D	05/03/2006	MW-37D-CIS	N	42.6	0.5 U	401000 J	4770	1.11	100 U	23700 J	1 U	3.55		21700 J	3130000 J		808	
MW-37D	10/04/2007	MW-37D-136	N			162000			20 U	12700	20 U				1320000			
MW-37S	06/10/2004	MW-37S-030	N	69	0.1 U	144000	1100	2.4	500 U	19900	220	1.3		8630	701000		210	0.4 U
MW-37S	03/13/2006	MW-37S-093	N	59.6	0.5 U	135000	1250		500 U	18200	500 U	1.74		9800	741000		236	
MW-37S	05/04/2006	MW-37S-CIS	N	61.2	0.5 U	133000	1330	2.15	100 U	20200	1 U	1.43		9510	885000		248	
MW-37S	05/04/2006	MW-94-098	FD			136000				19200				9040	770000			
MW-37S	10/04/2007	MW-37S-136	N			132000			20 U	23600	20 U				912000			
MW-38D	06/10/2004	MW-38D-030	N	33	0.1	392000	6500	3	500 U	6440	90	1.3		36000	5790000		750	0.4 U
MW-38D	03/10/2006	MW-38D-093	N	36	0.5 U	358000	6870		500 U	7330	500 U	0.847		48600	4950000		689	
MW-38D	05/03/2007	CIS-017	N	32	1 U	351000	7510	4.58	100 U	8510	4.79	14.7		44100	4760000		760	2 U
MW-38D	07/17/2007	MW-38D_071707	N	35		352000	7240		500 U		10.4	0.697		45600	4710000		724	2 U
MW-38S	06/11/2004	MW-38S-030	N	210	0.1	154000	770	6.9	500 U	21500	120	9.7		9470	860000		500	0.4 U
MW-38S	03/10/2006	MW-38S-093	N	193	0.5 U	120000	775		500 U	22700	500 U	10.3		10100	710000		512	
MW-38S	05/04/2006	MW-38S-CIS	N	173	0.5 U	110000	852	6.45	100 U	22600	3.76	8.73		9690	770000		523	
MW-38S	07/17/2007	MW-38S_071707	N	175		84200	680		500 U		5 U	10.5		8710	627000		465	2 U
MW-39-40	06/18/2004	MW-39-40-031	N	140	1.3	232000	1400	3	500 U	16800	500 U	0.4 UJ		26700	808000		580	0.4 U
MW-39-40	01/12/2005	MW-39-40-051	N		1.19							0.2 U						
MW-39-40	06/16/2005	MW-39-040-070	N	175	0.721	214000	1500	2.56	1430	41300	570	0.5 U		13400	874000		536	
MW-39-40	03/07/2006	MW-39-040-093	N	262	0.538	271000	1900		2200	57000	815	0.5 U		14800	1320000		488	
MW-39-40	10/08/2007	MW-39-040-136	N			425000	3600		12400	163000	1590	1 UJ			2460000		446	
MW-39-50	06/18/2004	MW-39-50-031	N	91	0.1 U	295000	1800	2.8	500 U	38000	500 U	6.3 J		23600	824000		780	0.4 U
MW-39-50	03/08/2006	MW-39-050-093	N	275	0.5 U	270000	3190		500 U	99100	500 U	0.5 U		17100	2130000		810	
MW-39-50	10/08/2007	MW-39-050-136	N			50800	865		31.1	19400	72.1	1 UJ			809000		385	
MW-39-60	06/18/2004	MW-39-60-031	N	83	0.2	270000	1700	2.8	500 U	34800	500 U	6.3 J		23400	778000		790	0.4 U
MW-39-60	06/18/2004	MW-91-031	FD	83	0.2	269000	1700	2.8	500 U	38000	500 U	6.2 J		23900	689000		790	0.4 U
MW-39-60	03/08/2006	MW-39-060-093	N	288	0.5 U	479000	4130		500 U	124000	500 U	0.5 U		22500	2540000		1070	
MW-39-60	03/08/2006	MW-97-093	FD	278	0.5 U	495000	4270		500 U	127000	500 U	0.5 U		25200	2610000		1090	
MW-39-60	05/02/2006	MW-39-060-CIS	N	256	0.5 U	372000	3510	2.5	100 U	100000	105	0.5 U		18200	2490000		843	
MW-39-60	10/08/2007	MW-39-060-136	N			55500	1170		28.5	24600	34.6	1 UJ			1020000		440	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-39-70	06/18/2004	MW-39-70-031	N	76	0.1 U	425000	2400	2.7	500 U	36500	500 U	9 J		35700	1390000		920	0.4 U
MW-39-70	06/16/2005	MW-39-070-070	N	223	0.5 U	495000	3800	0.888	500 U	65800	500 U	0.5 U		22000	2550000		919	
MW-39-70	03/08/2006	MW-39-070-093	N	254	0.5 U	427000	3260		500 U	66100	500 U	0.5 U		21200	2070000		919	
MW-39-70	10/08/2007	MW-39-070-136	N			126000	1440		121	31300	20 U	1 UJ			1190000		494	
MW-39-80	06/17/2004	MW-39-80-031	N	74	0.1 U	441000	3000	2.3	500 U	35600	500 U	8.9		42900	1510000		1100	0.4 U
MW-39-80	01/14/2005	MW-39-080-051	N		0.5 U							7.97						
MW-39-80	03/08/2006	MW-39-080-093	N	211	0.5 U	592000	4320		500 U	65000	500 U	0.931		29500	2430000		1140	
MW-39-80	10/08/2007	MW-39-080-136	N			474000	3780		20 U	93600	20 U	1 UJ			2470000		944	
MW-39-100	06/15/2004	MW-39-100-031	N	58	0.1 U	577000	4100	2.4	500 U	22700	500 U	9.8		68500	2430000		1400	0.4 U
MW-39-100	06/15/2004	MW-90-031	FD	58	0.1 U	584000	4100	2.3	500 U	24300	500 U	9.4		69600	2030000		1400	0.4 U
MW-39-100	06/17/2005	MW-39-100-070	N	77	0.5 U	523000	5820	0.5 U	500 U	32300	500 U	4.23		34100	3440000		1510	
MW-39-100	03/13/2006	MW-39-100-093	N	132	0.5 U	650000	5610		500 U	43400	500 U	2.68		47300	3410000		1440	
MW-39-100	10/10/2007	MW-39-100-136	N			678000	6730		56	55300	20 U	1 U			3700000		1610	
MW-40D	06/14/2004	MW-40D-031	N	57	0.1 U	461000	4300	2.1	500 U	40200	630	1		50500	2290000		540	0.4 U
MW-40D	03/08/2006	MW-40D-093	N	54	0.5 U	394000	5080		500 U	48200	500 U	2.35		30500	3130000		765	
MW-40D	05/04/2007	CIS-005	N	51	0.5 U	375000	5280	2.79	100 U	45400	123	19.7		25700	3310000		682	2 U
MW-40D	10/04/2007	MW-40D-136	N			391000			20 U	58800	20 U				3450000			
MW-40S	06/15/2004	MW-40S-031	N	81	0.1 U	115000	460	2.4	500 U	16600	500 U	6.6		12000	256000		160	0.4 U
MW-40S	03/08/2006	MW-40S-093	N	79.7	0.5 U	102000	453		500 U	18300	500 U	6.38		7280 U	250000 J		143	
MW-40S	05/03/2006	MW-40S-CIS	N	71.9	0.5 U	93400	523	2.55	100 U	19200	1.38	4.6		7310	299000		158	
MW-40S	10/04/2007	MW-40S-136	N			110000			20 U	24700	20 U				321000			
MW-41D	12/15/2004	MW-41D-049	N	42.3	0.5 U	365000	6910	5 U		30200		0.5 U		74500	2910000		713	2 U
MW-41D	06/14/2005	MW-41D-070	N	38.2	0.5 U	366000	7220	0.5 U	500 U	30800	500 U	0.5 U		31700	4450000		758	
MW-41D	03/15/2006	MW-41D-093	N	42.2	0.5 U	404000	7120		500 U	33900	500 U	0.5 U		34300	4390000		840	
MW-41D	10/03/2007	MW-41D-136	N			129000			120	22200	101				384000			
MW-41M	12/15/2004	MW-41M-049	N	37.3	0.5 U	388000	4520	5 U		32900		0.638		49900	2200000		524	2 U
MW-41M	03/13/2006	MW-41M-093	N	44.7	0.5 U	440000	4630		500 U	37200	500 U	0.702		24200	2710000		615	
MW-41M	10/03/2007	MW-41M-136	N			399000			39	46600	20 U				3280000			
MW-41S	12/16/2004	MW-41S-049	N	52.5	0.5 U	105000	1400	4.6 J		15400		1.33		15400	844000		282	2 U
MW-41S	06/14/2005	MW-41S-070	N	56	0.5 U	103000	732	1.86	500 U	15300	500 U	1.3		8790	787000		250	
MW-41S	03/13/2006	MW-41S-093	N	59.6	0.5 U	99700	1330		500 U	13500	500 U	1.32		10100	807000		261	
MW-41S	10/03/2007	MW-41S-136	N			77500			24.5	16000	20 U				793000			
MW-42-30	02/23/2005	MW-42-30-054	N	442 J		557000	3330	5 U	4350	170000	1090	0.5 U		18900	2050000		845	
MW-42-30	03/16/2005	MW-42-030-057	N	319		561000	4220 J	1 UJ	2430	184000	994	1 U		18500	2330000		997	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-42-30	10/07/2005	MW-42-030-081	N	250	3.94	698000	4930			178000		0.5 U		41200	2080000		1170	
MW-42-30	12/15/2005	MW-42-030-087	N			74100				195000				34600	254000			
MW-42-30	03/07/2006	MW-42-030-093	N	188	2.03	436000	2820		2750	93400	672	0.5 U		17400	1800000		986	
MW-42-30	10/04/2007	MW-42-030-136	N			812000			5390	287000	737				4600000			
MW-42-55	02/23/2005	MW-42-55-054	N	219 J		559000	3600	5 U	2110	108000	776	0.5 U		30800	2340000		967	
MW-42-55	03/16/2005	MW-42-055-057	N	209		686000	4970	1 UJ	1950	135000	1300	1 U		32600	3050000		1220	
MW-42-55	10/07/2005	MW-42-055-081	N	250	0.5 U	1040000	5510			169000		0.5 U		55700	2320000		1290	
MW-42-55	12/15/2005	MW-42-055-087	N			784000				124000				47300	1900000			
MW-42-55	03/07/2006	MW-42-055-093	N	326	0.5 U	655000	4340		2490	128000	943	0.5 U		29300	2730000		1050	
MW-42-55	10/04/2007	MW-42-055-136	N			183000			20 U	13100	20 U				4000000			
MW-42-65	02/24/2005	MW-42-065-054	N	209		723000	4960	5 U	2200	145000	2330	0.5 U		36700	3080000		1190	
MW-42-65	03/16/2005	MW-42-065-057	N	163		511000	3970	1 UJ	2010	95500	769	1 U		27000	2340000		1070	
MW-42-65	10/07/2005	MW-42-065-081	N	262	0.5 U	909000	5100			175000		0.5 U		61100	2620000		1260	
MW-42-65	12/15/2005	MW-42-065-087	N			778000				157000				49800	2260000			
MW-42-65	03/07/2006	MW-42-065-093	N	321	0.5 U	600000	5260		1090	189000	500 U	0.5 U		34300	3260000		1410	
MW-42-65	10/03/2007	MW-42-065-136	N			432000			360	210000	1720				3060000			
MW-43-25	03/07/2005	MW-43-025-055	N	298			109	0.63	3480	46100	558	0.2 U					368	
MW-43-25	03/15/2005	MW-43-025-057	N	206		112000	107	1 U	2200	48600	519	1 U		8640	117000		361	
MW-43-25	06/20/2005	MW-43-025-070	N	258	1.57	118000	114		4730	49600	504	0.5 U		6750	131000		380	
MW-43-25	03/10/2006	MW-43-025-093	N	252	1.93	97500	107		3270	41000	500 U	0.5 U		5700	125000		298	
MW-43-25	10/02/2007	MW-43-025-136	N			87200			3370	40900	277				134000			
MW-43-75	03/07/2005	MW-43-075-055	N	611			3670	1.56	3720	92200	463	0.2 U					1520	
MW-43-75	03/15/2005	MW-43-075-057	N	505		446000	3900	1 U	3830	88100	500 U	1 U		27900	2840000		1540	
MW-43-75	06/20/2005	MW-43-075-070	N	440	0.5 U	410000	3980		3500	75000	500 U	0.5 U		26200	3100000		1580	
MW-43-75	03/10/2006	MW-43-075-093	N	455	0.5 U	378000	3710		3010	66700	500 U	0.5 U		28800	2910000		1630	
MW-43-75	10/02/2007	MW-43-075-136	N			299000			1570	42800	298				2570000			
MW-43-90	03/07/2005	MW-43-090-055	N	527			7080	1.37	13600	381000	1470	1 U					1870	
MW-43-90	03/15/2005	MW-43-090-057	N	412		781000	6470	1 U	14300	356000	1380	1 U		45500	3640000		1670	
MW-43-90	03/15/2005	MW-90-057	FD	412		790000	6470	1 U	14500	359000	1400	1 U		46100	3730000		1550	
MW-43-90	06/20/2005	MW-43-090-070	N	412	0.5 U	846000	6920		15600	371000	1320	0.5 U		45900	4210000		1900	
MW-43-90	06/20/2005	MW-99-070	FD	409	0.5 U	830000	6430		15500	363000	1300	0.5 U		44400	4120000		1750	
MW-43-90	03/10/2006	MW-43-090-093	N	468	0.5 U	907000	6700		11900	347000	1230	0.5 U		46200	3780000		1950	
MW-43-90	10/02/2007	MW-43-090-136	N			803000			9260	454000	1260				3680000			
MW-44-70	03/23/2006	MW-44-070-002A	N	190	0.5 U	188000	1920		600	27300	1370	0.5 U		15900	1340000		589	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-44-70	10/04/2007	MW-44-070-136	N			53500			656	15600	316				692000			
MW-44-115	03/14/2006	MW-44-115-001	N	89.3	0.5 U	198000	3680		500 U	15600	500 U	0.787		28100	2890000		798	
MW-44-115	10/04/2007	MW-44-115-136	N			213000			20 U	14900	20 U				2230000			
MW-44-125	03/22/2006	MW-44-125-002A	N	62.3	0.5 U	126000	3760		500 U	7890	729	1.72		27100	2590000		766	
MW-44-125	05/03/2007	CIS-013	N	82.5	0.5 U	142000	3690	2.87	100 U	16600	777	6.43		19700	2650000		678	2 U
MW-44-125	10/04/2007	MW-44-125-136	N			138000			78.10001	11700	574				3000000			
MW-45-095a	03/24/2006	MW-45-095A-001B	N	192	0.5 U	279000	3670		500 U	25500	500 U	0.508		21400	2540000		949	
MW-45-095a	05/04/2007	CIS-009	N	198	0.5 U	164000	3100	2.24	129	16900	2.35	1 U		18000	2240000		739	2 U
MW-46-175	03/14/2006	MW-46-175-001	N	47.2	0.5 U	73600	5140		500 U	2580	500 U	1.57		35200	3940000		741	
MW-46-175	05/04/2007	CIS-022	N	43	0.5 U	73800	5650	3.99	100 U	2200	17.6	1 U		29900	3970000		680	2 U
MW-46-175	10/05/2007	MW-46-175-136	N			77700			20 U	2460	20 U				3610000			
MW-46-205	03/14/2006	MW-46-205-001	N	49.6	0.5 U	88700	6540		500 U	3190	500 U	0.573		44500	5030000		868	
MW-46-205	10/05/2007	MW-46-205-136	N			96800			20 U	3220	50.6				4630000			
MW-47-55	03/23/2006	MW-47-055-001B	N	79.8	0.5 U	150000	986		500 U	24300	500 U	1.31		11000	578000		231	
MW-47-55	05/04/2007	CIS-006	N	72.5	0.5 U	166000	1170	2.32	100 U	24500	1 U	2		10200	654000		248	2 U
MW-47-55	10/04/2007	MW-47-055-136	N			145000			20 U	30500	20 U				655000			
MW-47-115	03/23/2006	MW-47-115-001B	N	57.4	0.5 U	334000	4130		500 U	30900	500 U	1.23		24100	2850000		710	
MW-47-115	10/04/2007	MW-47-115-136	N			303000			20 U	38500	20 U				2820000			
MW-48	05/18/2006	MW-48-001D	N	53.2	0.5 U	307000	5220		500 U	49000	500 U	0.5 U		55000	3090000		475	
MW-48	10/04/2007	MW-48-136	N			344000			20 U	48300	95.4				4200000			
MW-49-135	04/25/2006	MW-49-135-001C	N	63.2	0.5 U	312000	4250		655	40600	2160	1.31		18600	2910000		643	
MW-49-135	10/10/2007	MW-49-135-136	N			263000	4420		278	34600	885	1 U			2520000		688	
MW-49-275	04/25/2006	MW-49-275-001C	N	38.4	0.5 U	191000	7720		973	8760	1000	0.745		56600	5860000		1260	
MW-49-275	10/09/2007	MW-49-275-136	N			190000	8020		41	6150	539	1 U			5030000		1320	
MW-49-365	04/26/2006	MW-49-365-001C	N	33	0.5 U	374000	13900		500 U	11700	500 U	0.5 U		98900	9530000		1280	
MW-49-365	10/09/2007	MW-49-365-136	N			363000	13900		36.9	6870	165	1 U			7860000		1080	
MW-50-095	05/09/2006	MW-50-095-001C	N	61.2	0.5 U	133000	1430		500 U	16700	500 U	2.2		10100	1030000		326	
MW-50-095	10/04/2007	MW-50-095-136	N			113000			20 U	17200	20 U				980000			
MW-50-200	05/09/2006	MW-50-200-001C	N	39.9	0.5 U	530000	6670		500 U	33100	500 U	6.06		45400	4700000		1390	
MW-50-200	10/04/2007	MW-50-200-136	N			580000			20 U	41600	20 U				4630000			
MW-51	05/12/2006	MW-51-110-001C	N	106	0.5 U	265000	3020		500 U	19000	500 U	14.1		28000	2090000		934	
MW-51	10/05/2007	MW-51-136	N			279000			20 U	22100	20 U				2190000			
MW-52D	05/01/2007	MW-52D-050107	N	52.5	0.5 U	303000	6950		500 U	21600	500 U	0.153		59900	4570000		1000	
MW-52D	08/08/2007	MW-52D-080707	N		0.5 U				784		319	1 U						

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
MW-52D	09/05/2007	MW-52D_090407	N		0.5 U				577		263	1 U						
MW-52D	10/11/2007	MW-52D-101107	N		0.5 U	276000	7580		477	21100	229	1 U			5420000		811	
MW-52M	05/01/2007	MW-52M-050107	N	95	0.5 U	305000	4600		500 U	42100	500 U	0.159		37300	2940000		678	
MW-52M	08/08/2007	MW-52M-080707	N		0.5 U				1140 J		290	1 U						
MW-52M	08/08/2007	MW-90-080707	FD		0.5 U				744 J		316	1 U						
MW-52M	09/05/2007	MW-52M_090407	N		0.5 U				534		191	1 U						
MW-52M	10/11/2007	MW-52M-101107	N		0.5 U	328000	5620		511	52500	168	1 U			4160000		848	
MW-52S	05/01/2007	MW-52S-050107	N	248	0.5 U	332000	3720		5240	66900	890	0.128		42200	2300000		418	
MW-52S	08/08/2007	MW-52S-080707	N		0.5 U				7220		1440	1.42						
MW-52S	09/05/2007	MW-52S_090407	N		0.5 U				6000		1020	1 U						
MW-52S	10/11/2007	MW-52S-101107	N		0.661	309000	3780		5110	64400	927	1 U			2970000		471	
MW-53D	05/02/2007	MW-53D-050107	N	33	0.5 U	298000	8490		500 U	18900	2490	0.1 U		51800	6150000		1070	
MW-53D	08/08/2007	MW-53D-080707	N		0.5 U				248		1690	1 U						
MW-53D	09/05/2007	MW-53D_090407	N		0.5 U				98.2		1770	1 U						
MW-53D	09/05/2007	MW-90_090407	FD		0.5 U				98.9		1760	1 U						
MW-53D	10/11/2007	MW-53D-101107	N		0.5 U	289000	9470		160 J	14600	1570	1 U			5910000		1100	
MW-53D	10/11/2007	MW-90-101107	FD		0.5 U	287000	9560		128 J	14000	1560	1 U			5230000		1100	
MW-53M	05/01/2007	MW-53M-050107	N	62.5	0.5 U	161000	4030		500 U	12900	500 U	0.112		43400	2630000		630	
MW-53M	08/08/2007	MW-53M-080707	N		0.5 U				154		306	1 U						
MW-53M	09/05/2007	MW-53M_090407	N		0.5 U				52.6		235	1 U						
MW-53M	10/11/2007	MW-53M-101107	N		0.5 U	266000	6200		63.5	28600	257	1 U			4310000		720	
MW-54-85	04/15/2008	MW-54-085-01	N	145	0.5 U	225000	3140		892	91600	771	0.5 U		17800	1790000		351	
MW-54-140	04/14/2008	MW-54-140-01	N	110	0.5 U	135000	3920		500 U	14800	1410	0.5 U		19300	2550000		498	
MW-54-195	04/14/2008	MW-54-195-01	N	55	0.5 U	131000	7150		500 U	5900	837	0.5 U		39200	5020000		1100	
MW-55-45	04/15/2008	MW-55-045-01	N	195	0.5 U	32700	315		500 U	9480	547	0.5 U		8630	267000		74.9	
MW-55-120	04/15/2008	MW-55-120-01	N	70	0.5 U	136000	2750		500 U	8210	935	0.5 U		27600	1780000		290	
MW-56D	04/29/2008	MW-56D-01b	N	105	0.5 U	343000	6640		2500 U	65500	2500 U	0.5 U		35500	4360000		946	
MW-56M	04/29/2008	MW-56M-01b	N	423	0.5 U	285000	3690		3980	73600	754	0.5 U		19000	2530000		931	
MW-56S	04/29/2008	MW-56S-01b	N	520	0.5 U	88900	1550		2590	34500	787	0.5 U		13600	1240000		396	
OW-1D	09/30/2004	OW-1D	N	39	0.5 U	340000	3040	1.34 J	300 U	17500	378	0.35	20 U	35400	2580000		440	0.4 U
OW-1D	11/18/2004	OW-1D-WQ3	N						20.8 U		301							
OW-1D	12/21/2004	OW-01D-049	N			234000			300 U	18800	332			33400	1250000			
OW-1D	05/10/2005	OW-1D-WQ6	N			230000	3170	0.5 U	104	19000	299	0.252		15500	2140000		369	
OW-1D	07/27/2005	OW-01D-075	N	39	0.5 U	223000	3200	1.14	300 U	19000	292	0.321		35600	2080000		441	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
OW-1D	08/25/2005	OW-01D-077	N	40.6	0.5 U	246000	2980	1.32	300 U	16900	194	0.486		24600	1870000		430	
OW-1D	09/14/2005	OW-01D-003	N	36.2	0.5 U	247000	2910	1.16	300 U	17000	170	0.601		29700	1990000		439	
OW-1D	10/19/2005	OW-01D-004	N	42.5	0.5 U	159000	3090	3.74	300 U	10500	500 U	2.07		22000	1130000		571	
OW-1D	11/14/2005	OW-01D-005	N	48.9	0.5 U	124000	2160	3.91	300 U	7950	500 U	3.06		17000	1120000		467	
OW-1D	12/05/2005	OW-01D-006	N	51.6	0.5 U	166000	1910	3.8	300 U	6810	500 U	2.12		16300	1380000		450	
OW-1D	03/14/2006	OW-01D-007	N	57.1	0.5 U	108000	1890	3.79	300 U	7570	500 U	3.44		18400	796000		491	
OW-1D	06/06/2006	OW-01D-008	N	58.8	0.5 U	114000	2030	2.31	300 U	7820	500 U	3.32		17600	1260000		545	
OW-1D	08/31/2006	OW-01D-009	N	54.1	0.5 U	120000	1910	2.35	300 U	8390	500 U	3.03		17400	980000		497	
OW-1D	10/12/2006	OW-01D-010	N	57.5	0.5 U	120000	2010	2.62	300 U	9610	500 U	2.79		10300	1460000		445	
OW-1D	01/25/2007	OW-01D-011	N				1980	2.65				2.23					465	
OW-1D	05/02/2007	OW-01D-012	N	62.5	0.5 U	120000	1990	3.06	100 U	10100	1 U	2.7		10400	1380000		454	
OW-1D	08/09/2007	OW-01D-013	N				2020	1.86				2.855					428	
OW-1D	10/16/2007	OW-01D-014	N	70	0.5 U	126000	1980	2.12	100 U	9840	1 U	2.47		10400	1450000		474	
OW-1M	10/01/2004	OW-1M	N	59	0.5 U	99800	1550	2.13	300 U	7950	50 U	0.91		19900	1260000		260	0.4 U
OW-1M	11/18/2004	OW-1M-WQ3	N						20.8 U		10.4 U							
OW-1M	12/21/2004	OW-01M-049	N			96800			300 U	8050	50 U			15800	863000			
OW-1M	05/10/2005	OW-1M-WQ6	N			94800	1650	0.693	100 U	7930	1.07	0.892		9300	1130000		291	
OW-1M	07/27/2005	OW-01M-075	N	51.1	0.5 U	98600	1490	2.31	300 U	8990	50 U	1.01		24300	1090000		311	
OW-1M	08/25/2005	OW-01M-077	N	53.3	0.5 U	102000	1700	0.934	300 U	7820	50 U	1.38		17800	1020000		321	
OW-1M	09/14/2005	MW-90-003	FD	46.5 J	0.5 U	137000	1690	2.08	300 U	8390	50 U	1.35		18800	1250000		328	
OW-1M	09/14/2005	OW-01M-003	N	36.2 J	0.5 U	124000	1680	1.99	300 U	8900	50 U	1.35		20200	1290000		325	
OW-1M	10/19/2005	OW-01M-004	N	40.5	0.5 U	128000	1950	2.41	300 U	9280	500 U	4.64		18900	868000		455	
OW-1M	11/14/2005	OW-01M-005	N	51.4	0.5 U	113000	1930	2.05	300 U	9420	500 U	6.49		17300	832000		471	
OW-1M	12/05/2005	OW-01M-006	N	48.8	0.5 U	159000	1890	2.08	300 U	9320	500 U	2.65		17700	1040000		475	
OW-1M	03/14/2006	OW-01M-007	N	69.5	0.5 U	156000	1910	1.73	300 U	10900	500 U	3.18		18200	765000		498	
OW-1M	06/06/2006	OW-01M-008	N	56.4	0.5 U	163000	2160	1.49	300 U	13900	500 U	2.73		22100	1310000		538	
OW-1M	08/31/2006	OW-01M-009	N	65.6	0.5 U	169000	1870	1.83	300 U	13900	500 U	2.45		21800	920000		489	
OW-1M	10/10/2006	OW-01M-010	N	65	0.5 U	181000	1980	1.98	300 U	12200	500 U	2.98		17800	1030000		440	
OW-1M	01/25/2007	OW-01M-011	N				1970	1.96				2.43					464	
OW-1M	05/01/2007	OW-01M-012	N	70	0.5 U	133000	2120	1.87	100 U	12000	1 U	1.41		9810	1090000		471	
OW-1M	08/09/2007	OW-01M-013	N				2000	2.4				2.775					408	
OW-1M	10/16/2007	OW-01M-014	N	85	0.5 U	194000	2100	2.05	100 U	17200	1 U	2.56		12900	1440000		497	
OW-1S	12/21/2004	OW-01S-049	N			78800			407	14100	50 U			12600	291000			
OW-1S	07/28/2005	MW-90-075	FD	75.4	0.5 U	61900	491	2.44	300 U	11000	50 U	3.15		11300	279000		114	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
OW-1S	07/28/2005	OW-01S-075	N	80.3	0.5 U	66400	494	2.45	300 U	11600	50 U	3.2		12000	277000		114	
OW-1S	08/26/2005	OW-01S-077	N	73.4	0.5 U	82700	599	2.1	300 U	13500	50 U	2.67		11500	293000		136	
OW-1S	09/15/2005	OW-01S-003	N	68.8	0.5 U	97000	589	2.04	300 U	14600	50 U	2.42		13000	361000		126	
OW-1S	10/20/2005	OW-01S-004	N	67.5	0.5 U	107000	641	2.26	300 U	13100	500 U	3.19		15600	491000		150	
OW-1S	11/16/2005	OW-01S-005	N	81.8	0.5 U	50300	580	2.36	300 U	15700	500 U	3.19		10200	133000		134	
OW-1S	12/05/2005	MW-90-006	FD	84.1	0.5 U	80600	533	2.51	300 U	11200	500 U	2.7		8270	228000		127	
OW-1S	12/05/2005	OW-01S-006	N	73.3	0.5 U	90400	543	2.5	300 U	12400	500 U	2.57		9250	239000		129	
OW-1S	03/15/2006	OW-01S-007	N	74.5	0.5 U	79500	571	2.17	300 U	15300	500 U	3.28		10700	181000		130	
OW-1S	06/06/2006	OW-01S-008	N	66.2	0.5 U	123000	644	2.2	300 U	16600	500 U	3.45		11800	389000		143	
OW-1S	08/31/2006	OW-01S-009	N	65.6	0.5 U	115000	606	2.41	300 U	19300	500 U	3.58		13200	287000		124	
OW-1S	10/10/2006	OW-01S-010	N	67.5	0.5 U	103000	584	2.57	300 U	14800	500 U	4.02		9700	269000		137	
OW-1S	01/24/2007	OW-01S-011	N				590	2.54				3.15					128	
OW-1S	05/01/2007	OW-01S-012	N	70	0.5 U	102000	733	2.35	100 U	17600	1.66	1.68		8240	397000		141	
OW-1S	08/09/2007	OW-01S-013	N				686	2.5				3.065					127	
OW-1S	10/16/2007	OW-01S-014	N	80	0.5 U	95100	635	2.74	100 U	16700	1.21	3.09		7590	353000		142	
OW-2D	01/13/2005	OW-2D-WQ5	N			303000			164	15200	390			46600	2000000			
OW-2D	05/10/2005	OW-2D-WQ6	N			319000	4460	0.5 U	161	19300	286	0.107		18600	3000000		535	
OW-2D	07/28/2005	OW-02D-075	N	34.1	0.5 U	296000	4100	0.966	300 U	16200	175	0.1 U		38300	2590000		616	
OW-2D	08/25/2005	OW-02D-077	N	43.1	0.5 U	58800	1640	1.19	300 U	3330	50 U	2.61		16100	1100000		376	
OW-2D	09/14/2005	OW-02D-003	N	38.7	0.5 U	90300	1770	1.78	300 U	4650	50 U	2.99		21500	1570000		381	
OW-2D	10/20/2005	OW-02D-004	N	30	0.5 U	142000	1730	1.57	300 U	8220	500 U	3.52		21000	805000		381	
OW-2D	11/14/2005	OW-02D-005	N	33.4	0.5 U	199000	2230	2.38	300 U	12000	500 U	7.57		20900	1110000		541	
OW-2D	12/05/2005	OW-02D-006	N	46.1	0.5 U	231000	2140	1.69	300 U	11300	500 U	3.67		20000	1170000		531	
OW-2D	03/14/2006	OW-02D-007	N	76.9	0.5 U	194000	1930	1.71	300 U	16800	500 U	3.28		23700	863000		506	
OW-2D	06/07/2006	OW-02D-008	N	74.8	0.5 U	230000	2050	1.62	300 U	20200	500 U	3.44		26400	1310000		516	
OW-2D	08/31/2006	OW-02D-009	N	64.7	0.5 U	196000	1890	1.71	300 U	18000	500 U	2.83		22100	904000		492	
OW-2D	10/10/2006	OW-02D-010	N	67.5	0.5 U	191000	2040	1.78	300 U	18200	500 U	3.28		20300	967000		450	
OW-2D	01/24/2007	OW-02D-011	N				2060	1.72				2.89					475	
OW-2D	04/30/2007	OW-02D-012	N	80	0.5 U	164000	2120 J	1.88	100 U	17500	1 U	2.55		11300	1320000		490 J	
OW-2D	08/09/2007	OW-02D-013	N				2040	2.12				2.585					432	
OW-2D	10/17/2007	OW-02D-014	N	92.5	0.5 U	209000	2280	2.12	100 U	23600	1 U	2.81		13600	1360000		465	
OW-2M	05/11/2005	OW-2M-WQ6	N			142000	2080	0.5 U	100 U	11800	44.2	0.574		10800	1310000		316	
OW-2M	07/28/2005	OW-02M-075	N	51.1	0.5 U	132000	1900	2.19	300 U	10800	50 U	0.735		23600	1050000		342	
OW-2M	08/25/2005	OW-02M-077	N	50.8	0.5 U	124000	1770	0.991	300 U	9130	50 U	1.73		18600	1100000		350	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
OW-2M	09/14/2005	OW-02M-003	N	41.3	0.5 U	144000	1730	2.22	300 U	9840	50 U	2.33		19300	1290000		368	
OW-2M	10/20/2005	OW-02M-004	N	37.5	0.5 U	151000	1820	2.29	300 U	9970	500 U	4.33		18700	980000		389	
OW-2M	11/15/2005	MW-90-005	FD	46	0.5 U	150000	1920	2.15	300 U	11000	500 U	7		19100	932000		435	
OW-2M	11/15/2005	OW-02M-005	N	38.3	0.5 U	140000	2070	1.96	300 U	11300	500 U	7.16		20000	865000		461	
OW-2M	12/06/2005	OW-02M-006	N	46.1	0.5 U	214000	2000	1.87	300 U	15300	500 U	3.91		22400	1110000		497	
OW-2M	03/14/2006	OW-02M-007	N	67	0.5 U	181000	1990	1.83	300 U	14600	500 U	3.24		23300	818000		519	
OW-2M	06/07/2006	OW-02M-008	N	59.8	0.5 U	190000	2060	1.62	300 U	15200	500 U	2.37		22600	1180000		532	
OW-2M	08/30/2006	OW-02M-009	N	65.1	0.5 U	187000	2220	1.83	300 U	16800	500 U	2.68		23400	922000		555	
OW-2M	10/10/2006	MW-91-010	FD	65	0.5 U	195000	1980	2.01	300 U	15300	500 U	3.25		19500	1030000		443	
OW-2M	10/10/2006	OW-02M-010	N	60	0.5 U	192000	1920	2.02	300 U	15100	500 U	3.27		19600	1040000		456	
OW-2M	01/24/2007	OW-02M-011	N				1980	1.99				2.62					466	
OW-2M	04/30/2007	OW-02M-012	N	55	0.5 U	173000	2160 J	1.82	100 U	16200	1 U	1.94		12300	1340000		501 J	
OW-2M	08/09/2007	OW-02M-013	N				1990	1.88				2.545					408	
OW-2M	10/16/2007	OW-02M-014	N	85	0.5 U	191000	2090	1.95	100 U	19000	1 U	2.62		13100	1430000		496	
OW-2S	12/29/2004	OW-2S-WQ5	N			33700			300 U	5560	131			11300	218000			
OW-2S	07/28/2005	OW-02S-075	N	107	0.5 U	37500	381	3.79	300 U	5180	50 U	3.81		9440	274000		126	
OW-2S	08/26/2005	OW-02S-077	N	114	0.5 U	36700	397	3.64	300 U	5180	50 U	3.08		9290	280000		129	
OW-2S	08/26/2005	OW-90-077	FD	114	0.5 U	36500	399	3.68	300 U	5200	50 U	3.24		9330	261000		130	
OW-2S	09/14/2005	OW-02S-003	N	103	0.5 U	43100	418	3.59	300 U	5330	50 U	3.4		9130	452000		128	
OW-2S	10/20/2005	OW-02S-004	N	100	0.5 U	45300	383	3.85	300 U	5030	500 U	4.98		7790	234000		135	
OW-2S	11/15/2005	OW-02S-005	N	120	0.5 U	38100	406	3.5	300 U	5020	500 U	7.75		7900	240000		131	
OW-2S	12/06/2005	OW-02S-006	N	111	0.5 U	40100	370	3.96	300 U	5490	500 U	3.75		8020	239000		127	
OW-2S	03/15/2006	MW-90-CMP-007	FD	102	0.5 U	37000	403	4.17	300 U	5060	500 U	3.48		8730	194000		134	
OW-2S	03/15/2006	OW-02S-007	N	107	0.5 U	43200	385	4.38	300 U	5540	500 U	3.31		9320	226000		131	
OW-2S	06/06/2006	MW-90-008a	FD	103	0.5 U	56600	421	4.01	300 U	5210	500 U	4.57		8720	416000		135	
OW-2S	06/06/2006	OW-02S-008	N	101	0.5 U	57700	429	4.16	300 U	5160	500 U	4.41		8770	422000		137	
OW-2S	09/08/2006	MW-90-009	FD	113	0.5 U	35900	414	4.36	300 U	4860	500 U	4.71		7820	245000		122	
OW-2S	09/08/2006	OW-02S-009	N	103	0.5 U	37600	409	4.42	300 U	4980	500 U	4.96		7930	227000		120	
OW-2S	10/10/2006	MW-90-010a	FD	95.5	0.5 U	36500	394	4.92	300 U	4580	500 U	5.37		7080	232000		130	
OW-2S	10/10/2006	OW-02S-010	N	97.5	0.5 U	38200	397	4.93	300 U	4840	500 U	4.99		7510	269000		132	
OW-2S	01/24/2007	MW-90-CMP-011	FD				411	4.66				3.8					121	
OW-2S	01/24/2007	OW-02S-011	N				416	4.6				3.93					122	
OW-2S	04/30/2007	CIS-011	N	103	0.5 U	36900	474 J	5.23	100 U	4970	1.1	4.25 J		5840	331000		131 J	2 U
OW-2S	08/09/2007	MW-90-CMP-013	FD				437	4.82				4.035					107	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
OW-2S	08/09/2007	OW-02S-013	N				435	4.92				4.145					108	
OW-2S	10/17/2007	OW-02S-014	N	100	0.5 U	34500	423	4.86	100 U	4620	1 U	3.74		5630	321000		127	
OW-3D	10/28/2004	OW-3D-WQ2	N	70	0.5 U	54500	1240	3.89	300 U	7370	125	0.36		15800	743000		218	
OW-3D	11/16/2004	OW-3D-WQ3	N						132		130							
OW-3D	12/14/2004	OW-3D-WQ4	N			96000			300 U	8680	136			17200	956000			
OW-3D	03/09/2006	OW-03D-093	N	38.5	0.5 U	126000	2200		500 U	11000	500 U	0.5 U		11000	1470000		359	
OW-3D	10/03/2007	OW-03D-136	N			156000			20 U	15400	20 U				1700000			
OW-3M	10/28/2004	MW-90-WQ2	FD	61	0.5 U	44800	1080	2.19	300 U	6100	50 U	1.53		13200	676000		197	
OW-3M	10/28/2004	OW-3M-WQ2	N	62	0.5 U	47400	1060	2.18	300 U	5910	50 U	1.53		13100	596000		219	
OW-3M	11/16/2004	OW-3M-WQ3	N						20.8 U		10.4 U							
OW-3M	12/15/2004	OW-3M-WQ4	N			67300				6470				12400	723000			
OW-3M	03/09/2006	OW-03M-093	N	56.5	0.5 U	74200	1390		500 U	6710	500 U	1.07		6290	882000		266	
OW-3M	05/04/2006	OW-03M-CIS	N	58.6	0.5 U	75600	1510	1.56	100 U	7670	1 U	0.886		7800	1120000		329	
OW-3M	05/01/2007	CIS-023	N	57	0.5 U	75200	1510	2.58	100 U	6860	1 U	1.31		7810	1080000		266	2 U
OW-3M	10/03/2007	OW-03M-136	N			64700			20 U	7350	20 U				1120000			
OW-3S	10/28/2004	OW-3S-WQ2	N	99	0.5 U	27200	280	4.59	300 U	4530	50 U	2.53 J		10300	183000		64.8	
OW-3S	11/16/2004	OW-3S-WQ3	N						20.8 U		10.4 U							
OW-3S	12/15/2004	OW-3S-WQ4	N			21100				4010				5350	174000			
OW-3S	03/09/2006	OW-03S-093	N	61.7	0.5 U	97800	445		500 U	14700	500 U	2.74		7680	187000		78.8	
OW-3S	04/30/2007	CIS-014	N	62.5	0.5 U	112000	564	3.25	100 U	16200	9.43	3.25		9190	203000		90.9 J	2 U
OW-3S	10/03/2007	OW-03S-136	N			439000			32.9	40300	88.5				4790000			
OW-5D	12/22/2004	MW-96-049	FD			222000			300 U	15200	363			32300	1480000			
OW-5D	12/22/2004	OW-5D-049	N			212000			300 U	14600	371			30200	1370000			
OW-5D	05/11/2005	OW-5D-WQ6	N			254000	3610	0.5 U	237	16800	269	0.159		17000	2460000		461	
OW-5D	07/28/2005	OW-05D-075	N	36.5	0.5 U	248000	3350	1.11	300 U	15700	226	0.151		30700	2040000		480	
OW-5D	08/26/2005	OW-05D-077	N	35.4	0.5 U	223000	3750	1.42	300 U	12400	103	0.241		29200	1960000		516	
OW-5D	09/13/2005	OW-05D-003	N	31	0.5 U	314000	3370	1.26	300 U	16600	113	0.334		32800	2450000		501	
OW-5D	10/19/2005	OW-05D-004	N	37.5	0.5 U	178000	2850	2.11	300 U	8900	500 U	1.54		23100	1260000		496	
OW-5D	11/15/2005	OW-05D-005	N	43.5	0.5 U	139000	2500	3.42	300 U	6880	500 U	5.99		19000	1300000		506	
OW-5D	12/06/2005	OW-05D-006	N	46.1	0.5 U	124000	2150	4.56	300 U	6530	500 U	2.24		17900	1220000		444	
OW-5D	03/15/2006	OW-05D-007	N	49.6	0.5 U	93900	1970	1.49	300 U	4800	500 U	3.23		18100	861000		510	
OW-5D	06/07/2006	OW-05D-008	N	59.3	0.5 U	124000	2120	3.03	300 U	5090	500 U	2.72		18400	1100000		539	
OW-5D	08/30/2006	OW-05D-009	N	72	0.5 U	102000	2280	1.98	300 U	5420	500 U	2.68		17800	1020000		534	
OW-5D	10/11/2006	OW-05D-010	N	75	0.5 U	174000	1990	1.8	300 U	8890	500 U	3.3		20900	1320000		456	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
OW-5D	01/25/2007	OW-05D-011	N				2060	1.86				2.7					477	
OW-5D	05/01/2007	OW-05D-012	N	80	0.5 U	156000 J	1840	1.73	100 U	15800	1 U	1.46		12000	1370000 J		424	
OW-5D	08/09/2007	OW-05D-013	N				2070	2.13				2.615					458	
OW-5D	10/17/2007	OW-05D-014	N	87.5	0.5 U	197000	2210	2.1	100 U	22200	1 U	2.83		14200	1440000		466	
OW-5M	01/13/2005	OW-5M-WQ5	N			290000			50 U	10400	50 U			26000	1220000			
OW-5M	05/11/2005	OW-5M-WQ6	N			182000	2590	0.5 U	100 U	13200	2.83	0.51		12900	1820000		386	
OW-5M	07/28/2005	OW-05M-075	N	38.9	0.5 U	161000	2470	2.74	300 U	12000	50 U	0.621		25800	1520000		417	
OW-5M	08/26/2005	OW-05M-077	N	43	0.5 U	168000	2630	1.17	300 U	10300	50 U	0.619		21100	1440000		414	
OW-5M	09/13/2005	OW-05M-003	N	41.3	0.5 U	225000	2580	1.07	300 U	13200	50 U	0.69		27700	2050000		401	
OW-5M	10/20/2005	MW-90-004	FD	40	0.5 U	180000 J	2550	2.96	300 U	11200	500 U	0.655		22400	1130000 J		386	
OW-5M	10/20/2005	OW-05M-004	N	40	0.5 U	227000 J	2560	2.9	300 U	12100	500 U	0.646		25000	1440000 J		391	
OW-5M	11/15/2005	OW-05M-005	N	43.5	0.5 U	176000	2770	2.94	300 U	11800	500 U	2.05		22100	1180000		468	
OW-5M	12/06/2005	OW-05M-006	N	43.4	0.5 U	211000	2680	1.96	300 U	11600	500 U	0.66		21000	1330000		435	
OW-5M	03/15/2006	OW-05M-007	N	39.7	0.5 U	200000	2600	1.35	300 U	11500	500 U	1.15		24300	1170000		455	
OW-5M	06/07/2006	OW-05M-008	N	41.8	0.5 U	203000	2770	2.97	300 U	11400	500 U	1.4		23100	2210000		497	
OW-5M	08/30/2006	OW-05M-009	N	52.3	0.5 U	186000	2680	3.6	300 U	11600	500 U	2.48		26100	1300000		531	
OW-5M	10/11/2006	OW-05M-010	N	56.5	0.5 U	140000	2120	3.97	300 U	8060	500 U	3.15		16600	1170000		466	
OW-5M	01/25/2007	OW-05M-011	N				2010	3.15				2.5					467	
OW-5M	04/30/2007	CW-90-012	FD	75	0.5 U	131000	2260 J	2.72	100 U	8890	1 U	1.28 J		10300	1490000		526 J	
OW-5M	04/30/2007	OW-05M-012	N	70	0.5 U	131000	2250 J	2.56	100 U	8920	1 U	2.1 J		10500	1510000		526 J	
OW-5M	08/08/2007	OW-05M-013	N				2020	2.71				8.155					473	
OW-5M	10/17/2007	MW-90-014	FD	77.5	0.5 U	149000	2160	2.19	100 U	10800 J	1 UJ	2.64		11200	1420000		472	
OW-5M	10/17/2007	OW-05M-014	N	75	0.5 U	149000	2140	2.12	100 U	16600 J	19 J	2.72		12500	1460000		457	
OW-5S	12/21/2004	OW-05S-049	N			52500			300 U	8060	50 U			11800	194000			
OW-5S	05/11/2005	OW-5S-WQ6	N			54200	401	2.16	100 U	9120	5.35	3.18		6640	274000		108	
OW-5S	05/11/2005	OW-91-WQ6	FD			55200	400	2.12	100 U	9300	6.47	3.13		6710	280000		107	
OW-5S	07/28/2005	OW-05S-075	N	85.1	0.5 U	49400	371	2.3	300 U	8770	50 U	3.55		10200	235000		105	
OW-5S	08/26/2005	OW-05S-077	N	88.6	0.5 U	56900	401	2.07	300 U	9330	50 U	2.96		9670	240000		104	
OW-5S	09/13/2005	OW-05S-003	N	80.1	0.5 U	73700	392	1.98 J	300 U	10100	50 U	2.68		11300	304000		98.5	
OW-5S	10/20/2005	OW-05S-004	N	80	0.5 U	73900	375	2.2	300 U	10600	500 U	1.74		9980	221000		113	
OW-5S	11/15/2005	OW-05S-005	N	94.6	0.5 U	66000	409	1.69	300 U	9830	500 U	7.67		8570	212000		104	
OW-5S	12/06/2005	OW-05S-006	N	92.3	0.5 U	59200	365	2.22	300 U	9320	500 U	3.18		8230	195000		106	
OW-5S	03/15/2006	OW-05S-007	N	89.3	0.5 U	52800	371	2.25	300 U	8530	500 U	3.43		8680	150000		112	
OW-5S	06/07/2006	OW-05S-008	N	85	0.5 U	63500	423	2.18	300 U	8680	500 U	3.89		9120	271000		121	

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
OW-5S	08/31/2006	OW-05S-009	N	88.8	0.5 U	56400	389	2.54	300 U	8580	500 U	4.76		8220	187000		118	
OW-5S	10/10/2006	OW-05S-010	N	87.5	0.5 U	51700	381	2.6	300 U	8380	500 U	5.01		8110	182000		144 J	
OW-5S	01/25/2007	OW-05S-011	N				375	2.57				3.8					110	
OW-5S	04/30/2007	CIS-018	N	87.5	0.5 U	59200 J	480	2.82	100 U	9120	1 U	4.25		6880	273000 J		114 J	2 U
OW-5S	08/09/2007	OW-05S-013	N				406	2.6				4.005					97.8	
OW-5S	10/17/2007	OW-05S-014	N	87.5	0.5 U	53900	422	2.5	103	8540	2.92	3.66		6710	271000		102	
Park Moabi-4	05/02/2007	PM4-125	N	67.5	0.5 U		330					25.9					73.9	2 U
Park Moabi-4	07/18/2007	PM4-125R	N									2.8						
Park Moabi-4	10/04/2007	PM-04-136	N			89300			617	22300	20 U				280000			
PE-1	03/21/2005	PE-1-058	N	193		356000	4100	2.56	500 U	34000	2280	0.623		27500	2740000		1260	
PE-1	10/03/2005	PE-01-081	N	255	0.5 U	401000	3600	0.653	3280	47200	1070	0.19		48700	2000000	13600	1090	
PE-1	03/17/2006	PE-01_031706	N	277		261000	2990		500 U	37400	12.7	0.5 U		19700	2200000		900	2 U
PE-1	04/05/2006	PE-01_040506	N	256		263000	3110		500 U	36400	12.3	0.5 U		19600	2090000		939	2 U
PGE-6	07/01/1997	PGE-6 1530_07/01/1997	FD	180	3	95000	920	5.3		21000	110	3.1612		10000	730000		460	0.02 U
PGE-6	07/01/1997	PGE-6 1530_07/01/1997	FD	181	2.4	90900	890	5.58		20200	110	3.02572		14400	631000		354	0.2 U
PGE-6	07/01/1997	PGE-6 1750_07/01/1997	N	194	1.79	95100	900	5.6		21000	110	3.90634		14500	661000		515	0.2 U
PGE-6	06/15/1998	PGE-6_06/15/1998	N	81	3.2	122000	1020			31000	140	1.39996		20200	881000		741	0.2 U
PGE-6	09/01/2000	PGE-6_09/01/2000	N	80	6.84 J	133000	1060	3.1		32100	190	1.17416		18500	930000		1020	0.2 UJ
PGE-6	11/29/2001	PGE-6_11/29/2001	N	132	1.2	104000	983	4.8		25400	110	2.19026		12600	831000		659	0.2 U
PGE-7	07/17/1998	PGE-7_07/17/1998	N	48	1	264000	4230			7500	31	5.1934		54000	3170000		1370	0.2 U
PGE-7	09/01/2000	PGE-7_09/01/2000	N	46	0.2 J	303000	4530	3.3		7900	25	10.3868		55600	3200000		1360	0.2 UJ
PGE-7	11/29/2001	PGE-7_11/29/2001	N	59.6	0.31	272000	4500	3.7		7400	23	7.76752		34300	3100000		1190	0.2 U
PGE-8	07/01/1997	PGE-8_07/01/1997	N	75	5.4	784000	4200	5.6		12400	150	1.19674		79700	3110000		3100	1.3
PGE-8	06/15/1998	PGE-8_06/15/1998	N	19	4.53	803000	4530			16300	60	1.53544		83200	3460000		3420	0.2 U
PGE-8	09/01/2000	PGE-8_09/01/2000	N	55	2.6 J	792000	4230	6.07		5500	16	3.6128		85700	3270000		3710	0.08 J
PGE-8	11/29/2001	PGE-8_11/29/2001	N	57.5	4.2	791000	4870	6.2		18600	400	3.65796		75300	3750000		3050	0.2 U
PGE-8	08/11/2007	PGE-08-8-11-07-4	N	40		327000	6610		80.2	20700	739	1 U		64700	3480000		1280	
PT-1D	03/17/2006	DUP 2_031706	FD	110		316000	3610		500 U	24900	85.7	1.84		24800	2550000		941	2 U
PT-1D	03/17/2006	PT1D_031706	N	107		321000	3650		500 U	24900	88.2	1.84		24600	2540000		943	2 U
PT-1D	04/06/2006	DUP-1_040606	FD	98.1		334000	3700		500 U	23600	54.8	2.26		25100	2700000		963	2 U
PT-1D	04/06/2006	PT1D_040606	N	101		332000 J	3780		500 U	24000	51	2.27		25300	2680000 J		978	2 U
PT-1M	03/17/2006	PT1M_031706	N	145		229000	1790		500 U	40100	1330	0.5 U		15700	1230000		411	2 U
PT-1M	04/06/2006	PT1M_040606	N	144		242000	1840		557	40600	1350	0.5 U		15000	1290000		446	2 U
PT-1S	03/17/2006	PT1S_031706	N	367		262000	1710		1930	74700	1320	0.5 U		15400	1040000		198	2 U

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
PT-1S	04/06/2006	PT1S_040606	N	368		267000	1740		1860	70500	779	0.5 U		14400	1090000		181	2 U
PT-2D	03/17/2006	Dup 1_031706	FD	112		315000	3560		500 U	26300	161	1.26		25200	2560000		924	2 U
PT-2D	03/17/2006	PT2D_031706	N	125		314000	3530		500 U	25700	154	1.23		24900	2530000		931	2 U
PT-2D	04/06/2006	DUP-2_040606	FD	109		338000	3660		500 U	25800	78.3	1.84		25300	2650000		946	2 U
PT-2D	04/06/2006	PT2D_040606	N	109		338000	3550		500 U	25600	79.7	1.68		25100	2640000		924	2 U
PT-2M	03/17/2006	PT2M_031706	N	264		227000	1880		500 U	35600	547	0.5 U		14700	1340000		474	2 U
PT-2M	04/06/2006	PT2M_040606	N	204		232000	1920		500 U	35600	380	0.5 U		13400	1400000		471	2 U
PT-2S	03/17/2006	PT2S_031706	N	613		273000 J	1630		976	92700 J	1170 J	0.5 U		12500	929000 J		11.7	2 U
PT-2S	04/06/2006	PT2S_040606	N	635		300000	1670		1850	99800	1240	0.5 U		12100	1030000		8.91	2 U
PT-3D	03/18/2006	PT3D_031806	N	104		273000	3920		500 U	19200	16.7	3.33		22900	2570000		984	2 U
PT-3D	04/05/2006	PT3D_040506	N	87.2 J		277000	3760		500 U	18200	10.2	3.28		22200	2720000		966	2 U
PT-3M	03/18/2006	PT3M_031806	N	112		162000	1830		500 U	32600	1670	0.5 U		19900	1360000		571	2 U
PT-3M	04/07/2006	PT3M_040706	N	131 J		184000	1910		500 U	30500	2020	0.5 U		18300	1510000		672	2 U
PT-3S	03/16/2006	PT3S_031606	N	334		244000	1740		4860	85600	1160	0.5 U		10000	942000		217	2 U
PT-3S	04/03/2006	PT3S_040306	N	369		236000	1800		4990	80600	988	0.5 U		10300	930000		221	2 U
PT-4D	03/15/2006	PT4D_031506	N	79.4		334000	4350		500 U	20700	8.27	4.28		24800	3150000		1080	2 U
PT-4D	04/05/2006	PT4D_040506	N	68.1		339000	4450		500 U	21100	5 U	4.7		24000	3060000		1110	2 U
PT-4M	03/15/2006	PT4M_031506	N	144		148000	1800		500 U	25700	966	0.5 U		18700	1370000		609	2 U
PT-4M	04/07/2006	PT4M_040706	N	117 J		155000	1800		500 U	28900	766	0.5 U		20400	1480000		722	2 U
PT-4S	03/15/2006	PT4S_031506	N	184		261000	1800		713	64300	919	0.5 U		14100	1180000		474	2 U
PT-4S	04/06/2006	PT4S_040606	N	188		282000	2020		1350	61800	707	0.5 U		13400	1300000		450	2 U
PT-5D	03/16/2006	PT5D_031606	N	62.3		317000	4460		500 U	21000	355	4.86		24500	3150000		1080	2 U
PT-5D	04/07/2006	PT5D_040706	N	289 J		337000	2190		2200	73200	1700	0.5 U		14500	1400000		403	2 U
PT-5M	03/16/2006	PT5M_031606	N	237		196000	1740		500 U	33000	707	0.5 U		11000	1220000		463	2 U
PT-5M	04/07/2006	PT5M_040706	N	270 J		332000	2210		1820	72200	1770	0.5 U		14500	1420000		443	2 U
PT-5S	03/16/2006	PT5S_031606	N	279		315000	2050		971	72300	2440	0.5 U		14200	1320000		401	2 U
PT-5S	04/07/2006	PT5S_040706	N	237 J		323000	2170		1030	65700	1850	0.5 U		13800	1460000		490	2 U
PT-6D	03/16/2006	PT6D_031606	N	102		245000	3630		500 U	16200	361	2.5		19900	2600000		844	2 U
PT-6D	04/04/2006	PT6D_040406	N	97.3		239000	3420		500 U	17500	258	1.73		19800	2620000		750	2 U
PT-6M	03/16/2006	PT6M_031606	N	227		230000	1840		500 U	39700	56.1	0.5 U		11800	1300000		486	2 U
PT-6M	04/04/2006	PT6M_040406	N	227		238000	1980		500 U	43400	55.2	0.5 U		12800	1392000		498	2 U
PT-6S	03/16/2006	PT6S_031606	N	501			2850					0.5 U					61.8	
PT-6S	03/18/2006	PT6S_031806	N			269000	2870		3530	157000	9260	0.5 U		21400	1490000		60	2 U
PT-6S	04/04/2006	PT6S_040406	N	451		296000	2900		6310	153000	7650	0.5 U		20300	1540000		57.8	2 U

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
PT-7D	07/18/2007	PT-7D_071807	N	52.5		321000	5490		500 U		48.3	7.41		38600	3630000		1140	2 U
PT-7M	07/19/2007	PT-7M_071907	N	97.5		419000	1920		500 U		31.6	25.2		23900	1350000		1250	2 U
PT-7S	07/18/2007	PT-7S_071807	N	125		159000	1250		500 U		55.6	22		14500	999000		674	2 U
PT-8D	07/16/2007	PT-8D_071607	N	45		281000	5360		500 U		23.5	9.72		35100	3300000		1110	2 U
PT-8M	07/18/2007	PT-8M_071807	N	103		353000	1510		500 U		15.5	31.8		22200	1130000		1330	2 U
PT-8S	07/16/2007	PT-8S_071607	N	125		132000	1190		500 U		25.1	25.1		12500	955000		869	2 U
PT-9D	07/17/2007	PT-9D_071707	N	52.5		368000	4350		500 U		29.4	9.3		34200	2840000		1260	2 U
PT-9M	07/17/2007	DUP-1_071707	FD	100		476000	1400		500 U		18.2	24.6		29800	1020000		1410	2 U
PT-9M	07/17/2007	PT-9M_071707	N	97.5		485000	1400		500 U		18.7	24.4		30200	1030000		1410	2 U
PT-9S	07/17/2007	PT-9S_071707	N	155		108000	895		500 U		29	16.4		11800	820000		689	2 U
PTI-1D	03/15/2006	PTI-1D_031506	N	134		289000	3420		500 U	21500	1070	0.5 U		23600	2470000		907	2 U
PTI-1D	04/03/2006	PTI-1D_040306	N	99.7		267000	3620		500 U	18000	140	2.53		21700	2600000		912	2 U
PTI-1M	03/15/2006	PTI-1M_031506	N	179		223000	1910		500 U	33200	141	0.5 U		12200	1360000		510	2 U
PTI-1M	04/04/2006	PTI-1M_040406	N	180		226000	2050		500 U	37700	99.5	0.5 U		12800	1480000		529	2 U
PTI-1S	03/15/2006	PTI-1S_031506	N	375		266000	1730		8350	88200	717	0.5 U		11600	980000		122	2 U
PTI-1S	04/05/2006	PTI-1S_040506	N	357		266000 J	1760		3320	88200 J	606	0.5 U		11200	996000 J		120	2 U
PTR-1	07/19/2007	PTR-1_071907	N	97.5		254000	1940		500 U		92.2	18.4		21500	1500000		983	2 U
PTR-2	07/18/2007	PTR-2_071807	N	92.5		335000	2200		500 U		68.7	25.8		23200	1610000		1200	2 U
TW-1	12/21/2004	TW-01-049	N			257000			300 U	21400	50 U			33600	905000			
TW-1	10/11/2007	TW-01-136	N			267000	1450		20 U	20700	20 U	5.42			1960000		1210	
TW-2D	07/29/2004	TW-2D-037Q	N			272000			500 U	18000	10 U		40 U					
TW-2D	12/16/2004	TW-2D-049	N			234000			300 U	16800	50 U			32100	1600000			
TW-2D	06/15/2005	TW-02D-070	N	66.2	0.5 U	272000	2950	2.8	100 U	23600	1 U	5.02		20800	2170000	6140	754	
TW-2D	03/15/2006	TW-02D-093	N	109	0.5 U	234000	2250		500 U	24300	500 U	1.42		16900	1450000		542	
TW-2D	03/17/2006	TW-02D_031706	N	110		207000	1920		500 U	23600	5 U	1.67		13200	1240000		501	2 U
TW-2D	04/05/2006	TW-02D_040506	N	112		231000	2070		500 U	25800	5 U	1.51		14700	1400000		509	2 U
TW-2D	10/04/2007	TW-02D-136	N			127000			20 U	34100	20 U				1590000			
TW-2S	07/29/2004	TW-2S-037Q	N			155000			500 U	40200	10 U		8 U					
TW-2S	12/16/2004	TW-2S-049	N			180000			300 U	39900	50 U			13700	427000			
TW-2S	06/16/2005	TW-02S-070	N	70.1	0.5 U	1000 U	778	2.05	100 U	1000 U	1 U	6.71		1000 U	1000 U	1U	261	
TW-2S	03/15/2006	TW-02S-093	N	79.4	0.5 U	135000	731		500 U	30700	500 U	5.3		10100	411000		240	
TW-2S	10/04/2007	TW-02S-136	N			103000			20 U	29200	20 U				404000			
TW-3D	03/17/2006	TW-03D_031706	N	97.3		254000	2190		500 U	27700	5 U	4.87		15900	1540000		613	2 U
TW-3D	04/05/2006	TW-03D_040506	N	89.9		283000	2580		500 U	28800	5 U	4.61		17900	1740000		645	2 U

Table A-1b. Groundwater Data Summary – Site – Essential Nutrients, Perchlorate and Strontium

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
TW-4	05/18/2006	TW-04-001D	N	55.9	0.5 U	464000	6760		500 U	56700	703	1.43		40700	4310000		1140	
TW-4	10/03/2007	TW-04-136	N			315000			20 U	64600	226				4540000			
TW-5	05/10/2006	TW-05-001C	N	34.6	0.5 U	319000	3190		500 U	21200	500 U	0.542		22100	2690000		420	
TW-5	10/04/2007	TW-05-136	N			338000			20 U	32500	20 U				2920000			

Notes:

(1) Concentrations are reported in milligrams per liter (mg/L) and micrograms per liter (µg/L).

(2) Sample types are as follows:

N = Primary sample; and

FD = Field duplicate sample.

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

(5) Sample results for ammonia and ammonia as nitrogen are combined.

(6) Sample results for nitrate as NO3-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined.

Table A-1c. Groundwater Data Summary – Site – Radiological Compounds

Well	Date	Sample ID	Sample Type	Gross Alpha	Gross Beta	Radium 226	Radium 228	Tritium	Uranium, dissolved
MW-1	05/09/2005	MW-01-BKG-001	N					350 U	
MW-1	07/18/2005	MW-01-BKG-002	N					16.5 U	
MW-3	05/09/2005	MW-03-BKG-001	N					350 U	
MW-3	07/18/2005	MW-03-BKG-002	N					53.6 U	
MW-4	05/09/2005	MW-04-BKG-001	N					350 U	
MW-4	07/18/2005	MW-04-BKG-002	N					120 U	
MW-5	05/13/2005	MW-05-BKG-001	N					350 U	
MW-5	07/18/2005	MW-05-BKG-002	N					57.7 U	
MW-6	05/13/2005	MW-06-BKG-001	N					350 U	
MW-6	07/18/2005	MW-06-BKG-002	N					96.9 U	
MW-7	05/13/2005	MW-07-BKG-001	N					350 U	
MW-7	07/18/2005	MW-07-BKG-002	N					196 U	
MW-8	05/13/2005	MW-08-BKG-001	N					350 U	
MW-8	07/18/2005	MW-08-BKG-002	N					140 U	
MW-13	07/29/2004	MW-13-037	N	0.24 U	1.59 J	0.101 UJ	0.716 U		0.8
MW-13	07/29/2004	MW-91-037	FD	0.24 U	5.78 J				

Notes:

(1) Concentrations are reported in picocuries per liter (pCi/L).

(2) Sample types are as follows:

N = Primary sample; and

FD = Field duplicate sample.

(3) Data qualifiers are as follows:

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

Table A-1d. Groundwater Data Summary – Site – VOCs and TPH

Well	Date	Sample ID	Sample Type	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1,2-Trichlorotrifluoroethane (Freon 113)	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichlorobenzene	1,2,3-trichloropropane	1,2,4-trichlorobenzene	1,2,4-trimethylbenzene	1,2-dibromo-3-chloroprop	1,2-dibromoethane	1,2-dichlorobenzene	1,2-dichloroethane	1,2-dichloropropane	1,3,5-trimethylbenzene	1,3-dichlorobenzene	1,3-dichloropropane	1,4-dichlorobenzene	2,2-dichloropropane
CW-2D	02/23/2005	CW-02D-002	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
CW-2D	02/23/2005	CW-02D-002	N											10 U				10 U				10 U		10 U	
MW-10	06/10/2004	MW-10-030	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW-10	06/10/2004	MW-10-030	N											10 U				10 U				10 U		10 U	
MW-10	05/03/2007	MW-10-125	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	9.4 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
MW-10	05/03/2007	MW-10-125	N											1 UJ				9.4 UJ				9.4 UJ		9.4 U	
MW-10	05/03/2007	MW-96-125	FD	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 UJ	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
MW-10	05/03/2007	MW-96-125	FD											9.4 U				9.4 UJ				9.4 UJ		9.4 U	
MW-11	06/10/2004	MW-11-030	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
MW-11	06/10/2004	MW-11-030	N											10 U				10 U				10 U		10 U	
MW-11	05/03/2007	MW-11-125	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	9.5 UJ	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
MW-11	05/03/2007	MW-11-125	N											1 UJ				9.5 UJ				9.5 UJ		9.5 U	
MW-12	06/09/2004	MW-12-030	N											10 U				10 U				10 U		10 U	
MW-12	06/09/2004	MW-12-030	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW-12	06/09/2004	MW-92-030	FD	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	1 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW-12	06/09/2004	MW-92-030	FD											0.5 U				10 U				10 U		10 U	
MW-12	05/03/2007	MW-12-125	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	11 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
MW-12	05/03/2007	MW-12-125	N											1 UJ				11 UJ				11 UJ		11 U	
MW-20-70	05/03/2007	MW-20-070-125	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	9.4 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
MW-20-70	05/03/2007	MW-20-070-125	N											1 UJ				9.4 UJ				9.4 UJ		9.4 U	
MW-20-100	05/03/2007	MW-20-100-125	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	9.6 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
MW-20-100	05/03/2007	MW-20-100-125	N											1 UJ				9.6 UJ				9.6 UJ		9.6 U	
MW-20-130	05/03/2007	MW-20-130-125	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	9.5 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
MW-20-130	05/03/2007	MW-20-130-125	N											1 UJ				9.5 UJ				9.5 UJ		9.5 U	
MW-24A	07/18/2007	MW-24A-125	N																						
MW-25	06/09/2004	MW-25-030	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U	1 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	10 U	0.5 U	0.5 U	0.5 U
MW-25	06/09/2004	MW-25-030	N											0.5 U				10 U				0.5 U		10 U	
MW-25	05/04/2007	MW-25-125	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 UJ	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
MW-25	05/04/2007	MW-25-125	N											10 U				10 UJ				10 UJ		10 U	
MW-34-55	06/08/2004	MW-34-55-030	N											10 U				10 U				10 U		10 U	
MW-34-55	06/23/2004	MW-34-55-030R	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW-34-80	06/08/2004	MW-34-80-030	N											10 U				10 U				10 U		10 U	
MW-34-80	06/23/2004	MW-34-80-030R	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW-37D	06/11/2004	MW-37D-030	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	10 U	0.5 UJ	0.5 U	0.5 U	10 U	0.5 U	10 U	0.5 U
MW-37D	06/11/2004	MW-37D-030	N											10 U				0.5 U				0.5 U		0.5 U	
OW-1D	09/30/2004	OW-1D	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
OW-1D	09/30/2004	OW-1D	N											10 U				10 U				10 U		10 U	
OW-1D	05/10/2005	OW-1D-WQ6	N	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ			1 UJ	1 UJ	1 UJ	2 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ		1 UJ	
OW-1D	05/10/2005	OW-1D-WQ6	N											9.9 U				9.9 U				9.9 U		9.9 U	
OW-1M	05/10/2005	OW-1M-WQ6	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
OW-1M	05/10/2005	OW-1M-WQ6	N											10 U				10 U				10 U		10 U	
OW-1S	07/28/2005	MW-90-075	FD	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
OW-1S	07/28/2005	MW-90-075	FD											9.9 U				9.9 U				9.9 U		9.9 U	
OW-1S	07/28/2005	OW-01S-075	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 U	2 U	1 U	9.5 U	1 U	1 U	1 U	1 U		1 U	
OW-1S	07/28/2005	OW-01S-075	N											9.5 U				1 U				9.5 U		9.5 U	
OW-2D	05/10/2005	OW-2D-WQ6	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
OW-2D	05/10/2005	OW-2D-WQ6	N											9.8 U				9.8 U				9.8 U		9.8 U	
OW-2M	05/11/2005	OW-2M-WQ6	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
OW-2M	05/11/2005	OW-2M-WQ6	N											9.5 U				9.5 U				9.5 U		9.5 U	
OW-2S	07/28/2005	OW-02S-075	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
OW-2S	07/28/2005	OW-02S-075	N											9.5 U				9.5 U				9.5 U		9.5 U	

Table A-1d. Groundwater Data Summary – Site – VOCs and TPH

Well	Date	Sample ID	Sample Type	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2-chloroethyl vinyl ether	2-chlorotoluene (o-chloro	2-hexanone	4-isopropyltoluene	Acetone	Acrolein	Acrylonitrile	Benzene	Bis(2-chloroethyl)ether	Bis(2-chloroisopropyl)eth	Braomochloromethane	Bromobenzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene
CW-2D	02/23/2005	CW-02D-002	N	10 U	10 U		1 U					10 U	1 U	10 U	10 U		1 U	1 U	1 U	1 U	1 U	1 U	1 U
CW-2D	02/23/2005	CW-02D-002	N																				
MW-10	06/10/2004	MW-10-030	N	10 U	10 U	0.5 U	0.5 U	10 U	0.5 U	10 U		10 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
MW-10	06/10/2004	MW-10-030	N																				
MW-10	05/03/2007	MW-10-125	N	47 UJ	9.4 UJ		1 U			10 U	20 UJ	20 U	1 U	9.4 UJ	9.4 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-10	05/03/2007	MW-10-125	N																				
MW-10	05/03/2007	MW-96-125	FD	47 UJ	9.4 UJ		1 U			10 U	20 UJ	20 U	1 U	9.4 UJ	9.4 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-10	05/03/2007	MW-96-125	FD																				
MW-11	06/10/2004	MW-11-030	N	10 U	10 U	0.5 U	0.5 U	10 U	0.5 U	10 UJ		10 UJ	0.5 U	10 U	10 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U
MW-11	06/10/2004	MW-11-030	N																				
MW-11	05/03/2007	MW-11-125	N	47 UJ	9.5 UJ		1 U			10 U	20 UJ	20 U	1 U	9.5 UJ	9.5 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-11	05/03/2007	MW-11-125	N																				
MW-12	06/09/2004	MW-12-030	N																				
MW-12	06/09/2004	MW-12-030	N	10 U	10 U	0.5 U	0.5 U	10 U	0.5 U	10 U		10 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
MW-12	06/09/2004	MW-92-030	FD	10 U	10 U	0.5 U	0.5 U	10 U	0.5 U	10 U		10 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
MW-12	06/09/2004	MW-92-030	FD																				
MW-12	05/03/2007	MW-12-125	N	55 UJ	11 UJ		1 U			10 U	20 UJ	20 U	1 U	11 UJ	11 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-12	05/03/2007	MW-12-125	N																				
MW-20-70	05/03/2007	MW-20-070-125	N	47 UJ	9.4 UJ		1 U			10 U	20 UJ	20 U	1 U	9.4 UJ	9.4 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-20-70	05/03/2007	MW-20-070-125	N																				
MW-20-100	05/03/2007	MW-20-100-125	N	48 UJ	9.6 UJ		1 U			10 U	20 UJ	20 U	1 U	9.6 UJ	9.6 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-20-100	05/03/2007	MW-20-100-125	N																				
MW-20-130	05/03/2007	MW-20-130-125	N	47 UJ	9.5 UJ		1 U			10 U	20 UJ	20 U	1 U	9.5 UJ	9.5 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-20-130	05/03/2007	MW-20-130-125	N																				
MW-24A	07/18/2007	MW-24A-125	N																				
MW-25	06/09/2004	MW-25-030	N	10 U	10 U	0.5 U	0.5 U	10 U	0.5 U	10 U		10 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
MW-25	06/09/2004	MW-25-030	N																				
MW-25	05/04/2007	MW-25-125	N	50 UJ	10 UJ		1 U			10 UJ	20 UJ	20 UJ	1 U	10 UJ	10 UJ		1 U	1 U	1 U	1 UJ	1 U	1 U	1 U
MW-25	05/04/2007	MW-25-125	N																				
MW-34-55	06/08/2004	MW-34-55-030	N	10 U	10 U									10 U	10 U								
MW-34-55	06/23/2004	MW-34-55-030R	N			1 U	0.5 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW-34-80	06/08/2004	MW-34-80-030	N	10 U	10 U									10 U	10 U								
MW-34-80	06/23/2004	MW-34-80-030R	N			1 U	0.5 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U			0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
MW-37D	06/11/2004	MW-37D-030	N	10 U	10 U	0.5 U	0.5 U	10 U	0.5 U	10 U		10 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
MW-37D	06/11/2004	MW-37D-030	N																				
OW-1D	09/30/2004	OW-1D	N	10 U	10 U	0.5 UJ	0.5 U	10 UJ	0.5 U	10 U		10 UJ	0.8	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.7	0.5 U	0.5 U
OW-1D	09/30/2004	OW-1D	N																				
OW-1D	05/10/2005	OW-1D-WQ6	N	9.9 U	9.9 U		1 UJ			10 UJ	10 UJ	10 UJ	1 UJ	9.9 U	9.9 UJ		1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
OW-1D	05/10/2005	OW-1D-WQ6	N																				
OW-1M	05/10/2005	OW-1M-WQ6	N	10 U	10 U		1 U			10 U	10 U	10 U	1 U	10 U	10 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
OW-1M	05/10/2005	OW-1M-WQ6	N																				
OW-1S	07/28/2005	MW-90-075	FD	9.9 U	9.9 U		1 U			10 U		10 U	1 U	9.9 U	9.9 U		1 U	1 U	1 U	1 U	1 U	1 U	1 U
OW-1S	07/28/2005	MW-90-075	FD																				
OW-1S	07/28/2005	OW-01S-075	N	9.5 U	9.5 U		1 U			10 U		10 U	1 U	9.5 U	9.5 U		1 U	1 U	1 U	1 U	1 U	1 U	1 U
OW-1S	07/28/2005	OW-01S-075	N																				
OW-2D	05/10/2005	OW-2D-WQ6	N	9.8 U	9.8 U		1 U			10 U	10 U	10 U	1 U	9.8 U	9.8 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
OW-2D	05/10/2005	OW-2D-WQ6	N																				
OW-2M	05/11/2005	OW-2M-WQ6	N	9.5 U	9.5 U		1 U			10 U	10 U	10 U	1 U	9.5 U	9.5 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
OW-2M	05/11/2005	OW-2M-WQ6	N																				
OW-2S	07/28/2005	OW-02S-075	N	9.5 U	9.5 U		1 U			10 U		10 U	1 U	9.5 U	9.5 U		1 U	1 U	1 U	1 U	1 U	1 U	1 U
OW-2S	07/28/2005	OW-02S-075	N																				

Table A-1d. Groundwater Data Summary – Site – VOCs and TPH

Well	Date	Sample ID	Sample Type	Chloroethane	Chloroform	Chloromethane	Cis-1,2-dichloroethene	Cis-1,3-dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Dichlorotrifluoromethane	Ethylbenzene	Hexachlorobutadiene	Hexachlorocyclopentadie	Iodomethane	Isobutyl Alcohol	Isophorone	Isopropylbenzene	M+p-xylenes	Methyl Ethyl Ketone	Methyl isobutyl ketone	Methyl t-butyl ether (mtbe	Methylene chloride	N-butylbenzene
CW-2D	02/23/2005	CW-02D-002	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	10 U				10 U	1 U	1 U	10 U	10 U	1 U	1 U	1 U
CW-2D	02/23/2005	CW-02D-002	N																						
MW-10	06/10/2004	MW-10-030	N	0.5 U	0.8	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	10 U	0.5 U		10 U	0.5 U		10 U	10 U	0.5 U	0.5 U	0.5 U
MW-10	06/10/2004	MW-10-030	N											10 U											
MW-10	05/03/2007	MW-10-125	N	1 U	1.1	1 U	1 U		1 U		1 U		1 U	9.4 UJ			80 U	9.4 UJ	1 U	1 U	10 U	10 U	1 U	5 U	1 UJ
MW-10	05/03/2007	MW-10-125	N																						
MW-10	05/03/2007	MW-96-125	FD	1 U	1 U	1 U	1 U		1 U		1 U		1 U	9.4 UJ			80 U	9.4 UJ	1 U	1 U	10 U	10 U	1 U	5 U	1 UJ
MW-10	05/03/2007	MW-96-125	FD																						
MW-11	06/10/2004	MW-11-030	N	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.5 U	10 U	0.5 UJ		10 U	0.5 U		10 UJ	10 U	0.5 UJ	0.5 UJ	0.5 U
MW-11	06/10/2004	MW-11-030	N											10 U											
MW-11	05/03/2007	MW-11-125	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	9.5 UJ			80 U	9.5 UJ	1 U	1 U	10 U	10 U	1 U	5 U	1 UJ
MW-11	05/03/2007	MW-11-125	N																						
MW-12	06/09/2004	MW-12-030	N											10 U											
MW-12	06/09/2004	MW-12-030	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	10 U	0.5 U		10 U	0.5 U		10 U	10 U	0.5 U	0.5 U	0.5 U
MW-12	06/09/2004	MW-92-030	FD	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	10 U	0.5 U		10 U	0.5 U		10 U	10 U	0.5 U	0.5 U	0.5 U
MW-12	06/09/2004	MW-92-030	FD											10 U											
MW-12	05/03/2007	MW-12-125	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	11 UJ			80 U	11 UJ	1 U	1 U	10 U	10 U	1 U	5 U	1 UJ
MW-12	05/03/2007	MW-12-125	N																						
MW-20-70	05/03/2007	MW-20-070-125	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	9.4 UJ			80 U	9.4 UJ	1 U	1 U	10 U	10 U	1 U	5 U	1 UJ
MW-20-70	05/03/2007	MW-20-070-125	N																						
MW-20-100	05/03/2007	MW-20-100-125	N	1 U	1.3	1 U	1 U		1 U		1 U		1 U	9.6 UJ			80 U	9.6 UJ	1 U	1 U	10 U	10 U	1 U	5 U	1 UJ
MW-20-100	05/03/2007	MW-20-100-125	N																						
MW-20-130	05/03/2007	MW-20-130-125	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	9.5 UJ			80 U	9.5 UJ	1 U	1 U	10 U	10 U	1 U	5 U	1 UJ
MW-20-130	05/03/2007	MW-20-130-125	N																						
MW-24A	07/18/2007	MW-24A-125	N																						
MW-25	06/09/2004	MW-25-030	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	10 U	10 U	0.5 U		10 U	0.5 U		10 U	10 U	0.5 U	0.5 U	0.5 U
MW-25	06/09/2004	MW-25-030	N											0.5 U											
MW-25	05/04/2007	MW-25-125	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	10 UJ			80 U	10 UJ	1 U	1 U	10 U	10 U	1 U	5 U	1 U
MW-25	05/04/2007	MW-25-125	N																						
MW-34-55	06/08/2004	MW-34-55-030	N											10 U	10 U			10 U							
MW-34-55	06/23/2004	MW-34-55-030R	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U		0.5 U			0.5 U		10 U	10 U	0.5 U	0.5 U	0.5 U
MW-34-80	06/08/2004	MW-34-80-030	N											10 U	10 U			10 U							
MW-34-80	06/23/2004	MW-34-80-030R	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U		0.5 U			0.5 U		10 U	10 U	0.5 U	0.5 U	0.5 U
MW-37D	06/11/2004	MW-37D-030	N	0.5 U	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	10 U	0.5 U		10 U	0.5 U		10 U	10 U	0.5 U	0.5 U	0.5 U
MW-37D	06/11/2004	MW-37D-030	N											10 U											
OW-1D	09/30/2004	OW-1D	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	10 UJ	0.5 U		10 U	0.5 U		10 UJ	10 U	0.5 U	0.5 U	0.5 U
OW-1D	09/30/2004	OW-1D	N											10 U											
OW-1D	05/10/2005	OW-1D-WQ6	N	1 UJ	1 UJ	1 UJ	1 UJ		1 UJ		1 UJ		1 UJ	9.9 U				9.9 U	1 UJ	1 UJ	10 UJ	10 UJ	1 UJ	1 UJ	1 UJ
OW-1D	05/10/2005	OW-1D-WQ6	N																						
OW-1M	05/10/2005	OW-1M-WQ6	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	10 U				10 U	1 U	1 U	10 U	10 U	1 U	1 U	1 U
OW-1M	05/10/2005	OW-1M-WQ6	N																						
OW-1S	07/28/2005	MW-90-075	FD	1 U	1 U	1 U	1 U		1 U		1 U		1 U	9.9 U				9.9 U	1 U	1 U	10 U	10 U	1 U	1 U	1 U
OW-1S	07/28/2005	MW-90-075	FD																						
OW-1S	07/28/2005	OW-01S-075	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	9.5 U				9.5 U	1 U	1 U	10 U	10 U	1 U	1 U	1 U
OW-1S	07/28/2005	OW-01S-075	N																						
OW-2D	05/10/2005	OW-2D-WQ6	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	9.8 U				9.8 U	1 U	1 U	10 U	10 U	1 U	1 U	1 U
OW-2D	05/10/2005	OW-2D-WQ6	N																						
OW-2M	05/11/2005	OW-2M-WQ6	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	9.5 U				9.5 U	1 U	1 U	10 U	10 U	1 U	1 U	1 U
OW-2M	05/11/2005	OW-2M-WQ6	N																						
OW-2S	07/28/2005	OW-02S-075	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	9.5 U				9.5 U	1 U	1 U	10 U	10 U	1 U	1 U	1 U
OW-2S	07/28/2005	OW-02S-075	N																						

Table A-1d. Groundwater Data Summary – Site – VOCs and TPH

Well	Date	Sample ID	Sample Type	Nitrobenzene	N-propylbenzene	O-xylene	P-chlorotoluene	Sec-butylbenzene	Styrene	T-butylbenzene	Tetrachloroethene	Toluene	Total xylenes	TPH as diesel	TPh as gasoline	TPH as motor oil	Trans-1,2-dichloroethene	Trans-1,3-dichloropropen	Trichloroethene	Trichlorofluoromethane (Freon 11)	Vinyl acetate	Vinyl chloride
CW-2D	02/23/2005	CW-02D-002	N	10 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
CW-2D	02/23/2005	CW-02D-002	N																			
MW-10	06/10/2004	MW-10-030	N	10 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U
MW-10	06/10/2004	MW-10-030	N																			
MW-10	05/03/2007	MW-10-125	N	9.4 UJ	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U	470 U	100 U	470 U	1 U		1 U			1 U
MW-10	05/03/2007	MW-10-125	N																			
MW-10	05/03/2007	MW-96-125	FD	9.4 UJ	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U	470 U	100 U	470 U	1 U		1 U			1 U
MW-10	05/03/2007	MW-96-125	FD																			
MW-11	06/10/2004	MW-11-030	N	10 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				0.5 UJ	0.5 U	0.5 U	0.5 UJ	10 UJ	0.5 UJ
MW-11	06/10/2004	MW-11-030	N																			
MW-11	05/03/2007	MW-11-125	N	9.5 UJ	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U	470 U	100 U	470 U	1 U		1 U			1 U
MW-11	05/03/2007	MW-11-125	N																			
MW-12	06/09/2004	MW-12-030	N																			
MW-12	06/09/2004	MW-12-030	N	10 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U
MW-12	06/09/2004	MW-92-030	FD	10 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U
MW-12	06/09/2004	MW-92-030	FD																			
MW-12	05/03/2007	MW-12-125	N	11 UJ	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U	500 U	100 U	500 U	1 U		1 U			1 U
MW-12	05/03/2007	MW-12-125	N																			
MW-20-70	05/03/2007	MW-20-070-125	N	9.4 UJ	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
MW-20-70	05/03/2007	MW-20-070-125	N																			
MW-20-100	05/03/2007	MW-20-100-125	N	9.6 UJ	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
MW-20-100	05/03/2007	MW-20-100-125	N																			
MW-20-130	05/03/2007	MW-20-130-125	N	9.5 UJ	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
MW-20-130	05/03/2007	MW-20-130-125	N																			
MW-24A	07/18/2007	MW-24A-125	N											480 U	100 U	480 U						
MW-25	06/09/2004	MW-25-030	N	10 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U
MW-25	06/09/2004	MW-25-030	N																			
MW-25	05/04/2007	MW-25-125	N	10 UJ	1 U	1 U		1 UJ	1 U	1 U	1 U	1 U	2 U	500 U	100 U	500 U	1 U		1 U			1 U
MW-25	05/04/2007	MW-25-125	N																			
MW-34-55	06/08/2004	MW-34-55-030	N	10 U																		
MW-34-55	06/23/2004	MW-34-55-030R	N		0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U
MW-34-80	06/08/2004	MW-34-80-030	N	10 U																		
MW-34-80	06/23/2004	MW-34-80-030R	N		0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U
MW-37D	06/11/2004	MW-37D-030	N	10 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U
MW-37D	06/11/2004	MW-37D-030	N																			
OW-1D	09/30/2004	OW-1D	N	10 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.1	0.5 U				0.5 U	0.5 U	0.5 U	0.5 U	10 UJ	0.5 U
OW-1D	09/30/2004	OW-1D	N																			
OW-1D	05/10/2005	OW-1D-WQ6	N	9.9 U	1 UJ	1 UJ		1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	2 UJ				1 UJ		1 UJ			1 UJ
OW-1D	05/10/2005	OW-1D-WQ6	N																			
OW-1M	05/10/2005	OW-1M-WQ6	N	10 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
OW-1M	05/10/2005	OW-1M-WQ6	N																			
OW-1S	07/28/2005	MW-90-075	FD	9.9 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
OW-1S	07/28/2005	MW-90-075	FD																			
OW-1S	07/28/2005	OW-01S-075	N	9.5 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
OW-1S	07/28/2005	OW-01S-075	N																			
OW-2D	05/10/2005	OW-2D-WQ6	N	9.8 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
OW-2D	05/10/2005	OW-2D-WQ6	N																			
OW-2M	05/11/2005	OW-2M-WQ6	N	9.5 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
OW-2M	05/11/2005	OW-2M-WQ6	N																			
OW-2S	07/28/2005	OW-02S-075	N	9.5 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
OW-2S	07/28/2005	OW-02S-075	N																			

Table A-1d. Groundwater Data Summary – Site – VOCs and TPH

Well	Date	Sample ID	Sample Type	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1,2-Trichlorotrifluoroethane (Freon 113)	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichlorobenzene	1,2,3-trichloropropane	1,2,4-trichlorobenzene	1,2,4-trimethylbenzene	1,2-dibromo-3-chloroprop	1,2-dibromoethane	1,2-dichlorobenzene	1,2-dichloroethane	1,2-dichloropropane	1,3,5-trimethylbenzene	1,3-dichlorobenzene	1,3-dichloropropane	1,4-dichlorobenzene	2,2-dichloropropane
OW-5D	05/11/2005	OW-5D-WQ6	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
OW-5D	05/11/2005	OW-5D-WQ6	N											10 U				10 U				10 U		10 U	
OW-5M	05/11/2005	OW-5M-WQ6	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
OW-5M	05/11/2005	OW-5M-WQ6	N											11 U				11 U				11 U		11 U	
OW-5S	05/11/2005	OW-5S-WQ6	N	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
OW-5S	05/11/2005	OW-5S-WQ6	N											9.8 U				9.8 U				9.8 U		9.8 U	
OW-5S	05/11/2005	OW-91-WQ6	FD	1 U	1 U	1 U	1 U	1 U	1 U	1 U			1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U		1 U	
OW-5S	05/11/2005	OW-91-WQ6	FD											9.8 U				9.8 U				9.8 U		9.8 U	
TW-2D	07/29/2004	TW-2D-037Q	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TW-2D	07/29/2004	TW-2D-037Q	N											10 U				10 U				10 U		10 U	
TW-2S	07/29/2004	TW-2S-037Q	N											10 U				10 U				10 U		10 U	
TW-2S	07/29/2004	TW-2S-037Q	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L).

(2) Sample types are as follows:

N = Primary sample; and

FD = Field duplicate sample.

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table A-1d. Groundwater Data Summary – Site – VOCs and TPH

Well	Date	Sample ID	Sample Type	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2-chloroethyl vinyl ether	2-chlorotoluene (o-chloro	2-hexanone	4-isopropyltoluene	Acetone	Acrolein	Acrylonitrile	Benzene	Bis(2-chloroethyl)ether	Bis(2-chloroisopropyl)eth	Braomochloromethane	Bromobenzene	Bromodichloromethane	Bromoform	Bromomethane	Carbon disulfide	Carbon tetrachloride	Chlorobenzene
OW-5D	05/11/2005	OW-5D-WQ6	N	10 U	10 U		1 U			10 U	10 U	10 U	1 U	10 U	10 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
OW-5D	05/11/2005	OW-5D-WQ6	N																				
OW-5M	05/11/2005	OW-5M-WQ6	N	11 U	11 U		1 U			10 U	10 U	10 U	1 U	11 U	11 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
OW-5M	05/11/2005	OW-5M-WQ6	N																				
OW-5S	05/11/2005	OW-5S-WQ6	N	9.8 U	9.8 U		1 U			10 U	10 U	10 U	1 U	9.8 U	9.8 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
OW-5S	05/11/2005	OW-5S-WQ6	N																				
OW-5S	05/11/2005	OW-91-WQ6	FD	9.8 U	9.8 U		1 U			10 U	10 U	10 U	1 U	9.8 U	9.8 UJ		1 U	1 U	1 U	1 U	1 U	1 U	1 U
OW-5S	05/11/2005	OW-91-WQ6	FD																				
TW-2D	07/29/2004	TW-2D-037Q	N	10 U	10 U	0.5 U	0.5 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
TW-2D	07/29/2004	TW-2D-037Q	N																				
TW-2S	07/29/2004	TW-2S-037Q	N																				
TW-2S	07/29/2004	TW-2S-037Q	N	10 U	10 U	0.5 U	0.5 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U	10 U	10 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L).

(2) Sample types are as follows:

N = Primary sample; and

FD = Field duplicate sample.

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table A-1d. Groundwater Data Summary – Site – VOCs and TPH

Well	Date	Sample ID	Sample Type	Chloroethane	Chloroform	Chloromethane	Cis-1,2-dichloroethene	Cis-1,3-dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Dichlorotrifluoromethane	Ethylbenzene	Hexachlorobutadiene	Hexachlorocyclopentadie	Iodomethane	Isobutyl Alcohol	Isophorone	Isopropylbenzene	M+p-xylenes	Methyl Ethyl Ketone	Methyl isobutyl ketone	Methyl t-butyl ether (mtbe	Methylene chloride	N-butylbenzene
OW-5D	05/11/2005	OW-5D-WQ6	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	10 U				10 U	1 U	1 U	10 U	10 U	1 U	1 U	1 U
OW-5D	05/11/2005	OW-5D-WQ6	N																						
OW-5M	05/11/2005	OW-5M-WQ6	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	11 U				11 U	1 U	1 U	10 U	10 U	1 U	1 U	1 U
OW-5M	05/11/2005	OW-5M-WQ6	N																						
OW-5S	05/11/2005	OW-5S-WQ6	N	1 U	1 U	1 U	1 U		1 U		1 U		1 U	9.8 U				9.8 U	1 U	1 U	10 U	10 U	1 U	1 U	1 U
OW-5S	05/11/2005	OW-5S-WQ6	N																						
OW-5S	05/11/2005	OW-91-WQ6	FD	1 U	1 U	1 U	1 U		1 U		1 U		1 U	9.8 U				9.8 U	1 U	1 U	10 U	10 U	1 U	1 U	1 U
OW-5S	05/11/2005	OW-91-WQ6	FD																						
TW-2D	07/29/2004	TW-2D-037Q	N	0.5 U	0.8	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U		10 U	0.5 U		10 U	10 U	0.5 U	0.5 U	0.5 U
TW-2D	07/29/2004	TW-2D-037Q	N											10 U											
TW-2S	07/29/2004	TW-2S-037Q	N											10 U											
TW-2S	07/29/2004	TW-2S-037Q	N	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U		10 U	0.5 U		10 U	10 U	0.5 U	0.5 U	0.5 U

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L).

(2) Sample types are as follows:

N = Primary sample; and

FD = Field duplicate sample.

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table A-1d. Groundwater Data Summary – Site – VOCs and TPH

Well	Date	Sample ID	Sample Type	Nitrobenzene	N-propylbenzene	O-xylene	P-chlorotoluene	Sec-butylbenzene	Styrene	T-butylbenzene	Tetrachloroethene	Toluene	Total xylenes	TPH as diesel	TPh as gasoline	TPH as motor oil	Trans-1,2-dichloroethene	Trans-1,3-dichloropropen	Trichloroethene	Trichlorofluoromethane (Freon 11)	Vinyl acetate	Vinyl chloride
OW-5D	05/11/2005	OW-5D-WQ6	N	10 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
OW-5D	05/11/2005	OW-5D-WQ6	N																			
OW-5M	05/11/2005	OW-5M-WQ6	N	11 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
OW-5M	05/11/2005	OW-5M-WQ6	N																			
OW-5S	05/11/2005	OW-5S-WQ6	N	9.8 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
OW-5S	05/11/2005	OW-5S-WQ6	N																			
OW-5S	05/11/2005	OW-91-WQ6	FD	9.8 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U	2 U				1 U		1 U			1 U
OW-5S	05/11/2005	OW-91-WQ6	FD																			
TW-2D	07/29/2004	TW-2D-037Q	N	10 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U
TW-2D	07/29/2004	TW-2D-037Q	N																			
TW-2S	07/29/2004	TW-2S-037Q	N																			
TW-2S	07/29/2004	TW-2S-037Q	N	10 U	0.5 U		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				0.5 U	0.5 U	0.5 U	0.5 U	10 U	0.5 U

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L).

(2) Sample types are as follows:

N = Primary sample; and

FD = Field duplicate sample.

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table A-1e. Groundwater Data Summary – Site – SVOCs

Well	Date	Sample ID	Sample Type	2,4-dichlorophenol	2,4-dimethylphenol	2,4-dinitrophenol	2,4-dinitrotoluene	2,6-dinitrotoluene	2-Chloronaphthalene	2-chlorophenol	2-methylphenol	2-nitroaniline	2-nitrophenol	3,3'-dichlorobenzidene	3-nitroaniline	4,6-dinitro-2-methylphenol	4-bromophenyl phenyl ether	4-chloro-3-methylphenol	4-chloroaniline	4-chlorophenyl phenyl ether	4-methylphenol	4-nitroaniline	4-nitrophenol	Aniline	Azobenzene	Benzidene	Benzoic acid
CW-2D	02/23/2005	CW-02D-002	N	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U		10 U	10 U	20 U			10 U		10 U	10 U	20 U				
MW-10	06/10/2004	MW-10-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	30 U	10 U	10 U	30 UJ	30 U
MW-10	05/03/2007	MW-10-125	N	9.4 UJ	9.4 UJ	19 UJ	9.4 U	9.4 UJ	47 UJ	9.4 U	47 UJ	47 UJ		9.4 UJ	47 UJ	19 UJ			19 UJ		47 UJ	47 UJ	47 U				
MW-10	05/03/2007	MW-96-125	FD	9.4 UJ	9.4 UJ	19 UJ	9.4 U	9.4 UJ	47 UJ	9.4 U	47 UJ	47 UJ		9.4 UJ	47 UJ	19 UJ			19 UJ		47 UJ	47 UJ	47 U				
MW-11	06/10/2004	MW-11-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	30 U	10 U	10 U	30 UJ	30 U
MW-11	05/03/2007	MW-11-125	N	9.5 UJ	9.5 UJ	19 UJ	9.5 U	9.5 UJ	47 UJ	9.5 UJ	47 UJ	47 UJ		9.5 UJ	47 UJ	19 UJ			19 UJ		47 UJ	47 UJ	47 U				
MW-12	06/09/2004	MW-12-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	30 U	10 U	10 U	30 UJ	30 U
MW-12	06/09/2004	MW-92-030	FD	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	30 U	10 U	10 U	30 UJ	30 U
MW-12	05/03/2007	MW-12-125	N	11 UJ	11 UJ	22 UJ	11 U	11 UJ	55 UJ	11 U	55 UJ	55 UJ		11 UJ	55 UJ	22 UJ			22 UJ		55 UJ	55 UJ	55 U				
MW-20-70	05/03/2007	MW-20-070-125	N	9.4 UJ	9.4 UJ	19 UJ	9.4 U	9.4 UJ	47 UJ	9.4 U	47 UJ	47 UJ		9.4 UJ	47 UJ	19 UJ			19 UJ		47 UJ	47 UJ	47 U				
MW-20-100	05/03/2007	MW-20-100-125	N	9.6 UJ	9.6 UJ	19 UJ	9.6 U	9.6 UJ	48 UJ	9.6 U	48 UJ	48 UJ		9.6 UJ	48 UJ	19 UJ			19 UJ		48 UJ	48 UJ	48 U				
MW-20-130	05/03/2007	MW-20-130-125	N	9.5 UJ	9.5 UJ	19 UJ	9.5 U	9.5 UJ	47 UJ	9.5 U	47 UJ	47 UJ		9.5 UJ	47 UJ	19 UJ			19 UJ		47 UJ	47 UJ	47 U				
MW-25	06/09/2004	MW-25-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	30 U	10 U	10 U	30 UJ	30 U
MW-25	05/04/2007	MW-25-125	N	10 UJ	10 UJ	20 UJ	10 U	10 UJ	50 UJ	10 U	50 UJ	50 UJ		10 UJ	50 UJ	20 UJ			20 UJ		50 UJ	50 UJ	50 U				
MW-34-55	06/08/2004	MW-34-55-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	30 U	10 U	10 U	30 UJ	30 U
MW-34-55	06/23/2004	MW-34-55-030R	N																								
MW-34-80	06/08/2004	MW-34-80-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	30 U	10 U	10 U	30 UJ	30 U
MW-34-80	06/23/2004	MW-34-80-030R	N																								
MW-37D	06/11/2004	MW-37D-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	30 U	10 U	10 U	30 UJ	30 U
OW-1D	09/30/2004	OW-1D	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	30 U	10 U	10 U	30 UJ	30 U
OW-1D	05/10/2005	OW-1D-WQ6	N	9.9 U	9.9 U	20 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U		9.9 U	9.9 U	20 U			9.9 U		9.9 U	9.9 U	20 U				
OW-1M	05/10/2005	OW-1M-WQ6	N	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U		10 U	10 U	20 U			10 U		10 U	10 U	20 U				
OW-1S	07/28/2005	MW-90-075	FD	9.9 U	9.9 U	20 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U		9.9 U	9.9 U	20 U			9.9 U		9.9 U	9.9 U	20 U				
OW-1S	07/28/2005	OW-01S-075	N	9.5 U	9.5 U	19 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	19 U			9.5 U		9.5 U	9.5 U	19 U				
OW-2D	05/10/2005	OW-2D-WQ6	N	9.8 U	9.8 U	20 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	20 U			9.8 U		9.8 U	9.8 U	20 U				
OW-2M	05/11/2005	OW-2M-WQ6	N	9.5 U	9.5 U	19 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	19 U			9.5 U		9.5 U	9.5 U	19 U				
OW-2S	07/28/2005	OW-02S-075	N	9.5 U	9.5 U	19 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	19 U			9.5 U		9.5 U	9.5 U	19 U				
OW-5D	05/11/2005	OW-5D-WQ6	N	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	10 U		10 U	10 U	20 U			10 U		10 U	10 U	20 U				
OW-5M	05/11/2005	OW-5M-WQ6	N	11 U	11 U	22 U	11 U	11 U	11 U	11 U	11 U	11 U		11 U	11 U	22 U			11 U		11 U	11 U	22 U				
OW-5S	05/11/2005	OW-5S-WQ6	N	9.8 U	9.8 U	20 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	20 U			9.8 U		9.8 U	9.8 U	20 U				
OW-5S	05/11/2005	OW-91-WQ6	FD	9.8 U	9.8 U	20 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	20 U			9.8 U		9.8 U	9.8 U	20 U				
TW-2D	07/29/2004	TW-2D-037Q	N	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	30 U	10 U	10 U	30 UJ	30 U
TW-2S	07/29/2004	TW-2S-037Q	N	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	30 U	10 U	10 U	30 UJ	30 U

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L).

(2) Sample types are as follows:

N = Primary sample; and

FD = Field duplicate sample.

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

SVOC = semivolatile organic compound

Table A-1e. Groundwater Data Summary – Site – SVOCs

Well	Date	Sample ID	Sample Type	Benzyl alcohol	Bis (2-chloroethoxy) methane	Bis (2-ethylhexyl) phthalate	Butyl benzyl phthalate	dibenzofuran	diethyl phthalate	Di-isopropyl ether	dimethyl phthalate	Di-N-butyl phthalate	Di-N-octyl phthalate	Ethyl-t-butyl ether	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachloroethane	N-Nitrosodimethylamine	N-Nitroso-di-n-propylamine	N-nitrosodiphenylamine	Pentachlorophenol/pcp	Phenanthrene	Phenol	T-amyl methyl ether	T-butyl alcohol
CW-2D	02/23/2005	CW-02D-002	N			10 U	10 U	10 U	10 U		10 U	10 U	10 U		10 U	10 U	10 U	10 U		10 U	10 U	20 U	10 U	10 U		
MW-10	06/10/2004	MW-10-030	N	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	5 U
MW-10	05/03/2007	MW-10-125	N			9.4 UJ	19 UJ	9.4 UJ	19 UJ		9.4 UJ	19 UJ	9.4 UJ		9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ		9.4 U	9.4 UJ	19 U	9.4 UJ	9.4 U		
MW-10	05/03/2007	MW-96-125	FD			9.4 UJ	19 UJ	9.4 UJ	19 UJ		9.4 UJ	19 UJ	9.4 UJ		9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ		9.4 U	9.4 UJ	19 U	9.4 UJ	9.4 U		
MW-11	06/10/2004	MW-11-030	N	10 U	10 U	10 U	10 U	10 U	10 U	0.5 UJ	10 U	10 U	10 U	0.5 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	5 U
MW-11	05/03/2007	MW-11-125	N			9.5 UJ	19 UJ	9.5 UJ	19 UJ		9.5 UJ	19 UJ	9.5 UJ		9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ		9.5 U	9.5 UJ	19 U	9.5 UJ	9.5 U		
MW-12	06/09/2004	MW-12-030	N	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	5 U
MW-12	06/09/2004	MW-92-030	FD	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	5 U
MW-12	05/03/2007	MW-12-125	N			11 UJ	22 UJ	11 UJ	22 UJ		11 UJ	22 UJ	11 UJ		11 UJ	11 UJ	11 UJ	11 UJ		11 U	11 UJ	22 U	11 UJ	11 U		
MW-20-70	05/03/2007	MW-20-070-125	N			9.4 UJ	19 UJ	9.4 UJ	19 UJ		9.4 UJ	19 UJ	9.4 UJ		9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ		9.4 U	9.4 UJ	19 U	9.4 UJ	9.4 U		
MW-20-100	05/03/2007	MW-20-100-125	N			9.6 UJ	19 UJ	9.6 UJ	19 UJ		9.6 UJ	19 UJ	9.6 UJ		9.6 UJ	9.6 UJ	9.6 UJ	9.6 UJ		9.6 U	9.6 UJ	19 U	9.6 UJ	9.6 U		
MW-20-130	05/03/2007	MW-20-130-125	N			9.5 UJ	19 UJ	9.5 UJ	19 UJ		9.5 UJ	19 UJ	9.5 UJ		9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ		9.5 U	9.5 UJ	19 U	9.5 UJ	9.5 U		
MW-25	06/09/2004	MW-25-030	N	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	5 U
MW-25	05/04/2007	MW-25-125	N			10 UJ	20 UJ	10 UJ	20 UJ		10 UJ	20 UJ	10 UJ		10 UJ	10 UJ	10 UJ	10 UJ		10 U	10 UJ	20 U	10 UJ	10 U		
MW-34-55	06/08/2004	MW-34-55-030	N	10 U	10 U	10 U	10 U	10 U	10 U		10 U	10 U	10 U		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U		
MW-34-55	06/23/2004	MW-34-55-030R	N							0.5 U				0.5 U											0.5 U	5 U
MW-34-80	06/08/2004	MW-34-80-030	N	10 U	10 U	10 U	10 U	10 U	10 U		10 U	10 U	10 U		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U		
MW-34-80	06/23/2004	MW-34-80-030R	N							0.5 U				0.5 U											0.5 U	5 U
MW-37D	06/11/2004	MW-37D-030	N	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	5 U
OW-1D	09/30/2004	OW-1D	N	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	
OW-1D	05/10/2005	OW-1D-WQ6	N			9.9 U	9.9 U	9.9 U	9.9 U		9.9 U	9.9 U	9.9 U		9.9 U	9.9 U	9.9 U	9.9 U		9.9 U	9.9 U	20 U	9.9 U	9.9 U		
OW-1M	05/10/2005	OW-1M-WQ6	N			10 U	10 U	10 U	10 U		10 U	10 U	10 U		10 U	10 U	10 U	10 U		10 U	10 U	20 U	10 U	10 U		
OW-1S	07/28/2005	MW-90-075	FD			9.9 U	9.9 U	9.9 U	9.9 U		9.9 U	9.9 U	9.9 U		9.9 U	9.9 U	9.9 U	9.9 U		9.9 U	9.9 U	20 U	9.9 U	9.9 U		
OW-1S	07/28/2005	OW-01S-075	N			9.5 U	9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	19 U	9.5 U	9.5 U		
OW-2D	05/10/2005	OW-2D-WQ6	N			9.8 U	9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	20 U	9.8 U	9.8 U		
OW-2M	05/11/2005	OW-2M-WQ6	N			9.5 U	9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	19 U	9.5 U	9.5 U		
OW-2S	07/28/2005	OW-02S-075	N			9.5 U	9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	9.5 U	9.5 U		9.5 U	9.5 U	19 U	9.5 U	9.5 U		
OW-5D	05/11/2005	OW-5D-WQ6	N			10 U	10 U	10 U	10 U		10 U	10 U	10 U		10 U	10 U	10 U	10 U		10 U	10 U	20 U	10 U	10 U		
OW-5M	05/11/2005	OW-5M-WQ6	N			11 U	11 U	11 U	11 U		11 U	11 U	11 U		11 U	11 U	11 U	11 U		11 U	11 U	22 U	11 U	11 U		
OW-5S	05/11/2005	OW-5S-WQ6	N			9.8 U	9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	20 U	9.8 U	9.8 U		
OW-5S	05/11/2005	OW-91-WQ6	FD			9.8 U	9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	9.8 U	9.8 U		9.8 U	9.8 U	20 U	9.8 U	9.8 U		
TW-2D	07/29/2004	TW-2D-037Q	N	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	5 U
TW-2S	07/29/2004	TW-2S-037Q	N	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	5 U

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L).

(2) Sample types are as follows:

N = Primary sample; and

FD = Field duplicate sample.

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

SVOC = semivolatile organic compound

Table A-1f. Groundwater Data Summary – Site – PAHs

Well	Date	Sample ID	Sample Type	2-methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Naphthalene	Pyrene
CW-2D	02/23/2005	CW-02D-002	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
MW-10	06/10/2004	MW-10-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U
MW-10	06/10/2004	MW-10-030	N													10 U	
MW-10	05/03/2007	MW-10-125	N	9.4 UJ	9.4 U	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 U
MW-10	05/03/2007	MW-96-125	FD	9.4 UJ	9.4 U	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 U
MW-11	06/10/2004	MW-11-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U
MW-11	06/10/2004	MW-11-030	N													10 U	
MW-11	05/03/2007	MW-11-125	N	9.5 UJ	9.5 U	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 U
MW-12	06/09/2004	MW-12-030	N													10 U	
MW-12	06/09/2004	MW-12-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U
MW-12	06/09/2004	MW-92-030	FD	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U
MW-12	06/09/2004	MW-92-030	FD													10 U	
MW-12	05/03/2007	MW-12-125	N	11 UJ	11 U	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 UJ	11 U
MW-20-70	05/03/2007	MW-20-070-125	N	9.4 UJ	9.4 U	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 UJ	9.4 U
MW-20-100	05/03/2007	MW-20-100-125	N	9.6 UJ	9.6 U	9.6 UJ	9.6 UJ	9.6 UJ	9.6 UJ	9.6 UJ	9.6 UJ	9.6 UJ	9.6 UJ	9.6 UJ	9.6 UJ	9.6 UJ	9.6 U
MW-20-130	05/03/2007	MW-20-130-125	N	9.5 UJ	9.5 U	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 UJ	9.5 U
MW-25	06/09/2004	MW-25-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
MW-25	06/09/2004	MW-25-030	N													0.5 U	
MW-25	05/04/2007	MW-25-125	N	10 UJ	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U
MW-34-55	06/08/2004	MW-34-55-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
MW-34-55	06/23/2004	MW-34-55-030R	N													0.5 U	
MW-34-80	06/08/2004	MW-34-80-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
MW-34-80	06/23/2004	MW-34-80-030R	N													0.5 U	
MW-37D	06/11/2004	MW-37D-030	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U
MW-37D	06/11/2004	MW-37D-030	N													10 U	
OW-1D	09/30/2004	OW-1D	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1 J	10 U
OW-1D	09/30/2004	OW-1D	N													10 U	
OW-1D	05/10/2005	OW-1D-WQ6	N	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U
OW-1M	05/10/2005	OW-1M-WQ6	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
OW-1S	07/28/2005	MW-90-075	FD	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U	9.9 U
OW-1S	07/28/2005	OW-01S-075	N	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U
OW-2D	05/10/2005	OW-2D-WQ6	N	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U
OW-2M	05/11/2005	OW-2M-WQ6	N	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U
OW-2S	07/28/2005	OW-02S-075	N	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U	9.5 U
OW-5D	05/11/2005	OW-5D-WQ6	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Table A-1f. Groundwater Data Summary – Site – PAHs

Well	Date	Sample ID	Sample Type	2-methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Naphthalene	Pyrene
OW-5M	05/11/2005	OW-5M-WQ6	N	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
OW-5S	05/11/2005	OW-5S-WQ6	N	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U
OW-5S	05/11/2005	OW-91-WQ6	FD	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U	9.8 U
TW-2D	07/29/2004	TW-2D-037Q	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U
TW-2D	07/29/2004	TW-2D-037Q	N													10 U	
TW-2S	07/29/2004	TW-2S-037Q	N													10 U	
TW-2S	07/29/2004	TW-2S-037Q	N	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.5 U	10 U

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L).

(2) Sample types are as follows:

FD = Field duplicate sample.

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

PAH = polycyclic aromatic hydrocarbon

Table A-1g. Groundwater Data Summary – Site – PCBs

Well	Date	Sample ID	Sample Type	PCB 1016	PCB 1221	PCB 1232	PCB 1242	PCB 1248	PCB 1254	PCB 1260	PCB 1262	PCB 1268
MW-10	07/29/2004	MW10-037	N	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
MW-11	07/29/2004	MW11-037	N	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
MW-12	06/09/2004	MW-12-030	N	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
MW-12	06/09/2004	MW-92-030	FD	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
MW-25	06/09/2004	MW-25-030	N	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
OW-1D	09/30/2004	OW-1D	N	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
TW-2D	07/29/2004	TW-2D-037Q	N	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
TW-2S	07/29/2004	TW-2S-037Q	N	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L).

(2) Sample types are as follows:

N = Primary sample; and

FD = Field duplicate sample.

(3) Data qualifiers are as follows:

U = Not detected; and

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

PCB = polychlorinated biphenyl

Table A-2a. Groundwater Data Summary – Background – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
ADOT New Well	5/18/2005	ADOT New Well-BKG-001	N	64.5	2 U	6.12	81.9	1 U	1 U	9.32	1 U	4.47	8.2	1 U	0.2 U	9.54	1 U	1.07	1 U	1 U	12.1	64.4
ADOT New Well	7/25/2005	ADOT NEW WELL-BKG-002	N	61.2	2 U	5.64	82	1 U	1 U	5.25	1 U	4.47	8.1	1 U	0.2 U	10.2	1 U	1 U	1 U	1 U	12.8	60.1
ADOT New Well	11/3/2005	ADOT New Well-BKG-003	N	134	2 U	5.91	89.8	1 U	1 U	11.5	1 U	18.2	9.1	1 U	0.2 U	10.6	6.65	1 U	1 U	1 U	10.7	33.6 J
ADOT New Well	12/20/2005	ADOT New Well-BKG-004	N	50 U	2 U	5.26	82.4	1 U	1 U	10.5	1 U	1.29	9.4	1 U	0.2 U	9.259999	1 U	1 U	1 U	1 U	10.8	14.1
ADOT New Well	2/23/2006	ADOT New Well-BKG-005	N	50 U	2 U	5.6	92.8	1 U	1 U	6.32	1 U	1 U	4.2	1 U	0.2 U	10.4	1 U	1.01	1 U	1 U	12.2	31.1
ADOT New Well	5/2/2006	ADOT New Well-BKG-006	N	50 U	2 U	4.56	84.3	1 U	1 U	3.51	1 U	1 U	5.4	1 U	0.2 U	9.92	1 U	1 U	1 U	1 U	10.1	27.9
BOR-2	5/11/2005	BOR-2-BKG-001	N	50 U	2 U	16.4	57.8	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	6.3	1 U	1 U	1 U	1 U	1 U	12.3
BOR-2	7/20/2005	BOR-2-BKG-002	N	56.1	2 U	17.8	103	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	5.77	1.16	1 U	1 U	1 U	1 U	10 U
BOR-2	11/1/2005	BOR-2-BKG-003	N	50 U	2 U	19.1	51.8	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	5.79	1.07	1 U	1 U	1 U	1 U	97.1
BOR-2	12/21/2005	BOR-2-BKG-004	N	50 U	2 U	18.6	15.7	1 U	1 U	1 U	1 U	3.25 U	0.2 U	1 U	0.2 U	7.58 U	6.28 U	1 U	1 U	1 U	1.69	10 U
BOR-2	2/21/2006	BOR-2-BKG-005	N	50 U	2 U	14.8	55.6	1 U	1 U	1 U	1 U	1.87 U	0.2 U	1 U	0.2 UJ	6.47	3.82	1 U	1 U	1 U	1.53 U	12.1 U
BOR-2	5/3/2006	BOR-2-BKG-006	N	50 U	2 U	17.5	118	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	5.29	1.28	1 U	1 U	1 U	1 U	10 U
CA Agriculture St	5/16/2005	CA-AG Station-BKG-001	N	50 U	2 U	3.37	27.8	1 U	1 U	2.76	1 U	2.06	2.8	1 U	0.2 U	20.2	1 U	2.72	1 U	1 U	13.1	10 U
CA Agriculture St	7/25/2005	CA Agriculture Station-BKG-002	N	56.2	2 U	3.41	28.4	1 U	1 U	2.81	1 U	2.65	2.2	1 U	0.2 U	20.7	1 U	2.52	1 U	1 U	14.8	35.7
CA Agriculture St	11/3/2005	CA Agriculture Station-BKG-003	N	59.2	2 U	3.22	36.9	1 U	1 U	2.04	1 U	1 U	1 J	1 U	0.2 U	24.8	1 U	3.24	1 U	1 U	15.2	67.8
CA Agriculture St	12/19/2005	CA Agriculture Station-BKG-004	N	50 U	2 U	2.87	31.2	1 U	1 U	2.33	1 U	1 U	2.3	1 U	0.2 U	20.8	1 U	2.88	1 U	1 U	14.5	17.8
CA Agriculture St	2/22/2006	CA Agriculture Station-BKG-005	N	138	2 U	2.59	32.3	1 U	1 U	1 U	1 U	1.28	0.41	1 U	0.2 U	21.1	1 U	3.18	1 U	1 U	12.9	137
CA Agriculture St	5/1/2006	CA AGRICULTURE STATION-BKG-006	N	50 U	2 U	3.57	34.3	1 U	1 U	3.33	1 U	1.72	2.8	1 U	0.2 U	23.4	1 U	2.99	1 U	1 U	15.3	22.7
EPNG-2	5/18/2005	EPNG-2-BKG-001	N	53.5	2 U	5.28	83.6	1 U	1 U	9.69	1 U	5.8	7.4	1 U	0.2 U	8.360001	1 U	1.27	1 U	1 U	13.8	22.7
EPNG-2	7/25/2005	EPNG-2-BKG-002	N	53.9	2 U	5.35	85	1 U	1 U	10.7	1 U	1.77	9.7	1 U	0.2 U	8.740001	1 U	1.13	1 U	1 U	15.3	51.3
EPNG-2	11/3/2005	EPNG-2-BKG-003	N	98.8	2 U	5.59	109	1 U	1 U	12.2	1 U	3.65	8.9	1 U	0.2 U	10.5	1 U	1.33	1 U	1 U	14.5	54.6
EPNG-2	12/20/2005	EPNG-2-BKG-004	N	50 U	2 U	4.23	92.2	1 U	1 U	10.6	1 U	1.25	8.3	1 U	0.2 U	8.55	1 U	1.21	1 U	1 U	13.1	19.7
EPNG-2	2/22/2006	EPNG-2-BKG-005	N	50 U	2 U	4.97	88.2	1 U	1 U	10.3	1 U	1 U	9	1 U	0.2 U	8.58	1 U	1.6	1 U	1 U	13	21.3
EPNG-2	5/2/2006	EPNG-2-BKG-006	N	50 U	2 U	4.59	91	1 U	1 U	10.3	1 U	1 U	8.7	1 U	0.2 U	9.02	1 U	1.12	1 U	1 U	13	10.9
GSRV-2	5/19/2005	GSRV-2-BKG-001	N	50 U	2 U	5.31	53.4	1 U	1 U		1 U	4.74		1 U	0.2 U	5.91	1 U	1.31	1 U	1 U	17.2	14.3
GSRV-2	7/22/2005	GSRV-2-BKG-002	N	50 U	2 U	6.61	60.1	1 U	1 U	27.9	1 U	1.71 J	25.4	1 U	0.2 U	6.74	1 U	1.3	1 U	1 U	18.2	11.8
GSRV-2	11/2/2005	GSRV-2-BKG-003	N	50 U	2.32	6.3	60.7	1.48	1 U	28.6	1 U	1.83 U	24.7	1 U	0.2 U	7.68	1 U	2.82	10.3 J	2.95	19.3 U	14.9 J
GSRV-2	12/22/2005	GSRV-2-BKG-004	N	101 U	2 U	5.06	55.2	1 U	1 U	27.1	1 U	1.29 U	25.3	1 U	0.2 U	7.4	2.08 U	1.52	1 U	1 U	17.6	10 U
GSRV-2	3/21/2006	GSRV-2-BKG-005	N	50 U	2 U	4.82	53	1 U	1 U	26.3	1 U	1 U	26.1	1 U	0.2 U	5.09	1 U	1.47	1 U	1 U	16.3	10 U
GSRV-2	5/4/2006	GSRV-2-BKG-006	N	50 U	2 U	5.59	60.8	1 U	1 U	29.2	1 U	1 U	23.7	1 U	0.2 U	6.54	1 U	1.78	1 U	1 U	19	10 U
GSWC-1	5/17/2005	GSWC-1-BKG-001	N	50 U	2 U	6.04	36.6	1 U	1 U	12	1 U	2.63	13	1 U	0.2 U	7.03	1 U	4.34	1 U	1 U	16.4	10 U
GSWC-1	7/22/2005	GSWC-1-BKG-002	N	50 U	2 U	7.34	40.1	1 U	1 U	12.7	1 U	5.02	12.8	1.29	0.2 U	7.15	1.22	3.96	1 U	1 U	18.4	15.3
GSWC-1	11/2/2005	GSWC-1-BKG-003	N	50 U	2 U	7.56	43.9	1 U	1 U	14.8	1 U	6.65	12.5	2.66	0.2 U	7.58	2.91	5.11	6.68	1 U	24.2	19.9
GSWC-1	12/19/2005	GSWC-1-BKG-004	N	118	2 U	6.76	41.3	1 U	1 U	13.2	1 U	5.05	12.5	1.32	0.2 U	7.27	1.28	4.19	1 U	1 U	19.9	24.8
GSWC-1	2/20/2006	GSWC-1-BKG-005	N	50 U	2 U	7.21	42.4	1 U	1 U	14	1 U	2.29	13	1 U	0.2 U	7.66	1 U	5.16	1 U	1 U	19.5	10.9
GSWC-1	5/1/2006	GSWC-1-BKG-006	N	50 U	2 U	7.08	43	1 U	1 U	13.8	1 U	3.95	12.5	1.18	0.2 U	7.62	1 U	4.42	1 U	1 U	20	10 U
GSWC-2	5/17/2005	GSWC-2-BKG-001	N	50 U	2 U	7.21	46.4	1 U	1 U	5.64	1 U	1 U	5.4	1 U	0.2 U	7.29	1 U	1.61	1 U	1 U	17.3	10 U
GSWC-2	7/22/2005	GSWC-2-BKG-002	N	50 U	2 U	8.52	50.6	1 U	1 U	5.82	1 U	20.2	5.3	1.91	0.2 U	7.17	1.72	1.48	1 U	1 U	18.4	27.6
GSWC-2	11/2/2005	GSWC-2-BKG-003	N	50 U	2 U	7.8	48.8	1 U	1 U	4.84	1 U	1.56	3.6	2.25	0.2 U	7.09	1 U	2.02	1.54	1 U	18.6	30.2
GSWC-2	12/19/2005	GSWC-2-BKG-004	N	50 U	2 U	8.04	51.1	1 U	1 U	6.5	1 U	2.49	5.3	1 U	0.2 U	7.25	1 U	1.69	1 U	1 U	20.2	10 U
GSWC-2	2/20/2006	GSWC-2-BKG-005	N	50 U	2 U	7.93	51.2	1 U	1 U	6.36	1 U	3.15	5.6	1 U	0.2 U	7.39	1 U	2.17	1 U	1 U	19.3	10 U
GSWC-2	6/1/2006	GSWC-2-BKG-006	N	50 U	2 U	8.259999	53.1	1 U	1 U	6.32	1 U	1 U	5	1 U	0.2 U	7.49	1 U	2.01	1 U	1 U	19.6	10 U
GSWC-4	5/18/2005	GSWC-4-BKG-001	N	50 U	2 U	7.42	60.1	1 U	1 U	7.84	1 U	4.85	9.5	1 U	0.2 U	6.93	1 U	1 U	1 U	1 U	20	23.5
GSWC-4	7/22/2005	GSWC-4-BKG-002	N	50 U	2 U	8.620001	42.3	1 U	1 U	11.2	1 U	4.91	10.7	1 U	0.2 U	6.97	1.04	1.06	1 U	1 U	21.4	27.2
GSWC-4	11/2/2005	GSWC-4-BKG-003	N	50 U	2 U	8.46	42.6	1 U	1 U	11.7	1 U	1.78	10.2	1.4	0.2 U	6.72	1 U	1.26	4.06	1 U	26.2	22.8
GSWC-4	12/19/2005	GSWC-4-BKG-004	N	50 U	2 U	7.73	43	1 U	1 U	12	1 U	1.91	10.5	1 U	0.2 U	7.03	2.68	1.25	1 U	1 U	21.5	10 U
GSWC-4	2/23/2006	GSWC-4-BKG-005	N	50 U	2 U	8.070001	47	1 U	1 U	10.4	1 U	1 U	9.2	1 U	0.2 U	7.65	1 U	1.05	1 U	1 U	21.5	10 U
GSWC-4	5/1/2006	GSWC-4-BKG-006	N	50 U	2 U	8.120001	44	1 U	1 U	12.1	1 U	1 U	10.6	1 U	0.2 U	6.97	1 U	1.22	1 U	1 U	21.5	10 U
Langmaack	5/17/2005	Langmaack-BKG-001	N	50 U	2 U	5.26	21.8	1 U	1 U	19.5	1 U	2.25	22.4	1 U	0.2 U	3.56	1 U	1.84	1 U	1 U	15.3	10 U
Langmaack	7/25/2005	LANGMAACK-BKG-002	N	61.6	2 U	6.37	22.7	1 U	1 U	20.4	1 U	2.99	20.9	1 U	0.2 U	3.5	1 U	1.65	1 U	1 U	19.2	16.2
Langmaack	11/2/2005	Langmaack-BKG-003	N	50 U	2 U	6.64	27.7	1 U	1 U	25.9	1 U	7.01	21 J	1 U	0.2 U	3.8	1.35	2.06	3.94	1 U	20.1	24.3
Langmaack	12/19/2005	Langmaack-BKG-004	N	59.4	2 U	5.57	25.6	1 U	1 U	21.8	1 U	18.4	19.4 J	1.04	0.2 U	3.54	20	2	1 U	1 U	18.3	54.1
Langmaack	2/21/2006	Langmaack-BKG-005	N	50 U	2 U	6.38	27.3	1 U	1 U	23.9	1 U	2.92	21.4	1 U	0.2 UJ	3.59	1 U	1.9	1 U	1 U	18.6	15.6

Table A-2a. Groundwater Data Summary – Background – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Langmaack	5/1/2006	LANGMAACK-BKG-006	N	50 U	2 U	6.19	26.1	1 U	1 U	21.4	1 U	2.48	18.8	1 U	0.2 U	3.51	1 U	1.6	1 U	1 U	18.1	10 U
Lily Hill	5/16/2005	Lily Hill-BKG-001	N	50 U	2 U	14.6	52.6	1 U	1 U	9.52	1 U	3.56	10.9	1 U	0.2 U	12.6	1 U	2.07	1 U	1 U	21.6	10 U
Lily Hill	7/25/2005	LILY HILL-BKG-002	N	63.1	2 U	15.9	59.6	1 U	1 U	10.6	1 U	1.8	10.3	1 U	0.2 U	13.2	1 U	2.61	1 U	1.16	24.2	24.2
Lily Hill	11/3/2005	Lily Hill-BKG-003	N	76.8	2 U	18.9	72.5	1 U	1 U	12.6	1 U	3.88	10.2	1.61	0.2 U	14.6	1 U	2.9	1 U	1 U	28.2	37.1
Lily Hill	12/20/2005	Lily Hill-BKG-004	N	50 U	2 U	6.04	41.4	1 U	1 U	2.83	1 U	6.49	2.6	1 U	0.2 U	17	1 U	4.31	1 U	1 U	10.5	10 U
Lily Hill	2/22/2006	Lily Hill-BKG-005	N	50 U	2 U	16.6	60.2	1 U	1 U	8.34	1 U	2.14	7.6	1 U	0.2 U	13.2	4.98	2.1	1 U	1 U	25.3	22.6
Lily Hill	5/1/2006	Lily Hill-BKG-006	N	50 U	2 U	7.69	68.6	1 U	1 U	3.06	1 U	20.5	2.6	4.04	0.2 U	17.2	2.33	3.97	1 U	1 U	13.1	32.7
MW-16	5/13/2005	MW-16-BKG-001	N	50 U	2 U	8.71	26.1	1 U	1 U	10.8	1 U	1 U	10.7	1 U	0.2 U	13.7	7.09	1.81	1 U	1 U	28.4	10 U
MW-16	7/26/2005	MW-16-BKG-002	N	58.1	2 U	9.74	29.4	1 U	1 U	10.2	1 U	4.13	8.8	1 U	0.2 U	12.6	8.84	1.61	1 U	1 U	32	14
MW-16	11/3/2005	MW-16-BKG-003	N	50 U	2 U	10.3	32.3	1 U	1 U	12.6	1 U	2.19	7.7	1 U	0.2 U	12.8	12.4 J	1.72	1 U	1 U	35.8	12.1
MW-16	12/22/2005	MW-16-BKG-004	N	92.3 U	2 U	8.79	28.7	1 U	1 U	9.58	1 U	4.08 J	8.2	1 U	0.2 U	13.5	9.79 J	1.54	1 U	1 U	31.8	16.9
MW-16	3/1/2006	MW-16-BKG-005	N	50 U	2 U	9.51	29.3	1 U	1 U	11	1 U	1 U	8.9	1 U	0.2 U	12.7	8.04	1.82	1 U	1 U	31.6	20.5
MW-16	5/3/2006	MW-16-BKG-006	N	50 U	2 U	9.87	30.2	1 U	1 U	9.72	1 U	1 U	8.2	1 U	0.2 U	10.9	8.530001	1.49	1 U	1 U	34.7	10 U
MW-17	5/19/2005	MW-17-BKG-001	N	50 U	2 U	1.73	34.2	1 U	1 U	13.2	1 U	19.8 J	14.1	1 U	0.2 U	17.4	1 U	12.2	1 U	1 U	4.48	63.4
MW-17	7/26/2005	MW-17-BKG-002	N	50 U	2 U	1.53	35.2	1 U	1 U	12	1 U	3.15	12.5	1 U	0.2 U	18.7	1.5	13.1	1 U	1 U	3.93	88.8
MW-17	11/2/2005	MW-17-BKG-003	N	50 U	2 U	2.22	37.7	1 U	1 U	23.3 J	1 U	7.21 J	13.6		0.2 U	19	1.47	13.6	1.08	1 U	7.19 J	74.7 J
MW-17	12/22/2005	MW-17-BKG-004	N	50 U	2 U	1 U	33.2	1 U	1 U	6.59 J	1 U	10.9 J	12.9	1 U	0.2 U	20.7	9.24 J	13.1	1 U	1 U	3.77	70.3 J
MW-17	3/1/2006	MW-17-BKG-005	N	50 U	2 U	1.64	35.9	1 U	1 U	11.6	1 U	1.3	14.8	1 U	0.2 U	19.7	1.91	12.7	1 U	1 U	3.5	82.8
MW-17	5/9/2006	MW-17-BKG-006	N	50 U	2 U	1.36	37.5	1 U	1 U	15.8 J	1 U	1 U	14.6	1 U	0.2 U	14.6	2.23 J	12.8	1 U	1 U	4.08	56
MW-18	5/11/2005	MW-18-WQ6	N	84.8	2 U	1 U	83.1	1 U	1 U	27.8	1 U	1 U	26.5	1 U	0.5 U	3.6	1 U	2.58	1 U	1 U	3.37	40.4 J
MW-18	7/26/2005	MW-18-BKG-002	N	50 U	2 U	1.07	82.8	1 U	1 U	26.3	1 U	3.27	23.6	1 U	0.2 U	4.42	1 U	2.67	1 U	1 U	3.87	22.2
MW-18	11/3/2005	MW-18-BKG-003	N	50 U	2 U	1.43	75.2	1 U	1 U	40.4	1 U	3.75	35	1 U	0.2 U	6.33	1 U	3.35	1 U	1 U	7.55	31.9
MW-18	2/9/2006	MW-18-BKG-004	N	50 U	2 U	1.2	58.9	1 U	1 U	36.1	1 U	1 U	31.8	1 U	0.2 U	4.88	1.57	3	1 U	1 U	5.25	10 U
MW-18	3/1/2006	MW-18-BKG-005	N	50 U	2 U	1 U	58.9	1 U	1 U	36.3	1 U	1.02	36.2	1 U	0.2 U	4.63	2.02	3.21	1 U	1 U	4.24	11
MW-18	5/1/2006	MW-18-BKG-006	N	50 U	2 U	1.08	62.5	1 U	1 U	37.4	1 U	1 U	37.6	1 U	0.2 U	4.71	1 U	3.13	1 U	1 U	4.29	10 U
Needles MW-10	5/16/2005	MW-10-BKG-001	N	50 U	2 U	2.99	16.8	1 U	1 U	1 U	1 U	1.55	0.2 U	1 U	0.2 U	9.809999	1 U	1 U	1 U	1 U	4.73	10 U
Needles MW-10	7/21/2005	Needles MW-10-BKG-002	N	50.9	2 U	3.84	20.7	1 U	1 U	1.09	1 U	3.22	0.2 U	1 U	0.2 U	10.7	1 U	1 U	1 U	1 U	5.83	24.8
Needles MW-10	11/3/2005	Needles MW-10-BKG-003	N	102	2 U	3.91	23.2	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	10.8	1 U	1.44	1 U	1 U	5.45	50.1
Needles MW-10	12/20/2005	Needles MW-10-BKG-004	N	50 U	2 U	3.53	20.3	1 U	1 U	1 U	1 U	1.32	0.2 U	1 U	0.2 U	9.74	1.19	1.01	1 U	1 U	4.98	10 U
Needles MW-10	2/22/2006	Needles MW-10-BKG-005	N	50 U	2 U	4.24	22.4	1 U	1 U	1 U	1 U	1.1	0.2 U	1 U	0.2 U	10.8	1 U	1.27	1 U	1 U	5.57	10 U
Needles MW-10	5/2/2006	Needles MW-10-BKG-006	N	50 U	2 U	3.56	20.6	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	9.91	1 U	1.23	1 U	1 U	4.9	10 U
Needles MW-11	5/16/2005	MW-11-BKG-001	N	50 U	2 U	5.64	23.2	1 U	1 U	2.26	1 U	4.31	2.3	1 U	0.2 U	15.7	1 U	3.08	1 U	1 U	9.18	10 U
Needles MW-11	7/21/2005	Needles MW-11-BKG-002	N	50 U	2 U	6.56	28.6	1 U	1 U	2.89	1 U	4.19	2.3	1.43	0.2 U	17.7	1.02	3.84	1 U	1 U	10.8	46.5
Needles MW-11	11/3/2005	Needles MW-11-BKG-003	N	164	2 U	7.25	32.3	1 U	1 U	3.31	1 U	3.69	2.4	1 U	0.2 U	18.9	1 U	4.75	1 U	1 U	12.3	24.8
Needles MW-11	12/20/2005	Needles MW-11-BKG-004	N	50 U	2 U	5.94	26.5	1 U	1 U	2.5	1 U	1.85	2.3	1 U	0.2 U	16	1 U	3.55	1 U	1 U	10.3	10 U
Needles MW-11	2/22/2006	Needles MW-11-BKG-005	N	50 U	2 U	6.01	27.8	1 U	1 U	3.05	1 U	2.02	2.6	1 U	0.2 U	16.1	1 U	4.96	1 U	1 U	11	10 U
Needles MW-11	5/2/2006	Needles MW-11-BKG-006	N	50 U	2 U	6.08	27.4	1 U	1 U	2.65	1 U	5.11	2.4	1 U	0.2 U	17.4	1 U	3.93	1 U	1 U	10.6	17.9
Needles MW-12	6/22/2005	Needles MW-12-BKG-001	N	50 U	2 U	3.53	28.8	1 U	1 U	1 U	1 U	3.66	0.2 U	1 U	0.2 U	10.5	3.31	1 U	1 U	1.22	6.95	26.4
Needles MW-12	7/21/2005	Needles MW-12-BKG-002	N	50 U	2 U	3.49	30.8	1 U	1 U	1 U	1 U	3.5	0.2 U	1 U	0.2 U	10.4	2.77	1 U	1 U	1 U	5.31	10 U
Needles MW-12	11/3/2005	Needles MW-12-BKG-003	N	50 U	2 U	4.24	36.3	1 U	1 U	1 U	1.35	9.51	1 UJ	1.83	0.2 U	12	8.1	1 U	1 U	1 U	5.69	37.6
Needles MW-12	12/20/2005	Needles MW-12-BKG-004	N	50 U	2 U	3.03	33.7	1 U	1 U	1 U	1 U	3.87	0.2 U	1 U	0.2 U	11.2	3.85	1 U	1 U	1 U	4.82	11.8
Needles MW-12	2/22/2006	Needles MW-12-BKG-005	N	50 U	2 U	3.57	31	1 U	1 U	1 U	1 U	4.08	0.2 U	1 U	0.2 U	11	3.98	1 U	1 U	1 U	5.59	18
Needles MW-12	5/2/2006	Needles MW-12-BKG-006	N	50 U	2 U	3.66	32	1 U	1 U	1 U	1.01	4.19	0.2 U	4.09	0.2 U	12.1	41.5	1 U	1 U	1 U	5.39	18.7
New Farm Well	5/12/2005	New Farm Well-BKG-001	N	50 U	2 U	5.02	60.1	1 U	1 U	1 U	1 U	1.5	0.2 U	1 U	0.2 U	5.71	1 U	1 U	1 U	1 U	1 U	10 U
New Farm Well	7/20/2005	New Farm Well-BKG-002	N	53.7	2 U	6.41	66.4	1 U	1 U	1 U	1 U	1.24	0.2 U	1 U	0.2 U	6.59	1 U	1 U	1 U	1 U	1 U	34.4
New Farm Well	11/1/2005	New Farm Well-BKG-003	N	50 U	2 U	5.38	75	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	5.87	1 U	1 U	1 U	1 U	1 U	10 U
New Farm Well	12/21/2005	New Farm Well-BKG-004	N	50 U	2 U	4.65	75.5	1 U	1 U	1 U	1 U	3.03	0.2 U	1 U	0.2 U	5.8	1.32	1 U	1 U	1 U	1 U	20.6
New Farm Well	2/21/2006	New Farm Well-BKG-005	N	50 U	2 U	5.37	72	1 U	1 U	1 U	1 U	2.55	0.2 U	1 U	0.2 UJ	6.38	1 U	1 U	1 U	1 U	1 U	10.6
New Farm Well	5/3/2006	New Farm Well-BKG-006	N	50 U	2 U	5.48	64.9	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	6.27	1 U	1 U	1 U	1 U	1 U	10 U
P-2	5/13/2005	P-2-BKG-001	N	50 U	2 U	2.26	147	1 U	1 U	2.91	1 U	1 U	2.7	1 U	0.2 U	5.78	1.42 U	1.63	1 U	1 U	11.4	16.2 U
P-2	7/26/2005	P-2-BKG-002	N	50 U	2 U	2.09	141	1 U	1 U	3.8	1 U	3.36	3.2	1 U	0.2 U	5.78	1 U	1.98	1 U	1 U	12.7	10 U
P-2	11/30/2005	P-2-BKG-003	N	50 U	2 U	2.07	149	1 U	1 U	3.4	1 U	4.18	3.1	1 U	0.2 U	5.95	1.26	1.71	1 U	1 U	11.4	37.4
P-2	12/21/2005	P-2-BKG-004	N	50 U	2 U	2.21	148	1 U	1 U	3.31	1 U	2.69	3	1 U	0.2 U	5.51	1.27	1.84	1 U	1 U	12.2	42.4

Table A-2a. Groundwater Data Summary – Background – Metals

Well	Date	Sample ID	Sample Type	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, total	Cobalt	Copper	Chromium, hexavalent	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
P-2	3/21/2006	P-2-BKG-005	N	50 U	2 U	2.04	145	1 U	1 U	3.58	1 U	1.41	2.9	1 U	0.2 U	4.62	1 U	1.7	1 U	1 U	11.3	35.9
P-2	5/4/2006	P-2-BKG-006	N	50 U	2 U	2.3	163	1 U	1 U	3.23	1 U	1 U	2.6	1.02	0.2 U	5.81	1 U	1.79	1 U	1 U	12.4	10 U
Park Moabi-3	5/18/2005	PMM-Supply-BKG-001	N	50 U	2 U	1.58	143	1 U	1 U	11.5	1 U	4.64	10.2	1 U	0.2 U	5.31	2.71 J	1.36	1 U	1 U	9.65	37.5
Park Moabi-3	7/21/2005	PMM-Supply-BKG-002	N	60	2 U	2.06	155	1 U	1 U	10.2	1 U	2.41	9.7	1 U	0.2 U	5.41	1 U	1.51	1 U	1 U	9.31	14.5
Park Moabi-3	11/2/2005	PMM-Supply-BKG-003	N	50 U	2 U	1.52	188	1 U	1 U	5.47	1 U	1.98	0.5	1.62	0.2 U	4.77	1 U	1.6	1.25	1 U	10	51.6
Park Moabi-3	12/19/2005	PMM-Supply-BKG-004	N	50 U	2 U	1.63	149	1 U	1 U	9.89	1 U	1 U	7.9	1 U	0.2 U	5.36	1 U	1.68	1 U	1 U	9.55	22.2
Park Moabi-3	2/22/2006	PMM-Supply-BKG-005	N	50 U	2 U	1.69	148	1 U	1 U	9.46	1 U	1.02	8.4	1 U	0.2 U	5.76	1 U	2.09	1 U	1 U	8.54	29
Park Moabi-3	5/1/2006	PMM-SUPPLY-BKG-006	N	50 U	2 U	1.56	153	1 U	1 U	10.6	1 U	1 U	9.5	1 U	0.2 U	5.63	1 U	1.58	1 U	1 U	9.1	17.4
PGE-9S	5/11/2005	PGE-9S-BKG-001	N	50 U	2 U		94	1 U	1 U	1 U	1 U	1.2	1 U	1 U	0.2 U	15.3	1.79	1 U	1 U	1 U	1 U	
PGE-9S	7/20/2005	PGE-9S-BKG-002	N	50 U	2 U		180	1 U	1 U	1 U	1 U	2.49	1 U	1 U	0.2 U	19.2	1 U	1 U	1 U	1 U	1 U	
PGE-9S	10/31/2005	PGE-9S-BKG-003	N	50 U	2 U		118	1 U	1 U	1 U	1.64	1 U	1 U	1 U	0.2 U	16.3	1.34	1 U	1 U	1 U	1.46	
PGE-9S	12/20/2005	PGE-09S-BKG-004	N	50 U	2 U		107	1 U	1 U	1 U	1 U	7.38 J	1 U	1 U	0.2 U	18.9	1.59	1 U	1 U	1 U	1 U	
PGE-9S	2/21/2006	PGE-09S-BKG-005	N	50 U	2 U		110	1 U	1 U	1 U	1 U	14.4 J	1 U	3.55 J	0.2 UJ	17.1	1.02	1 U	1 U	1 U	1 U	
PGE-9S	5/3/2006	PGE-09S-BKG-006	N	50 U	2 U		114	1 U	1 U	1 U	1.42	1 U	1 U	1 U	0.2 U	19.7	2.07	1 U	1 U	1 U	1.02	
Sanders	5/18/2005	Sanders-BKG-001	N	73.8	2 U		63.8	1 U	1 U	1.04	1 U	5.96	0.24	1 U	0.2 U	31.1	1.37	3.87	1 U	1.14	42.8	112
Sanders	7/25/2005	SANDERS-BKG-002	N	50 U	2 U		53.7	1 U	1 U	1.13	1 U	3.94	0.57	1 U	0.2 U	37.3	1	3.92	1 U	1 U	47.6	60.5
Sanders	11/3/2005	Sanders-BKG-003	N	50 U	2 U		50.3	1 U	1 U	1 U	1 U	1.93	1 U	1 U	0.2 U	38.8	1 U	3.36	1 U	1 U	63.8	123
Sanders	12/20/2005	Sanders-BKG-004	N	50 U	2 U		44.7	1 U	1 U	1 U	1 U	1.93	0.39	1 U	0.2 U	37	1 U	2.95	1 U	1 U	59.8	28.2
Sanders	3/1/2006	Sanders-BKG-005	N	50 U	2 U		40.8	1 U	1 U	1 U	1 U	3.91	0.22	1 U	0.2 U	31.8	3.46	2.8	1 U	1 U	65.2	103
Sanders	5/2/2006	Sanders-BKG-006	N	50 U	2 U		39.1	1 U	1 U	1 U	1 U	3.22	0.66	1 U	0.2 U	41.7	1 U	3.02	1 U	1 U	80.3	39.3
Tayloe	5/16/2005	Tayloe-BKG-001	N	50 U	2 U	4.38	49.9	1 U	1 U	1.13	1 U	1 U	1	2.52	0.2 U	10.1	1 U	1.88	1 U	1 U	7.62	35.3
Tayloe	7/25/2005	TAYLOE-BKG-002	N	50 U	2 U	6.18	44.9	1 U	1 U	1 U	1 U	2.89	0.49	1.14	0.2 U	10.9	1 U	2.36	1 U	1 U	9.61	66.3
Tayloe	11/3/2005	Tayloe-BKG-003	N	53.1	2 U	5.09	48	1 U	1 U	1 U	1 U	1.12	0.2 U	2.4	0.2 U	10.2	1 U	1.87	1 U	1 U	7.3	89.8
Tayloe	12/20/2005	Tayloe-BKG-004	N	66.5 U	2 U	5.53	47.7	1 U	1 U	1 U	1 U	6.99	0.35	1.59	0.2 U	12.2	1.32	1.87	1 U	1 U	7.09	85.60001
Tayloe	2/22/2006	Tayloe-BKG-005	N	50 U	2 U	5.4	48.4	1 U	1 U	1 U	1 U	1.61	0.46	1.47	0.2 U	10.3	1 U	2.4	1 U	1 U	7.87	68.89999
Tayloe	5/2/2006	Tayloe-BKG-006	N	50 U	2 U	4.8	54.5	1 U	1 U	1.56	1 U	3.13	1.1	2.33	0.2 U	11.2	1 U	2.33	1 U	1 U	8.42	74.8
TMLP-2	5/12/2005	TMLP-2-BKG-001	N	50 U	2 U	5.34	22.3	1 U	1 U	19.3	1 U	1 U	10.9	1 U	0.2 U	5.16	1 U	1	1 U	1 U	17	10 U
TMLP-2	7/20/2005	TMLP-2-BKG-002	N	50 U	2 U	6.64	20.2	1 U	1 U	22.5	1 U	3.05	18.1	1 U	0.2 U	6.11	1 U	1 U	1 U	1 U	21.4	18
TMLP-2	11/1/2005	TMLP-2-BKG-003	N	68.7	2 U	5.56	14.9	1 U	1 U	19.8	1 U	1 U	19.1	1 U	0.2 U	5.11	1.06	1 U	1 U	1 U	19.3	41.2
TMLP-2	12/19/2005	TMLP-2-BKG-004	N	50 U	2 U	5.92	14.2	1 U	1 U	21.6	1 U	1 U	19.1	1 U	0.2 U	5.37	1 U	1 U	1 U	1 U	20.6	10 U
TMLP-2	2/23/2006	TMLP-2-BKG-005	N	50 U	2 U	6	12.4	1 U	1 U	23.3	1 U	1 U	14.5	1 U	0.2 U	5.83	1 U	1.3	1 U	1 U	20.8	10 U
TMLP-2	5/1/2006	TMLP-2-BKG-006	N	50 U	2 U	6	11.5	1 U	1 U	22.8	1 U	1 U	20.4	1 U	0.2 U	5.53	1 U	1 U	1 U	1 U	18.9	10 U
Topock-2	6/22/2005	Topock-2-BKG-001	N	50 U	2 U		80	1 U	1 U	10.8	1 U	3.6	6.3	1 U	0.2 U	23.9	1 U	1 U	1 U	1 U	19.1	19.1
Topock-2	7/21/2005	TOPOCK-2-BKG-002	N	50 U	2 U		69	1 U	1 U	11	1 U	4.9	7.4	1 U	0.2 U	25	1 U	1 U	1 U	1 U	17.9	10 U
Topock-2	11/2/2005	Topock-2-BKG-003	N	140	2 U		72.6	1 U	1 U	16.9 J	1 U	3.53	7.4		0.2 U	22.1	1.13	1.19	3.25	1 U	21.7	44.4 J
Topock-2	12/19/2005	Topock-2-BKG-004	N	50 U	2 U		71.5	1 U	1 U	10.8	1 U	1.75 J	6.7 J	1 U	0.2 U	19.7	2.17 J	1 U	1 U	1 U	18.9	12.4
Topock-2	2/23/2006	Topock-2-BKG-005	N	50 U	2 U		104	1 U	1 U	14.1	1 U	1.01	11.8	1 U	0.2 U	21.5	1 U	1 U	1 U	1 U	20.5	10 U
USFW-5	5/12/2005	USFW-5-BKG-001	N	50 U	2 U	3.42	37	1 U	1 U	1 U	1 U	1.96	0.2 U	1 U	0.2 U	4.38	1 U	1 U	1 U	1 U	1 U	10 U
USFW-5	7/20/2005	USFW-5-BKG-002	N	53.8	2 U	3.83	43.8	1 U	1 U	1 U	1 U	3.3	0.2 U	1 U	0.2 U	5.28	1 U	1 U	1 U	1 U	1 U	12.2
USFW-5	11/1/2005	USFW-5-BKG-003	N	50 U	2 U	3.91	49.2	1 U	1 U	1.55	1 U	1.37	0.2 U	1 U	0.2 U	5.55	1 U	1 U	1 U	1 U	1 U	109
USFW-5	12/21/2005	USFW-5-BKG-004	N	50 U	2 U	3.64	45.9	1 U	1 U	1 U	1 U	3.2	0.2 U	1 U	0.2 U	4.85	2.89	1 U	1 U	1 U	1 U	10 U
USFW-5	2/21/2006	USFW-5-BKG-005	N	50 U	2 U	4.12	46	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 UJ	5.2	1 U	1 U	1 U	1 U	1 U	10 U
USFW-5	5/3/2006	USFW-5-BKG-006	N	50 U	2 U	4.19	46.3	1 U	1 U	1 U	1 U	1 U	0.2 U	1 U	0.2 U	4.98	1 U	1 U	1 U	1 U	1 U	10 U

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L).

(2) Sample types are as follows:

N = Primary sample

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

Table A-2b. Groundwater Data Summary – Background – Other Chemicals

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Tritium pCi/L
ADOT New Well	05/18/2005	ADOT New Well-BKG-001	N	92.7	0.5 U	39200	208	4.2	100 U	5900	2.45	1.81	2 U	5580	177000		70.6	2 U	350 U
ADOT New Well	07/25/2005	ADOT NEW WELL-BKG-00	N	87.6	0.5 U	39400	209	3.79	100 U	5890	4.12	1.99 J	2 U	5810	185000		67.4	2 U	-241 U
ADOT New Well	11/03/2005	ADOT New Well-BKG-003	N	5 U	0.5 U	40800	204	3.87	100 U	5990	1 U	1.86		5640	181000		65.9		
ADOT New Well	12/20/2005	ADOT New Well-BKG-004	N	80.3	0.5 U	37500	203	3.85	100 U	5520	1 U	1.9		5170	170000		66.4		
ADOT New Well	02/23/2006	ADOT New Well-BKG-005	N	79.9	0.5 U	40900	209	4.34	100 U	6320	2.02	1.97		5680	188000		69.3		
ADOT New Well	05/02/2006	ADOT New Well-BKG-006	N	88.4	0.5 U	36200	219	4.21	100 U	5740	2.53	1.9		5140	166000		69.9		
BOR-2	05/11/2005	BOR-2-BKG-001	N	173	0.5 U	78100	79.1	0.5 U	1070	34400	259	0.1 U	2 U	5180	109000		208	2 U	350 U
BOR-2	07/20/2005	BOR-2-BKG-002	N	200	0.5 U	76700	70.7	0.5 UJ	1360	30700	294	0.5 U	2 U	5220	99300		189	2 U	10.3 U
BOR-2	11/01/2005	BOR-2-BKG-003	N	218	0.667	89000	139	0.55	2150	72300	309	0.5 U		5990	232000		369		
BOR-2	12/21/2005	BOR-2-BKG-004	N	277	0.997	82800	466	0.687	3150	215000	202	0.5 UJ		6540	727000	2260	1270		
BOR-2	02/21/2006	BOR-2-BKG-005	N	201	0.638	74600	72.2	0.5 U	673 U	37400	174	0.5 U		4810	117000		190		
BOR-2	05/03/2006	BOR-2-BKG-006	N	185	0.5 U	79500	77.7	0.5 U	1340	29300	286	0.5 U		5200	97000		204		
CA Agriculture Station	05/16/2005	CA-AG Station-BKG-001	N	92.3	0.5 U	56400	259	1.3	100 U	15400	1.63	1.76	2 U	5150	216000		220	2 U	350 U
CA Agriculture Station	07/25/2005	CA Agriculture Station-BKG-	N	87.6	0.5 U	59300	261	1.26	100 U	15900	2.46	1.86 J	2 U	5390	235000		215	2 U	-155 U
CA Agriculture Station	11/03/2005	CA Agriculture Station-BKG-	N	5 U	0.5 U	71900	250	1.43	100 U	19100	5.22	1.68		6240	274000		205		
CA Agriculture Station	12/19/2005	CA Agriculture Station-BKG-	N	82.7	0.5 U	60700	254	1.54	100 U	16400	3.47	1.87		5310	239000		205		
CA Agriculture Station	02/22/2006	CA Agriculture Station-BKG-	N	90.1	0.5 U	64700	260	1.58	100 U	16500	4.78	1.86		5290	255000		212		
CA Agriculture Station	05/01/2006	CA AGRICULTURE STATIC	N	90.6	0.5 U	60900	265	1.27	100 U	17600	1.24	1.8		5520	235000		219		
EPNG-2	05/18/2005	EPNG-2-BKG-001	N	92.7	0.5 U	35900	195	3.68	100 U	7100	1.49	1.84	2 U	5360	162000		69.7	2 U	350 U
EPNG-2	07/25/2005	EPNG-2-BKG-002	N	95.1	0.5 U	37300	195	3.3	100 U	7330	1 U	2.01 J	2 U	5660	174000		61.9	2 U	6.2 U
EPNG-2	11/03/2005	EPNG-2-BKG-003	N	5 U	0.5 U	45800	188	3.4	100 U	8680	1 U	1.9		6410	200000		62.2		
EPNG-2	12/20/2005	EPNG-2-BKG-004	N	90	0.5 U	37900	193	3.5	100 U	7420	1 U	1.98		5350	168000		64		
EPNG-2	02/22/2006	EPNG-2-BKG-005	N	87.7	0.5 U	38500	199	3.71	100 U	6880	1 U	1.96		5260	177000		67.8		
EPNG-2	05/02/2006	EPNG-2-BKG-006	N	93.7	0.5 U	35200	205	3.79	100 U	7390	1 U	1.93		5130	163000		67.8		
GSRV-2	05/19/2005	GSRV-2-BKG-001	N	156	0.5 U	42900	51.7	2.22	100 U	14900	1 U	3.1	2 UJ	5130	61400		40.6	2 U	350 U
GSRV-2	07/22/2005	GSRV-2-BKG-002	N	157	0.5 U	45400	49	1.9	100 U	14800	1 U	3.18	2 U	5720	63600		37.5	2 U	-39.2 U
GSRV-2	11/02/2005	GSRV-2-BKG-003	N	153	0.5 U	46500	49.7	1.93	100 U	16100	11.8 J	3.07		5470	67600		37.2		
GSRV-2	12/22/2005	GSRV-2-BKG-004	N	153	0.5 U	43400	51.1	2.19	104	15300	2.78 J	3.15		5300	63200	373	38.2		
GSRV-2	03/21/2006	GSRV-2-BKG-005	N	174	0.5 U	40400	50.7	1.96	100 U	14900	1 U	3.12		4400	59500		37.9		
GSRV-2	05/04/2006	GSRV-2-BKG-006	N	161	0.5 U	45600	53.1	1.61	100 U	15400	1 U	2.57		5340	65500		41.2		
GSWC-1	05/17/2005	GSWC-1-BKG-001	N	123	0.5 U	37700	79	0.5 U	100 U	15900	1 U	3.9	2 U	5970	82700		80.3	2 U	350 U
GSWC-1	07/22/2005	GSWC-1-BKG-002	N	132	0.5 U	39900	77.8	0.845	100 U	16400	1 U	4.32	2 U	6680	88200		89	2 U	-49.5 U
GSWC-1	11/02/2005	GSWC-1-BKG-003	N	132	0.5 U	42800	76.7	0.894	100 U	18100	1 U	4.44		6880	94800		90.3		
GSWC-1	12/19/2005	GSWC-1-BKG-004	N	109	0.5 U	40400	76.1	1.07	100 U	17000	1 U	4.49		6390	91400		87.5		
GSWC-1	02/20/2006	GSWC-1-BKG-005	N	124	0.5 U	43000	77.2	1.36	100 U	17300	1 U	4.67		6340	96100		89.3		
GSWC-1	05/01/2006	GSWC-1-BKG-006	N	126	0.5 U	39700	81	0.784	100 U	17400	1 U	4.6		6430	89600		93.7		
GSWC-2	05/17/2005	GSWC-2-BKG-001	N	128	0.5 U	29100	99.1	0.5 U	100 U	11700	1.38	1.31	2 U	5170	95900		56.4	2 U	350 U
GSWC-2	07/22/2005	GSWC-2-BKG-002	N	134	0.5 U	30300	98.4	0.855	100 U	11500	1 U	1.49 J	2 U	5640	100000		59.4	2 U	-175 U
GSWC-2	11/02/2005	GSWC-2-BKG-003	N	127	0.5 U	31900	97.3	0.914	100 U	12500	2.02	1.53		5420	105000		59.2		
GSWC-2	12/19/2005	GSWC-2-BKG-004	N	124	0.5 U	31700	95.9	1.09	100 U	12400	1 U	1.61		5430	106000		56.9		
GSWC-2	02/20/2006	GSWC-2-BKG-005	N	122	0.5 U	32300	99.1	0.847	100 U	11900	1 U	1.62		5100	107000		58.6		
GSWC-2	06/01/2006	GSWC-2-BKG-006	N	127	0.5 U	30600	105	0.877	100 U	12300	2.02	1.74		5420	102000		62.8		
GSWC-4	05/18/2005	GSWC-4-BKG-001	N	160	0.5 U	25300	54.4	0.754	203	8910	1.84	1.44	2 U	4710	84000		36.3	2 U	350 U
GSWC-4	07/22/2005	GSWC-4-BKG-002	N	152	0.5 U	25900	46.7	0.855	100 U	8610	1 U	1.9 J	2 U	5060	80700		33.9	2 U	-18.5 U
GSWC-4	11/02/2005	GSWC-4-BKG-003	N	156	0.5 U	25400	46.5	0.949	100 U	9030	1 U	1.83		4600	82100		33.4		
GSWC-4	12/19/2005	GSWC-4-BKG-004	N	146	0.5 U	26400	46.7	1.07	100 U	9210	1 U	1.87		4690	84500		33		
GSWC-4	02/23/2006	GSWC-4-BKG-005	N	150	0.5 U	27000	49.7	0.858	100 U	9780	1 U	1.83		4910	90100		35.2		
GSWC-4	05/01/2006	GSWC-4-BKG-006	N	170	0.5 U	25400	49.4	0.811	100 U	8860	1 U	1.92		4690	81800		35.5		

Table A-2b. Groundwater Data Summary – Background – Other Chemicals

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Tritium pCi/L
Langmaack	05/17/2005	Langmaack-BKG-001	N	138	0.5 U	26300	47.3	0.5 U	100 U	11300	1.1	3.04	2 U	4710	58400		36.1	2 U	350 U
Langmaack	07/25/2005	LANGMAACK-BKG-002	N	138	0.5 U	29700	45.8	0.785	100 U	12500	4.05	3.24 J	2 U	5480	67600		36.2	2 U	18.5 U
Langmaack	11/02/2005	Langmaack-BKG-003	N	140	0.5 U	32100	45.5	0.871	100 U	13700	1.36	3.11		5810	70700		35.5		
Langmaack	12/19/2005	Langmaack-BKG-004	N	156	0.5 U	29800	46.3	1	100 U	12800	2.49	3.14		5850	66800		35.3		
Langmaack	02/21/2006	Langmaack-BKG-005	N	142	0.5 U	33100	47.2	0.909	100 U	13200	1.9	3.29		5370	74300		36.4		
Langmaack	05/01/2006	LANGMAACK-BKG-006	N	140	0.5 U	28900	49.8	0.752	100 U	12800	1.1	3.14		5320	64500		38.4		
Lily Hill	05/16/2005	Lily Hill-BKG-001	N	144	0.5 U	20600	50.7	1.71	100 U	7220	1 U	4.22	2 U	4210	89100		54.5	2 U	350 U
Lily Hill	07/25/2005	LILY HILL-BKG-002	N	138	0.5 U	23500	50.4	1.63	100 U	7930	1 U	4.7 J	2 U	4620	101000		61.5	2 U	-96.9 U
Lily Hill	11/03/2005	Lily Hill-BKG-003	N	5 U	0.5 U	27500	50.4	1.69	100 U	9290	1 U	4.75		5130	113000		61.8		
Lily Hill	12/20/2005	Lily Hill-BKG-004	N	204	0.5 U	109000	310	1.9	100 U	45800	1.72	1.89		13100	331000		438		
Lily Hill	02/22/2006	Lily Hill-BKG-005	N	127	0.5 U	23800	46.3	1.82	100 U	7610	34	4.03		4320	106000		48.7		
Lily Hill	05/01/2006	Lily Hill-BKG-006	N	217	0.5 U	93800	299	1.52	100 U	43900	7.94	1.85		12000	293000		418		
MW-16	05/13/2005	MW-16-BKG-001	N	99.1	0.5 U	30600	169	2.8	100 U	5840	1 U	3.27	2 U	4110	212000		159	2 U	350 U
MW-16	07/26/2005	MW-16-BKG-002	N	98	0.5 U	29900	202	2.35	100 U	5590	2.91	3.07	2 U	4250	209000		136	2 U	-16.5 U
MW-16	11/03/2005	MW-16-BKG-003	N	5 U	0.5 U	32300	178	2.29	100 U	5940	2.17	2.77		4340	224000		114		
MW-16	12/22/2005	MW-16-BKG-004	N	102	0.5 U	29800	182	2.38	100 U	5720	1.24	2.69		4040	213000	595	119		
MW-16	03/01/2006	MW-16-BKG-005	N	96.9	0.5 U	30900	177	2.43	100 U	5910	1.9	2.76		4090	222000		135		
MW-16	05/03/2006	MW-16-BKG-006	N	107	0.5 U	28400	193	2.2	100 U	4850	1 U	2.72		4040	205000		114		
MW-17	05/19/2005	MW-17-BKG-001	N	51.3	0.5 U	119000	104	1.84	100 U	17900	5.2	3.76	2 UJ	10200	272000		702	2 U	350 U
MW-17	07/26/2005	MW-17-BKG-002	N	53.9	0.5 U	126000	106	1.7	100 U	18500	4.5	3.51	2 U	11000	274000		699	2 U	229 U
MW-17	11/02/2005	MW-17-BKG-003	N	57.1	0.5 U	127000	100	1.74	100 U	19000	3.37	3.81		10500	290000		681		
MW-17	12/22/2005	MW-17-BKG-004	N	153 J	0.5 U	122000	99.1	1.86	100 U	18100	4.37 J	3.22		10100	286000	4070	683		
MW-17	03/01/2006	MW-17-BKG-005	N	53.3	0.5 U	123000	99	1.71	100 U	18400	3.3	3.81		10400	294000		694		
MW-17	05/09/2006	MW-17-BKG-006	N	53.2	0.5 U	122000	104	1.92	100 U	18800	1 U	4.06		9410	249000		694		
MW-18	05/11/2005	MW-18-BKG-001	N	85.7	0.5 U		339	0.5 U				4.19	2 U				108	2 U	350 U
MW-18	05/11/2005	MW-18-WQ6	N			105000			298	16000	6.72			8700	178000				
MW-18	07/26/2005	MW-18-BKG-002	N	76	0.5 U	102000	337	0.633	100 U	15500	1 U	3.87	2 U	9160	178000		82.6	2 U	344 U
MW-18	11/03/2005	MW-18-BKG-003	N	5 U	0.5 U	93900	275	0.715	100 U	15300	1.1	3.65		8270	201000		78.2		
MW-18	02/09/2006	MW-18-BKG-004	N	78.4	0.5 U	71500	236	0.525	100 U	11200	2.02	3.81		6680	151000		80		
MW-18	03/01/2006	MW-18-BKG-005	N	82.4	0.5 U	73600	253	0.569	100 U	12200	1.91	3.78		6970	163000		98.7		
MW-18	05/01/2006	MW-18-BKG-006	N	96.1	0.5 U	71300	269	0.546	100 U	12700	1 U	3.75		7120	147000		86.6		
Needles MW-10	05/16/2005	MW-10-BKG-001	N	151	0.5 U	67200	98.6	0.627	100 U	23700	28.8	0.5 U	2 UJ	4010	134000		261	2 U	350 U
Needles MW-10	07/21/2005	Needles MW-10-BKG-002	N	155	0.5 U	78300	95.6	0.705	100 U	27700	30.8		2 U	5000	153000		262	2 U	165 U
Needles MW-10	11/03/2005	Needles MW-10-BKG-003	N	5 U	0.5 U	79500	97.3	0.716	100 U	28800	46.2	0.5 U		4740	148000		249		
Needles MW-10	12/20/2005	Needles MW-10-BKG-004	N	141	0.5 U	70700	90.5	0.644	100 U	25600	33.5	0.5 U		4350	138000		256		
Needles MW-10	02/22/2006	Needles MW-10-BKG-005	N	141	0.5 U	77900	90.6	0.771	112	26900	39.2	0.5 U		4360	154000		270		
Needles MW-10	05/02/2006	Needles MW-10-BKG-006	N	145	0.5 U	71800	94.2	0.685	100 U	27200	26.8	0.5 U		4060	138000		275		
Needles MW-11	05/16/2005	MW-11-BKG-001	N	205	0.5 U	94700	291	1.53	100 U	41200	20.4	1.57	2 U	11800	290000		428	2 U	350 U
Needles MW-11	07/21/2005	Needles MW-11-BKG-002	N	208	0.5 U	111000	281	1.36	100 U	48200	21.1	1.72 J	2 U	14100	338000		435	2 U	47.4 U
Needles MW-11	11/03/2005	Needles MW-11-BKG-003	N	5 U	0.5 U	123000	300	1.68	100 U	52700	20.9	1.71		14700	368000		436		
Needles MW-11	12/20/2005	Needles MW-11-BKG-004	N	197	0.5 U	103000	304	1.86	100 U	42600	5.2	1.83		12400	311000		430		
Needles MW-11	02/22/2006	Needles MW-11-BKG-005	N	195	0.5 U	111000	305	1.7	100 U	45800	16.8	1.85		12600	346000		436		
Needles MW-11	05/02/2006	Needles MW-11-BKG-006	N	209	0.5 U	100000	317	1.72	100 U	45500	15.9	1.7		12100	315000		463		
Needles MW-12	06/22/2005	Needles MW-12-BKG-001	N	205	0.5 U	132000	204	0.704	100 U	51800	602	0.5 U	2 U	8210	242000	2020	488	2 U	4.1 U
Needles MW-12	07/21/2005	Needles MW-12-BKG-002	N	236	0.5 U	144000	230	0.716	100 U	55700	567	0.687 J	2 U	9570	273000		524	2 U	118 U
Needles MW-12	11/03/2005	Needles MW-12-BKG-003	N	5 U	0.5 U	175000	242	0.839	100 U	70600	653	0.688		10600	331000		533		
Needles MW-12	12/20/2005	Needles MW-12-BKG-004	N	263	0.5 U	162000	287	1.08	100 U	66200	614	1.04		9820	312000		617		
Needles MW-12	02/22/2006	Needles MW-12-BKG-005	N	229	0.5 U	157000	265	0.821	100 U	59300	564	0.845		8880	306000		578		

Table A-2b. Groundwater Data Summary – Background – Other Chemicals

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Tritium pCi/L
Needles MW-12	05/02/2006	Needles MW-12-BKG-006	N	244	0.5 U	148000	269	0.883	100 U	63400	550	0.711		9420	300000		596		
New Farm Well	05/12/2005	New Farm Well-BKG-001	N	190	0.5 U	104000	108	0.5 U	460	32900	456	0.5 U	2 U	5180	128000		305	2 U	350 U
New Farm Well	07/20/2005	New Farm Well-BKG-002	N	205	0.5 U	114000	99.6	0.5 UJ	468	36600	505	0.5 U	2 U	5990	145000		304	2 U	-51.5 U
New Farm Well	11/01/2005	New Farm Well-BKG-003	N	195	0.5 U	119000	107	0.5 U	539	38600	516	0.5 U		5860	152000		321		
New Farm Well	12/21/2005	New Farm Well-BKG-004	N	199	0.5 U	119000	112	0.5 U	531	39400	544	0.5 UJ		5850	153000	1570	332		
New Farm Well	02/21/2006	New Farm Well-BKG-005	N	158	0.5 U	124000	108	0.5 U	538	37300	511	0.5 U		5680	160000		329		
New Farm Well	05/03/2006	New Farm Well-BKG-006	N	187	0.5 U	103000	104	0.5 U	413 U	33500	447	0.5 U		5270	133000		313		
P-2	05/13/2005	P-2-BKG-001	N	49.6	0.5 U	269000	1590	1.96	100 U	53100	1.44	2.52	2 U	10900	694000		176	2 U	350 U
P-2	07/26/2005	P-2-BKG-002	N	51.5	0.5 U	263000	1490	1.91	100 U	50600	1 U	2.6	4 U	10600	670000		209	2 U	33 U
P-2	11/30/2005	P-2-BKG-003	N	51.1	0.5 U	260000	1390	2.01	100 U	51700	1 U	2.52		10000	669000		191		
P-2	12/21/2005	P-2-BKG-004	N	48.7	0.5 U	266000	1460	1.75	100 U	52300	1 U	2.64 J		10200	690000	6250	202		
P-2	03/21/2006	P-2-BKG-005	N	56.4	0.5 U	249000	1490	1.98	100 U	51100	1.29	2.69		8920	645000		217		
P-2	05/04/2006	P-2-BKG-006	N	48.2	0.5 U	293000	1560	1.57	100 U	56300	1 U	2.14		10500	753000		216		
Park Moabi-3	05/18/2005	PMM-Supply-BKG-001	N	90.1	0.5 U	82000	297	2.32	100 U	16300	1.14	3.03	2 U	6520	149000		62.4	2 U	350 U
Park Moabi-3	07/21/2005	PMM-Supply-BKG-002	N	81.1	0.5 U	86100	314	2.18	100 U	16900	1 U	3.14 J	2 U	6810	155000		58.3	2 U	14.4 U
Park Moabi-3	11/02/2005	PMM-Supply-BKG-003	N	67.4	0.5 U	106000	402	2.28	144	21500	3.46	2.86		7230	181000		64		
Park Moabi-3	12/19/2005	PMM-Supply-BKG-004	N	82.7	0.5 U	87500	307	2.31	100 U	17400	1.13	3.02		6590	162000		61		
Park Moabi-3	02/22/2006	PMM-Supply-BKG-005	N	68.2	0.5 U	93900	323	2.26	100 U	17500	1.93	3.15		6410	173000		63.2		
Park Moabi-3	05/01/2006	PMM-SUPPLY-BKG-006	N	90.6	0.5 U	80400	321	2.11	100 U	17400	1 U	3.07		6280	148000		74.1		
PGE-9S	05/11/2005	PGE-9S-BKG-001	N	436	0.733	345000	4070	0.5 U	3410	152000	1080	0.1 U	2 UJ	20900	2710000		801	2 U	350 U
PGE-9S	07/20/2005	PGE-9S-BKG-002	N	583	1.06	383000	3420	0.5 UJ		154000	1950	0.5 U	10 U	17200	2330000		778	2 U	198 U
PGE-9S	10/31/2005	PGE-9S-BKG-003	N	507	0.618	412000	3970	0.866	3810	153000	1230	0.5 U		19300	2550000		975		
PGE-9S	12/20/2005	PGE-09S-BKG-004	N	508	0.5 U	411000	3740	0.5 U		150000	1260	0.5 U		20100	2590000		862		
PGE-9S	02/21/2006	PGE-09S-BKG-005	N	506	0.712 J	413000	3800	0.5 U	5070	155000	1110	0.5 U		19200	2750000		935		
PGE-9S	05/03/2006	PGE-09S-BKG-006	N	541	0.586	436000	4000	0.5 U	3970	158000	1260	0.5 U		19100	2770000		976		
Sanders	05/18/2005	Sanders-BKG-001	N	258	0.5 U	82100	357		100 U	10400	171	2.4	2 U	3760	374000		229	2 U	350 U
Sanders	07/25/2005	SANDERS-BKG-002	N	255	0.5 U	67700	306		100 U	8490	172	2.75 J	2 U	3810	370000		192	2 U	-109 U
Sanders	11/03/2005	Sanders-BKG-003	N	5 U	0.5 U	53000	259		100 U	6340	140	2.47		3570	351000		177		
Sanders	12/20/2005	Sanders-BKG-004	N	268	0.5 U	47700	251		100 U	5710	103	2.69		3320	342000		163		
Sanders	03/01/2006	Sanders-BKG-005	N	262	0.5 U	41300	253		100 U	5030	11.2	2.58		2890	358000		165		
Sanders	05/02/2006	Sanders-BKG-006	N	278	0.5 U	37000	273		100 U	5000	1.36	2.22		2920	346000		175		
Tayloe	05/16/2005	Tayloe-BKG-001	N	108	0.5 U	32100	135	0.677	100 U	5070	1 U	1.89	2 U	3660	132000		91.7	2 U	350 U
Tayloe	07/25/2005	TAYLOE-BKG-002	N	108	0.5 U	34600	137	0.726	100 U	5400	1 U	1.79 J	2 U	4130	145000		85.4	2 U	6.2 U
Tayloe	11/03/2005	Tayloe-BKG-003	N	5 U	0.5 U	34600	135	0.831	100 U	5400	1 U	1.17		3790	141000		87.3		
Tayloe	12/20/2005	Tayloe-BKG-004	N	109	0.5 U	36600	137	0.921	100 U	5950	5.3	1.36		4260	155000		83.9		
Tayloe	02/22/2006	Tayloe-BKG-005	N	105	0.5 U	36200	138	0.74	100 U	5310	1 U	1.5		3800	153000		85.8		
Tayloe	05/02/2006	Tayloe-BKG-006	N	107	0.5 U	34300	145	0.81	100 U	5790	1 U	1.83		3840	144000		88.4		
TMLP-2	05/12/2005	TMLP-2-BKG-001	N	151	0.5 U	21500	25.6	1.2	106	8810	2.38	3.63	2 U	5680	52600		17.4	2 U	350 U
TMLP-2	07/20/2005	TMLP-2-BKG-002	N	147	0.5 U	25600	24.4	1.22 J	100 U	10700	4.29	3.61	2 U	7000	62600		14.7	2 U	161 U
TMLP-2	11/01/2005	TMLP-2-BKG-003	N	135	0.5 U	22400	25.1	1.24	100 U	9740	2.4	3.54		6020	57800		15.4		
TMLP-2	12/19/2005	TMLP-2-BKG-004	N	146	0.5 U	23300	24.6	1.4	100 U	9740	2.23	3.58		6140	57900		15.7		
TMLP-2	02/23/2006	TMLP-2-BKG-005	N	133	0.5 U	24300	25.4	1.23	100 U	10500	2.73	3.61		6340	59100		16.3		
TMLP-2	05/01/2006	TMLP-2-BKG-006	N	148	0.5 U	22500	27	1.14	100 U	10200	2.8	3.58		6190	53300		16		
Topock-2	06/22/2005	Topock-2-BKG-001	N	75.8	0.5 U	48500	437	3.9	146	5780	2.51	1.8	2 U	7860	331000	937	118	2 U	18.5 U
Topock-2	07/21/2005	TOPOCK-2-BKG-002	N	81.1	0.5 U	41500	389	3.65	100 U	4770	1.54	1.93 J	2 U	7580	315000		102	2 U	59.8 U
Topock-2	11/02/2005	Topock-2-BKG-003	N	75.2	0.5 U	45400	378	3.6	100 U	5550	3.14	1.79		7450	293000		114		
Topock-2	12/19/2005	Topock-2-BKG-004	N	87.6	0.5 U	31300	262	3.83	100 U	4410	6.09	2.2		5880	231000		76.5		
Topock-2	02/23/2006	Topock-2-BKG-005	N	77.4	0.5 U	39600	317	3.96	100 U	6270	2.17	2.08		6640	268000		84.6		

Table A-2b. Groundwater Data Summary – Background – Other Chemicals

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Strontium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Tritium pCi/L
USFW-5	05/12/2005	USFW-5-BKG-001	N	145	0.5 U	77200	79.3	0.5 U	473	26600	266	0.5 U	2 U	4310	83900		220	2 U	350 U
USFW-5	07/20/2005	USFW-5-BKG-002	N	152	0.5 U	88200	76.2	0.5 UJ	431	31600	302	0.5 U	2 U	5170	99200		223	2 U	12.4 U
USFW-5	11/01/2005	USFW-5-BKG-003	N	135	0.5 U	100000	79.2	0.5 U	626	32800	322	0.5 U		5520	112000		237		
USFW-5	12/21/2005	USFW-5-BKG-004	N	141	0.5 U	89200	79.1	0.5 U	533	30900	301	0.5 UJ		5020	101000	1150	235		
USFW-5	02/21/2006	USFW-5-BKG-005	N	147	0.5 U	95600	81.2	0.5 U	561	30700	310	0.5 U		4920	110000		239		
USFW-5	05/03/2006	USFW-5-BKG-006	N	150	0.5 U	86900	85.1	0.5 U	480 U	30800	292	0.5 U		4800	98100		249		

Notes:

(1) Concentrations are reported in milligrams per liter (mg/L), micrograms per liter (µg/L) picocuries per liter (pCi/L).

(2) Sample types are as follows:

N = Primary sample

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

ARCADIS

Appendix B

Surface Water Data Summary

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
A-Dock	07/01/1997	A dock_07/01/1997	N	110	10 U	10 U	10 U	2 U	10 U	10 U	10 U	9
A-Dock	09/01/1997	A dock_09/01/1997	N		20 U	10 U	10 U			25 U		12
A-Dock	02/18/1998	A dock(D)_02/18/1998	FD		20 U	3 J	10 U			25 U		5 J
A-Dock	02/18/1998	A dock_02/18/1998	N		20 U	3 J	10 U			25 U		4 J
A-Dock	06/19/1998	A dock_06/19/1998	N		20 U	8.7 J	10 U			25 U		11 J
A-Dock	09/08/2003	A-DOCK-007	N		1 U		0.2 U					
A-Dock	02/17/2004	A-DOCK-014	N		1 U		0.2 U					
C-CON	07/13/2005	C-CON-D-074	N		1 U		0.2 U					
C-CON	07/13/2005	C-CON-M-074	N		1 U		0.2 U					
C-CON	07/13/2005	C-CON-S-074	N		1 U		0.2 U					
C-CON	09/22/2005	C-CON-D-080	N		1 U		0.2 U					
C-CON	09/22/2005	C-CON-M-080	N		1 U		0.2 U					
C-CON	09/22/2005	C-CON-S-080	N		1 U		0.2 U					
C-CON	11/08/2005	C-CON-D-084	N		1 U		0.2 U					
C-CON	11/08/2005	C-CON-M-084	N		1 U		0.2 U					
C-CON	11/08/2005	C-CON-S-084	N		1 U		0.2 U					
C-CON	12/13/2005	C-CON-D-087	N		1 U		0.2 U					
C-CON	12/13/2005	C-CON-M-087	N		1 U		0.2 U					
C-CON	12/13/2005	C-CON-S-087	N		1 U		0.2 U					
C-CON	01/18/2006	C-CON-D-090	N		1 U		0.2 U					
C-CON	01/18/2006	C-CON-M-090	N		1 U		0.2 U					
C-CON	01/18/2006	C-CON-S-090	N		1 U		0.2 U					
C-CON	03/22/2006	C-CON-D-094	N		1 U		0.2 U					
C-CON	03/22/2006	C-CON-M-094	N		1 U		0.2 U					
C-CON	03/22/2006	C-CON-S-094	N		1 U		0.2 U					
C-CON	06/15/2006	C-CON-D-102	N		1 U		0.2 U					
C-CON	06/15/2006	C-CON-M-102	N		1 U		0.2 U					
C-CON	06/15/2006	C-CON-S-102	N		1 U		0.2 U					
C-CON	10/03/2006	C-CON-D-110	N		1 U		0.2 U					
C-CON	10/03/2006	C-CON-M-110	N		1 U		0.2 U					
C-CON	10/03/2006	C-CON-S-110	N		1 U		0.2 U					
C-CON	11/16/2006	C-CON-D-113	N		1 U		0.2 U					
C-CON	11/16/2006	C-CON-M-113	N		1 U		0.2 U					
C-CON	11/16/2006	C-CON-S-113	N		1 U		0.2 U					
C-CON	12/19/2006	C-CON-D-115	N		1 U		0.2 U					
C-CON	12/19/2006	C-CON-M-115	N		1 U		0.2 U					
C-CON	12/19/2006	C-CON-S-115	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-CON	01/22/2007	C-CON-D-118	N		1 U		0.2 U					
C-CON	01/22/2007	C-CON-M-118	N		1 U		0.2 U					
C-CON	01/22/2007	C-CON-S-118	N		1 U		0.2 U					
C-CON	02/20/2007	C-CON-D-120	N		1 U		0.2 U					
C-CON	03/14/2007	C-CON-D-121	N		1 U		0.2 U					
C-CON	03/14/2007	C-CON-M-121	N		1 U		0.2 U					
C-CON	03/14/2007	C-CON-S-121	N		1 U		0.2 U					
C-CON	05/09/2007	C-CON-D-125	N		1 U		0.2 U					
C-CON	05/09/2007	C-CON-M-125	N		1 U		0.2 U					
C-CON	05/09/2007	C-CON-S-125	N		1 U		0.2 U					
C-CON	09/12/2007	C-CON-D-134	N		1 U		0.2 U					
C-CON	09/12/2007	C-CON-M-134	N		1 U		0.2 U					
C-CON	09/12/2007	C-CON-S-134	N		1 U		0.2 U					
C-CON	09/14/2007	C-CON-D-134-R	N		1 U		0.2 U					
C-CON	09/14/2007	C-CON-M-134-R	N		1 U		0.2 U					
C-CON	09/14/2007	C-CON-S-134-R	N		1 U		0.2 U					
C-CON	09/26/2007	C-CON-D-135	N		1 U		0.2 U					
C-CON	09/26/2007	C-CON-M-135	N		1 U		0.2 U					
C-CON	09/26/2007	C-CON-S-135	N		1 U		0.2 U					
C-CON	10/03/2007	C-CON-D-136	N		1 U		0.2 U					
C-CON	10/03/2007	C-CON-M-136	N		1 U		0.2 U					
C-CON	10/03/2007	C-CON-S-136	N		1 U		0.2 U					
C-I-3	07/13/2005	C-I-3-D-074	N		1 U		0.2 U					
C-I-3	07/13/2005	C-I-3-M-074	N		1 U		0.2 U					
C-I-3	07/13/2005	C-I-3-S-074	N		1 U		0.2 U					
C-I-3	09/21/2005	C-I-3-D-080	N		1 U		0.2 U					
C-I-3	09/21/2005	C-I-3-M-080	N		1 U		0.2 U					
C-I-3	09/21/2005	C-I-3-S-080	N		1 U		0.2 U					
C-I-3	11/08/2005	C-I-3-D-084	N		1 U		0.2 U					
C-I-3	11/08/2005	C-I-3-M-084	N		1 U		0.2 U					
C-I-3	11/08/2005	C-I-3-S-084	N		1 U		0.2 U					
C-I-3	12/13/2005	C-I-3-D-087	N		1 U		0.2 U					
C-I-3	12/13/2005	C-I-3-M-087	N		1 U		0.2 U					
C-I-3	12/13/2005	C-I-3-S-087	N		1 U		0.2 U					
C-I-3	01/19/2006	C-I-3-D-090	N		1 U		0.2 U					
C-I-3	01/19/2006	C-I-3-M-090	N		1 U		0.2 U					
C-I-3	01/19/2006	C-I-3-S-090	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-I-3	03/23/2006	C-I-3-D-094	N		1 U		0.2 U					
C-I-3	03/23/2006	C-I-3-M-094	N		1 U		0.2 U					
C-I-3	03/23/2006	C-I-3-S-094	N		1 U		0.2 U					
C-I-3	06/15/2006	C-I-3-D-102	N		1 U		0.2 U					
C-I-3	06/15/2006	C-I-3-M-102	N		1 U		0.2 U					
C-I-3	06/15/2006	C-I-3-S-102	N		1 U		0.2 U					
C-I-3	10/03/2006	C-I-3-D-110	N		1 U		0.2 U					
C-I-3	10/03/2006	C-I-3-M-110	N		1 U		0.2 U					
C-I-3	10/03/2006	C-I-3-S-110	N		1 U		0.2 U					
C-I-3	11/15/2006	C-I-3-D-113	N		1 U		0.2 U					
C-I-3	11/15/2006	C-I-3-M-113	N		1 U		0.2 U					
C-I-3	11/15/2006	C-I-3-S-113	N		1 U		0.2 U					
C-I-3	12/19/2006	C-I-3-D-115	N		1 U		0.2 U					
C-I-3	12/19/2006	C-I-3-M-115	N		1 U		0.2 U					
C-I-3	12/19/2006	C-I-3-S-115	N		1 U		0.2 U					
C-I-3	01/23/2007	C-I-3-D-118	N		1 U		0.2 U					
C-I-3	01/23/2007	C-I-3-M-118	N		1 U		0.2 U					
C-I-3	01/23/2007	C-I-3-S-118	N		1 U		0.2 U					
C-I-3	02/20/2007	C-I-3-D-120	N		1 U		0.2 U					
C-I-3	03/13/2007	C-I-3-D-121	N		1 U		0.2 U					
C-I-3	03/13/2007	C-I-3-M-121	N		1 U		0.2 U					
C-I-3	03/13/2007	C-I-3-S-121	N		1 U		0.2 U					
C-I-3	05/08/2007	C-I-3-D-125	N		1 U		0.2 U					
C-I-3	05/08/2007	C-I-3-M-125	N		1 U		0.2 U					
C-I-3	05/08/2007	C-I-3-S-125	N		1 U		0.2 U					
C-I-3	09/11/2007	C-I-3-D-134	N		1 U		0.2 U					
C-I-3	09/11/2007	C-I-3-M-134	N		1 U		0.2 U					
C-I-3	09/11/2007	C-I-3-S-134	N		1 U		0.2 U					
C-I-3	09/13/2007	C-I-3-D-134-R	N		1 U		0.2 U					
C-I-3	09/13/2007	C-I-3-M-134-R	N		1 U		0.2 U					
C-I-3	09/13/2007	C-I-3-S-134-R	N		1 U		0.2 U					
C-I-3	09/25/2007	C-I-3-D-135	N		1 U		0.2 U					
C-I-3	09/25/2007	C-I-3-M-135	N		1 U		0.2 U					
C-I-3	09/25/2007	C-I-3-S-135	N		1 U		0.2 U					
C-I-3	10/02/2007	C-I-3-D-136	N		1 U		0.2 U					
C-I-3	10/02/2007	C-I-3-M-136	N		1 U		0.2 U					
C-I-3	10/02/2007	C-I-3-S-136	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-MAR	09/21/2005	C-MAR-M-080	N		1 U		0.2 U					
C-MAR	11/09/2005	C-MAR-D-084	N		1 U		0.2 U					
C-MAR	11/09/2005	C-MAR-M-084	N		1 U		0.2 U					
C-MAR	11/09/2005	C-MAR-S-084	N		1 U		0.2 U					
C-MAR	12/13/2005	C-MAR-M-087	N		1 U		0.2 U					
C-MAR	01/19/2006	C-MAR-M-090	N		1 U		0.2 U					
C-MAR	03/23/2006	C-MAR-M-094	N		1 U		0.2 U					
C-MAR	06/15/2006	C-MAR-D-102	N		1 U		0.2 U					
C-MAR	06/15/2006	C-MAR-S-102	N		1 U		0.2 U					
C-MAR	10/03/2006	C-MAR-M-110	N		1 U		0.2 U					
C-MAR	11/16/2006	C-MAR-M-113	N		1 U		0.2 U					
C-MAR	12/19/2006	C-MAR-M-115	N		1 U		0.2 U					
C-MAR	01/23/2007	C-MAR-M-118	N		1 U		0.2 U					
C-MAR	02/20/2007	C-MAR-D-120	N		1 U		0.2 U					
C-MAR	03/13/2007	C-MAR-D-121	N		1 U		0.2 U					
C-MAR	03/13/2007	C-MAR-S-121	N		1 U		0.2 U					
C-MAR	05/09/2007	C-MAR-D-125	N		1 U		0.2 U					
C-MAR	05/09/2007	C-MAR-S-125	N		1 U		0.2 U					
C-MAR	09/11/2007	C-MAR-D-134	N		1 U		0.2 U					
C-MAR	09/11/2007	C-MAR-S-134	N		1 U		0.2 U					
C-MAR	09/13/2007	C-MAR-D-134-R	N		1 U		0.2 U					
C-MAR	09/13/2007	C-MAR-S-134-R	N		1 U		0.2 U					
C-MAR	09/26/2007	C-MAR-D-135	N		1 U		0.2 U					
C-MAR	09/26/2007	C-MAR-S-135	N		1 U		0.2 U					
C-MAR	10/02/2007	C-MAR-D-136	N		1 U		0.2 U					
C-MAR	10/02/2007	C-MAR-S-136	N		1 U		0.2 U					
C-NR1	07/13/2005	C-NR1-D-074	N		1 U		0.2 U					
C-NR1	07/13/2005	C-NR1-M-074	N		1 U		0.2 U					
C-NR1	07/13/2005	C-NR1-S-074	N		1 U		0.2 U					
C-NR1	09/22/2005	C-NR1-D-080	N		1 U		0.2 U					
C-NR1	09/22/2005	C-NR1-M-080	N		1 U		0.2 U					
C-NR1	09/22/2005	C-NR1-S-080	N		1 U		0.2 U					
C-NR1	11/09/2005	C-NR1-D-084	N		1 U		0.2 U					
C-NR1	11/09/2005	C-NR1-M-084	N		1 U		0.2 U					
C-NR1	11/09/2005	C-NR1-S-084	N		1 U		0.2 U					
C-NR1	12/14/2005	C-NR1-D-087	N		1 U		0.2 U					
C-NR1	12/14/2005	C-NR1-M-087	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-NR1	12/14/2005	C-NR1-S-087	N		1 U		0.2 U					
C-NR1	01/18/2006	C-NR1-D-090	N		1 U		0.2 U					
C-NR1	01/18/2006	C-NR1-M-090	N		1 U		0.2 U					
C-NR1	01/18/2006	C-NR1-S-090	N		1 U		0.2 U					
C-NR1	03/22/2006	C-NR1-D-094	N		1 U		0.2 U					
C-NR1	03/22/2006	C-NR1-M-094	N		1 U		0.2 U					
C-NR1	03/22/2006	C-NR1-S-094	N		1 U		0.2 U					
C-NR1	06/16/2006	C-NR1-D-102	N		1 U		0.2 U					
C-NR1	06/16/2006	C-NR1-M-102	N		1 U		0.2 U					
C-NR1	06/16/2006	C-NR1-S-102	N		1 U		0.2 U					
C-NR1	10/04/2006	C-NR1-D-110	N		1 U		0.2 U					
C-NR1	10/04/2006	C-NR1-M-110	N		1 U		0.2 U					
C-NR1	10/04/2006	C-NR1-S-110	N		1 U		0.2 U					
C-NR1	11/16/2006	C-NR1-D-113	N		1 U		0.2 U					
C-NR1	11/16/2006	C-NR1-M-113	N		1 U		0.2 U					
C-NR1	11/16/2006	C-NR1-S-113	N		1 U		0.2 U					
C-NR1	12/19/2006	C-NR1-D-115	N		1 U		0.2 U					
C-NR1	12/19/2006	C-NR1-M-115	N		1 U		0.2 U					
C-NR1	12/19/2006	C-NR1-S-115	N		1 U		0.2 U					
C-NR1	01/22/2007	C-NR1-D-118	N		1 U		0.2 U					
C-NR1	01/22/2007	C-NR1-M-118	N		1 U		0.2 U					
C-NR1	01/22/2007	C-NR1-S-118	N		1 U		0.2 U					
C-NR1	02/20/2007	C-NR1-D-120	N		1 U		0.2 U					
C-NR1	03/14/2007	C-NR1-D-121	N		1 U		0.2 U					
C-NR1	03/14/2007	C-NR1-M-121	N		1 U		0.2 U					
C-NR1	03/14/2007	C-NR1-S-121	N		1 U		0.2 U					
C-NR1	05/09/2007	C-NR1-D-125	N		1 U		0.2 U					
C-NR1	05/09/2007	C-NR1-M-125	N		1 U		0.2 U					
C-NR1	05/09/2007	C-NR1-S-125	N		1 U		0.2 U					
C-NR1	09/12/2007	C-NR1-D-134	N		1 U		0.2 U					
C-NR1	09/12/2007	C-NR1-M-134	N		1 U		0.2 U					
C-NR1	09/12/2007	C-NR1-S-134	N		1 U		0.2 U					
C-NR1	09/14/2007	C-NR1-D-134-R	N		1 U		0.2 U					
C-NR1	09/14/2007	C-NR1-M-134-R	N		1 U		0.2 U					
C-NR1	09/14/2007	C-NR1-S-134-R	N		1 U		0.2 U					
C-NR1	09/26/2007	C-NR1-D-135	N		1 U		0.2 U					
C-NR1	09/26/2007	C-NR1-M-135	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-NR1	09/26/2007	C-NR1-S-135	N		1 U		0.2 U					
C-NR1	10/03/2007	C-NR1-D-136	N		1 U		0.2 U					
C-NR1	10/03/2007	C-NR1-M-136	N		1 U		0.2 U					
C-NR1	10/03/2007	C-NR1-S-136	N		1 U		0.2 U					
C-NR3	07/14/2005	C-NR3-D-074	N		1 U		0.2 U					
C-NR3	07/14/2005	C-NR3-M-074	N		1 U		0.2 U					
C-NR3	07/14/2005	C-NR3-S-074	N		1 U		0.2 U					
C-NR3	09/22/2005	C-NR3-D-080	N		1 U		0.2 U					
C-NR3	09/22/2005	C-NR3-M-080	N		1 U		0.2 U					
C-NR3	09/22/2005	C-NR3-S-080	N		1 U		0.2 U					
C-NR3	11/09/2005	C-NR3-D-084	N		1 U		0.2 U					
C-NR3	11/09/2005	C-NR3-M-084	N		1 U		0.2 U					
C-NR3	11/09/2005	C-NR3-S-084	N		1 U		0.2 U					
C-NR3	12/14/2005	C-NR3-D-087	N		1 U		0.2 U					
C-NR3	12/14/2005	C-NR3-M-087	N		1 U		0.2 U					
C-NR3	12/14/2005	C-NR3-S-087	N		1 U		0.2 U					
C-NR3	01/18/2006	C-NR3-D-090	N		1 U		0.2 U					
C-NR3	01/18/2006	C-NR3-M-090	N		1 U		0.2 U					
C-NR3	01/18/2006	C-NR3-S-090	N		1 U		0.2 U					
C-NR3	03/22/2006	C-NR3-D-094	N		1 U		0.2 U					
C-NR3	03/22/2006	C-NR3-M-094	N		1 U		0.2 U					
C-NR3	03/22/2006	C-NR3-S-094	N		1 U		0.2 U					
C-NR3	06/16/2006	C-NR3-D-102	N		1 U		0.2 U					
C-NR3	06/16/2006	C-NR3-M-102	N		1 U		0.2 U					
C-NR3	06/16/2006	C-NR3-S-102	N		1 U		0.2 U					
C-NR3	10/04/2006	C-NR3-D-110	N		1 U		0.2 U					
C-NR3	10/04/2006	C-NR3-M-110	N		1 U		0.2 U					
C-NR3	10/04/2006	C-NR3-S-110	N		1 U		0.2 U					
C-NR3	11/16/2006	C-NR3-D-113	N		1 U		0.2 U					
C-NR3	11/16/2006	C-NR3-M-113	N		1 U		0.2 U					
C-NR3	11/16/2006	C-NR3-S-113	N		1 U		0.2 U					
C-NR3	12/19/2006	C-NR3-D-115	N		1 U		0.2 U					
C-NR3	12/19/2006	C-NR3-M-115	N		1 U		0.2 U					
C-NR3	12/19/2006	C-NR3-S-115	N		1 U		0.2 U					
C-NR3	01/22/2007	C-NR3-D-118	N		1 U		0.2 U					
C-NR3	01/22/2007	C-NR3-M-118	N		1 U		0.2 U					
C-NR3	01/22/2007	C-NR3-S-118	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-NR3	02/20/2007	C-NR3-D-120	N		1 U		0.2 U					
C-NR3	03/14/2007	C-NR3-D-121	N		1 U		0.2 U					
C-NR3	03/14/2007	C-NR3-M-121	N		1 U		0.2 U					
C-NR3	03/14/2007	C-NR3-S-121	N		1 U		0.2 U					
C-NR3	05/09/2007	C-NR3-D-125	N		1 U		0.2 U					
C-NR3	05/09/2007	C-NR3-M-125	N		1 U		0.2 U					
C-NR3	05/09/2007	C-NR3-S-125	N		1 U		0.2 U					
C-NR3	09/12/2007	C-NR3-D-134	N		1 U		0.2 U					
C-NR3	09/12/2007	C-NR3-M-134	N		1 U		0.2 U					
C-NR3	09/12/2007	C-NR3-S-134	N		1 U		0.2 U					
C-NR3	09/14/2007	C-NR3-D-134-R	N		1 U		0.2 U					
C-NR3	09/14/2007	C-NR3-M-134-R	N		1 U		0.2 U					
C-NR3	09/14/2007	C-NR3-S-134-R	N		1 U		0.2 U					
C-NR3	09/26/2007	C-NR3-D-135	N		1 U		0.2 U					
C-NR3	09/26/2007	C-NR3-M-135	N		1 U		0.2 U					
C-NR3	09/26/2007	C-NR3-S-135	N		1 U		0.2 U					
C-NR3	10/03/2007	C-NR3-D-136	N		1 U		0.2 U					
C-NR3	10/03/2007	C-NR3-M-136	N		1 U		0.2 U					
C-NR3	10/03/2007	C-NR3-S-136	N		1 U		0.2 U					
C-NR4	07/14/2005	C-NR4-D-074	N		1 U		0.2 U					
C-NR4	07/14/2005	C-NR4-M-074	N		1 U		0.2 U					
C-NR4	07/14/2005	C-NR4-S-074	N		1 U		0.2 U					
C-NR4	09/22/2005	C-NR4-D-080	N		1 U		0.2 U					
C-NR4	09/22/2005	C-NR4-M-080	N		1 U		0.2 U					
C-NR4	09/22/2005	C-NR4-S-080	N		1 U		0.2 U					
C-NR4	11/09/2005	C-NR4-D-084	N		1 U		0.2 U					
C-NR4	11/09/2005	C-NR4-M-084	N		1 U		0.2 U					
C-NR4	11/09/2005	C-NR4-S-084	N		1 U		0.2 U					
C-NR4	12/14/2005	C-NR4-D-087	N		1 U		0.2 U					
C-NR4	12/14/2005	C-NR4-M-087	N		1 U		0.2 U					
C-NR4	12/14/2005	C-NR4-S-087	N		1 U		0.2 U					
C-NR4	01/18/2006	C-NR4-D-090	N		1 U		0.2 U					
C-NR4	01/18/2006	C-NR4-M-090	N		1 U		0.2 U					
C-NR4	01/18/2006	C-NR4-S-090	N		1 U		0.2 U					
C-NR4	03/22/2006	C-NR4-D-094	N		1 U		0.2 U					
C-NR4	03/22/2006	C-NR4-M-094	N		1 U		0.2 U					
C-NR4	03/22/2006	C-NR4-S-094	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-NR4	06/16/2006	C-NR4-D-102	N		1 U		0.2 U					
C-NR4	06/16/2006	C-NR4-M-102	N		1 U		0.2 U					
C-NR4	06/16/2006	C-NR4-S-102	N		1 U		0.2 U					
C-NR4	10/04/2006	C-NR4-D-110	N		1 U		0.2 U					
C-NR4	10/04/2006	C-NR4-M-110	N		1 U		0.2 U					
C-NR4	10/04/2006	C-NR4-S-110	N		1 U		0.2 U					
C-NR4	11/16/2006	C-NR4-D-113	N		1 U		0.2 U					
C-NR4	11/16/2006	C-NR4-M-113	N		1 U		0.2 U					
C-NR4	11/16/2006	C-NR4-S-113	N		1 U		0.2 U					
C-NR4	12/20/2006	C-NR4-D-115	N		1 U		0.2 U					
C-NR4	12/20/2006	C-NR4-M-115	N		1 U		0.2 U					
C-NR4	12/20/2006	C-NR4-S-115	N		1 U		0.2 U					
C-NR4	01/22/2007	C-NR4-D-118	N		1 U		0.2 U					
C-NR4	01/22/2007	C-NR4-M-118	N		1 U		0.2 U					
C-NR4	01/22/2007	C-NR4-S-118	N		1 U		0.2 U					
C-NR4	02/20/2007	C-NR4-D-120	N		1 U		0.2 U					
C-NR4	03/14/2007	C-NR4-D-121	N		1 U		0.2 U					
C-NR4	03/14/2007	C-NR4-M-121	N		1 U		0.2 U					
C-NR4	03/14/2007	C-NR4-S-121	N		1 U		0.2 U					
C-NR4	03/14/2007	C-NR9-121	FD		1 U		0.2 U					
C-NR4	05/09/2007	C-NR4-D-125	N		1 U		0.2 U					
C-NR4	05/09/2007	C-NR4-M-125	N		1 U		0.2 U					
C-NR4	05/09/2007	C-NR4-S-125	N		1 U		0.2 U					
C-NR4	09/12/2007	C-NR4-D-134	N		1 U		0.2 U					
C-NR4	09/12/2007	C-NR4-M-134	N		1 U		0.2 U					
C-NR4	09/12/2007	C-NR4-S-134	N		1 U		0.2 U					
C-NR4	09/14/2007	C-NR4-D-134-R	N		1 U		0.2 U					
C-NR4	09/14/2007	C-NR4-M-134-R	N		1 U		0.2 U					
C-NR4	09/14/2007	C-NR4-S-134-R	N		1 U		0.2 U					
C-NR4	09/26/2007	C-NR4-D-135	N		1 U		0.2 U					
C-NR4	09/26/2007	C-NR4-M-135	N		1 U		0.2 U					
C-NR4	09/26/2007	C-NR4-S-135	N		1 U		0.2 U					
C-NR4	10/03/2007	C-NR4-D-136	N		1 U		0.2 U					
C-NR4	10/03/2007	C-NR4-M-136	N		1 U		0.2 U					
C-NR4	10/03/2007	C-NR4-S-136	N		1 U		0.2 U					
CON	07/01/1997	CON_07/01/1997	N	110	20 U	3.4 J	10 U	2 J	5 U	25 U	10 U	6.4
CON	09/01/1997	CON_09/01/1997	N		20 U	10 U	10 U			25 U		4 J

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
CON	02/18/1998	CON_02/18/1998	N		20 U	10 U	10 U			25 U		5 U
CON	06/19/1998	CON_06/19/1998	N		20 U	24	10 U			25 U		14 J
CON	09/04/1998	CON_09/04/1998	N		20 U	10 U	10 U			25 U		4.6 J
CON	09/04/1998	CON-B-0_09/04/1998	FD		20 U	10 U	10 U			25 U		5 U
CON	09/04/1998	CON-B-5_09/04/1998	N		20 U	10 U	10 U			25 U		3.9 J
CON	06/08/1999	CON_06/08/1999	N		20 U	3.1 J	10 U			25 U		5 U
CON	09/08/1999	CON_09/08/1999	N		20 U	10 U	10 U			25 U		5 U
CON	12/01/1999	CON_12/01/1999	N		20 U	1.7 J	10 UJ			1.9 J		11
CON	03/25/2000	CON_03/25/2000	N		20 U	4.2 J	10 U			2.4 J		4.4 J
CON	06/15/2000	CON_06/15/2000	N		20 U	5.8 J	10 U			5 U		10 U
CON	09/01/2000	CON_09/01/2000	N	110	20 U	9.5 J	10 U	5 U	8	3.1 J	3.1 J	7.5 J
CON	12/15/2000	CON_12/15/2000	N		20 U	3.7 J	10 U			1.4 J		5.7 J
CON	03/28/2001	CON_03/28/2001	N		20 U	10 U	10 U			1.2 J		5 J
CON	06/05/2001	CON_06/05/2001	N		20 U	10 U	10 U			1 J		5 U
CON	08/25/2001	CON_08/25/2001	N		20 U	5.4 J	10 U			2.1 J		43
CON	09/13/2001	CON_09/13/2001	N		20 U	4.1 J	10 U			2.9 J		14
CON	11/29/2001	CON_11/29/2001	N	100	20 U	2.5 J	10 U	5 U	4.3 J	5 U	2.3 J	46
CON	03/05/2002	CON-001_03/05/2002	N			5.1 J	10 U			4.7		19.2
CON	06/11/2002	CON-002_6/11/02	N		7.6	10 U				6.9		47.9
CON	08/06/2002	CON-RS_8/6/02	N		2.7		10 U					
CON	08/06/2002	MW-40-RS_8/6/02	FD		3.2		10 U					
CON	09/18/2002	CON-003	N		4	20 U	10 U			5 U		308
CON	12/12/2002	CON_12/12/02_LS	N		7.3	20 U	10 U			27.8 U		174
CON	03/20/2003	CON-005	N		13.3	11 U	10 U			27.8 U		245
CON	06/11/2003	CON-006	N	500 U	3 J	10 U	10 U			26.1 U		127
CON	09/08/2003	CON-007	N		1 U	11 U	0.2 U			26.1 U		63.1
CON	12/08/2003	CON-009	N		1 U	10 U	0.2 U			20 U		40.1
CON	02/17/2004	CON-014	N		1 U		0.2 U					
CON	03/15/2004	CON-018	N		1 U	10 U	0.2 U			20 U		96.7
CON	04/14/2004	CON-022	N		3.3 U		0.2 U					
CON	05/12/2004	CON-026	N		1 U		0.2 U					
CON	06/10/2004	CON-030	N		1 U	10.4 U	0.2 U			20 U		28.9 U
CON	07/15/2004	CON-035	N		1 U		0.2 U					
CON	08/10/2004	CON-039	N		1 U		0.2 U					
CON	09/23/2004	CON-043	N		1 U		0.2 U					
CON	10/19/2004	CON-045	N		1 U		0.2 U					
CON	11/15/2004	CON-047	N		1 U							

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
CON	12/13/2004	CON-049	N		1 U		0.2 U					
CON	01/10/2005	CON	N		1 U		0.2 U					
CON	02/08/2005	CON-053	N		1 U		0.2 U					
CON	02/24/2005	CON-054	N		1 U		0.2 U					
CON	03/01/2005	CON-055	N		1 UJ		0.2 U					
CON	03/07/2005	CON-056	N		1 U		0.2 U					
CON	03/14/2005	CON-057	N		1 U		0.2 U					
CON	04/06/2005	CON-060	N		1 U		0.2 U					
CON	05/04/2005	CON-064	N		1 U		0.2 U					
CON	06/14/2005	CON-070	N		1 U		0.2 U					
CON	07/13/2005	CON-074	N		1 U		0.2 U					
CON	08/18/2005	CON-077	N		1 U		0.2 U					
CON	09/07/2005	CON-079	N		1 U		0.2 U					
CON	10/05/2005	CON-081	N		1 U		0.2 U					
CON	11/01/2005	CON-083	N		1 U		0.2 U					
CON	12/15/2005	CON-087	N		1 U		0.2 U					
CON	01/11/2006	CON-089	N		1 U		0.2 U					
CON	02/09/2006	CON-091	N		1 U		0.2 U					
CON	03/06/2006	CON-093	N		1 U		0.2 U					
CON	04/07/2006	CON-095	N		1 U		0.2 U					
CON	05/03/2006	CON-098	N		1 U		0.2 U					
CON	06/15/2006	CON-102	N		1 U		0.2 U					
CON	07/12/2006	CON-104	N		1 U		0.2 UJ					
CON	08/08/2006	CON-106	N		1 U		0.2 U					
CON	09/06/2006	CON-108	N		1 U		0.2 U					
CON	10/04/2006	CON-110	N		1 U		0.2 U					
CON	11/15/2006	CON-113	N		1 U		0.2 U					
CON	12/20/2006	CON-115	N		1 U		0.2 U					
CON	01/22/2007	CON-118	N		1 U		0.2 U					
CON	03/14/2007	CON-121	N		1 U		0.2 U					
CON	05/09/2007	CON-125	N		1 U		0.2 U					
CON	09/12/2007	CON-134	N		1 U		0.2 U					
CON	09/14/2007	CON-134-R	N		1 U		0.2 U					
CON	09/26/2007	CON-135	N		1 U		0.2 U					
CON	10/03/2007	CON-136	N		1 U		0.2 U					
C-R22	07/13/2005	C-R22-D-074	N		1 U		0.2 U					
C-R22	07/13/2005	C-R22-M-074	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-R22	07/13/2005	C-R22-S-074	N		1 U		0.2 U					
C-R22	09/21/2005	C-R22-D-080	N		1 U		0.2 U					
C-R22	09/21/2005	C-R22-M-080	N		1 U		0.2 U					
C-R22	09/21/2005	C-R22-S-080	N		1 U		0.2 U					
C-R22	11/08/2005	C-R22-D-084	N		1 U		0.2 U					
C-R22	11/08/2005	C-R22-M-084	N		1 U		0.2 U					
C-R22	11/08/2005	C-R22-S-084	N		1 U		0.2 U					
C-R22	12/13/2005	C-R22-D-087	N		1 U		0.2 U					
C-R22	12/13/2005	C-R22-M-087	N		1 U		0.2 U					
C-R22	12/13/2005	C-R22-S-087	N		1 U		0.2 U					
C-R22	01/19/2006	C-R22-D-090	N		1 U		0.2 U					
C-R22	01/19/2006	C-R22-M-090	N		1 U		0.2 U					
C-R22	01/19/2006	C-R22-S-090	N		1 U		0.2 U					
C-R22	03/23/2006	C-R22-D-094	N		1 U		0.2 U					
C-R22	03/23/2006	C-R22-M-094	N		1 U		0.2 U					
C-R22	03/23/2006	C-R22-S-094	N		1 U		0.2 U					
C-R22	06/15/2006	C-R22-D-102	N		1 U		0.2 U					
C-R22	06/15/2006	C-R22-M-102	N		1 U		0.2 U					
C-R22	06/15/2006	C-R22-S-102	N		1 U		0.2 U					
C-R22	10/03/2006	C-R22-D-110	N		1 U		0.2 U					
C-R22	10/03/2006	C-R22-M-110	N		1 U		0.2 U					
C-R22	10/03/2006	C-R22-S-110	N		1 U		0.2 U					
C-R22	11/15/2006	C-R22-D-113	N		1 U		0.2 U					
C-R22	11/15/2006	C-R22-M-113	N		1 U		0.2 U					
C-R22	11/15/2006	C-R22-S-113	N		1 U		0.2 U					
C-R22	12/19/2006	C-R22-D-115	N		1 U		0.2 U					
C-R22	12/19/2006	C-R22-M-115	N		1 U		0.2 U					
C-R22	12/19/2006	C-R22-S-115	N		1 U		0.2 U					
C-R22	01/23/2007	C-R22-D-118	N		1 U		0.2 U					
C-R22	01/23/2007	C-R22-M-118	N		1 U		0.2 U					
C-R22	01/23/2007	C-R22-S-118	N		1 U		0.2 U					
C-R22	02/20/2007	C-R22-D-120	N		1 U		0.2 U					
C-R22	03/13/2007	C-R22-D-121	N		1 U		0.2 U					
C-R22	03/13/2007	C-R22-M-121	N		1 U		0.2 U					
C-R22	03/13/2007	C-R22-S-121	N		1 U		0.2 U					
C-R22	05/08/2007	C-R22-D-125	N		1 U		0.2 U					
C-R22	05/08/2007	C-R22-M-125	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-R22	05/08/2007	C-R22-S-125	N		1 U		0.2 U					
C-R22	09/11/2007	C-R22-D-134	N		1 U		0.4 J					
C-R22	09/11/2007	C-R22-M-134	N		1 U		0.2 U					
C-R22	09/11/2007	C-R22-S-134	N		1 U		0.2 U					
C-R22	09/12/2007	C-R22-D-134-R	N		1 U		0.2 U					
C-R22	09/12/2007	C-R22-D-134-R-E	N		1 U		0.2 U					
C-R22	09/12/2007	C-R22-D-134-R-N	N		1 U		0.2 U					
C-R22	09/12/2007	C-R22-D-134-R-S	N		1 U		0.2 U					
C-R22	09/12/2007	C-R22-D-134-R-W	N		1 U		1 U					
C-R22	09/12/2007	C-R22-M-134-R	N		1 U		0.2 U					
C-R22	09/12/2007	C-R22-S-134-R	N		1 U		1 U					
C-R22	09/13/2007	C-R22-D-134-R2	N		1 U		0.2 U					
C-R22	09/13/2007	C-R22-M-134-R2	N		1 U		0.2 U					
C-R22	09/13/2007	C-R22-S-134-R2	N		1 U		0.2 U					
C-R22	09/25/2007	C-R22-D-135	N		1 U		0.2 U					
C-R22	09/25/2007	C-R22-M-135	N		1 U		0.2 U					
C-R22	09/25/2007	C-R22-S-135	N		1 U		0.2 U					
C-R22	10/02/2007	C-R22-D-136	N		1 U		0.2 U					
C-R22	10/02/2007	C-R22-M-136	N		1 U		0.2 U					
C-R22	10/02/2007	C-R22-S-136	N		1 U		0.2 U					
C-R27	07/13/2005	C-R27-D-074	N		1 U		0.2 U					
C-R27	07/13/2005	C-R27-M-074	N		1 U		0.2 U					
C-R27	07/13/2005	C-R27-S-074	N		1 U		0.2 U					
C-R27	09/21/2005	C-R27-D-080	N		1 U		0.2 U					
C-R27	09/21/2005	C-R27-M-080	N		1 U		0.2 U					
C-R27	09/21/2005	C-R27-S-080	N		1 U		0.2 U					
C-R27	11/08/2005	C-R27-D-084	N		1 U		0.2 U					
C-R27	11/08/2005	C-R27-M-084	N		1 U		0.2 U					
C-R27	11/08/2005	C-R27-S-084	N		1 U		0.2 U					
C-R27	12/13/2005	C-R27-D-087	N		1 U		0.2 U					
C-R27	12/13/2005	C-R27-M-087	N		1 U		0.2 U					
C-R27	12/13/2005	C-R27-S-087	N		1 U		0.2 U					
C-R27	01/19/2006	C-R27-D-090	N		1 U		0.2 U					
C-R27	01/19/2006	C-R27-M-090	N		1 U		0.2 U					
C-R27	01/19/2006	C-R27-S-090	N		1 U		0.2 U					
C-R27	03/23/2006	C-R27-M-094	N		1 U		0.2 U					
C-R27	06/15/2006	C-R27-D-102	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-R27	06/15/2006	C-R27-M-102	N		1 U		0.2 U					
C-R27	06/15/2006	C-R27-S-102	N		1 U		0.2 U					
C-R27	10/03/2006	C-R27-D-110	N		1 U		0.2 U					
C-R27	10/03/2006	C-R27-M-110	N		1 U		0.2 U					
C-R27	10/03/2006	C-R27-S-110	N		1 U		0.2 U					
C-R27	11/16/2006	C-R27-D-113	N		1 U		0.2 U					
C-R27	11/16/2006	C-R27-S-113	N		1 U		0.2 U					
C-R27	12/19/2006	C-R27-M-115	N		1 U		0.2 U					
C-R27	01/23/2007	C-R27-D-118	N		1 U		0.2 U					
C-R27	01/23/2007	C-R27-M-118	N		1 U		0.2 U					
C-R27	01/23/2007	C-R27-S-118	N		1 U		0.2 U					
C-R27	02/20/2007	C-R27-D-120	N		1 U		0.2 U					
C-R27	03/13/2007	C-R27-D-121	N		1 U		0.2 U					
C-R27	03/13/2007	C-R27-M-121	N		1 U		0.2 U					
C-R27	03/13/2007	C-R27-S-121	N		1 U		0.2 U					
C-R27	05/08/2007	C-R27-D-125	N		1 U		0.2 U					
C-R27	05/08/2007	C-R27-M-125	N		1 U		1 U					
C-R27	05/08/2007	C-R27-S-125	N		1 U		1 U					
C-R27	09/11/2007	C-R27-D-134	N		1 U		0.2 U					
C-R27	09/11/2007	C-R27-M-134	N		1 U		0.2 U					
C-R27	09/11/2007	C-R27-S-134	N		1 U		0.2 U					
C-R27	09/13/2007	C-R27-D-134-R	N		1 U		0.2 U					
C-R27	09/13/2007	C-R27-M-134-R	N		1 U		0.2 U					
C-R27	09/13/2007	C-R27-S-134-R	N		1 U		0.2 U					
C-R27	09/25/2007	C-R27-D-135	N		1 U		0.2 U					
C-R27	09/25/2007	C-R27-M-135	N		1 U		0.2 U					
C-R27	09/25/2007	C-R27-S-135	N		1 U		0.2 U					
C-R27	10/02/2007	C-R27-D-136	N		1 U		0.2 U					
C-R27	10/02/2007	C-R27-M-136	N		1 U		0.2 U					
C-R27	10/02/2007	C-R27-S-136	N		1 U		0.2 U					
C-TAZ	07/13/2005	C-TAZ-D-074	N		1 U		0.2 U					
C-TAZ	07/13/2005	C-TAZ-M-074	N		1 U		0.2 U					
C-TAZ	07/13/2005	C-TAZ-S-074	N		1 U		0.2 U					
C-TAZ	09/21/2005	C-TAZ-D-080	N		1 U		0.2 U					
C-TAZ	09/21/2005	C-TAZ-M-080	N		1 U		0.2 U					
C-TAZ	09/21/2005	C-TAZ-S-080	N		1 U		0.2 U					
C-TAZ	11/08/2005	C-TAZ-D-084	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-TAZ	11/08/2005	C-TAZ-M-084	N		1 U		0.2 U					
C-TAZ	11/08/2005	C-TAZ-S-084	N		1 U		0.2 U					
C-TAZ	12/13/2005	C-TAZ-D-087	N		1 U		0.2 U					
C-TAZ	12/13/2005	C-TAZ-M-087	N		1 U		0.2 U					
C-TAZ	12/13/2005	C-TAZ-S-087	N		1 U		0.2 U					
C-TAZ	01/19/2006	C-TAZ-D-090	N		1 U							
C-TAZ	01/19/2006	C-TAZ-M-090	N		1 U							
C-TAZ	01/19/2006	C-TAZ-S-090	N		1 U							
C-TAZ	03/23/2006	C-TAZ-D-094	N		1 U		0.2 U					
C-TAZ	03/23/2006	C-TAZ-M-094	N		1 U		0.2 U					
C-TAZ	03/23/2006	C-TAZ-S-094	N		1 U		0.2 U					
C-TAZ	06/15/2006	C-TAZ-D-102	N		1 U		0.2 U					
C-TAZ	06/15/2006	C-TAZ-M-102	N		1 U		0.2 U					
C-TAZ	06/15/2006	C-TAZ-S-102	N		1 U		0.2 U					
C-TAZ	10/03/2006	C-TAZ-D-110	N		1 U		0.2 U					
C-TAZ	10/03/2006	C-TAZ-M-110	N		1 U		0.2 U					
C-TAZ	10/03/2006	C-TAZ-S-110	N		1 U		0.2 U					
C-TAZ	11/15/2006	C-TAZ-D-113	N		1 U		0.2 U					
C-TAZ	11/15/2006	C-TAZ-M-113	N		1 U		0.2 U					
C-TAZ	11/15/2006	C-TAZ-S-113	N		1 U		0.2 U					
C-TAZ	12/19/2006	C-TAZ-D-115	N		1 U		0.2 U					
C-TAZ	12/19/2006	C-TAZ-M-115	N		1 U		0.2 U					
C-TAZ	12/19/2006	C-TAZ-S-115	N		1 U		0.2 U					
C-TAZ	01/23/2007	C-TAZ-D-118	N		1 U		0.2 U					
C-TAZ	01/23/2007	C-TAZ-M-118	N		1 U		0.2 U					
C-TAZ	01/23/2007	C-TAZ-S-118	N		1 U		0.2 U					
C-TAZ	02/20/2007	C-TAZ-D-120	N		1 U		0.2 U					
C-TAZ	03/13/2007	C-TAZ-D-121	N		1 U		0.2 U					
C-TAZ	03/13/2007	C-TAZ-M-121	N		1 U		0.2 U					
C-TAZ	03/13/2007	C-TAZ-S-121	N		1 U		0.2 U					
C-TAZ	05/08/2007	C-TAZ-D-125	N		1 U		0.2 U					
C-TAZ	05/08/2007	C-TAZ-M-125	N		1 U		0.2 U					
C-TAZ	05/08/2007	C-TAZ-S-125	N		1 U		0.2 U					
C-TAZ	09/11/2007	C-TAZ-D-134	N		1 U		0.2 U					
C-TAZ	09/11/2007	C-TAZ-M-134	N		1 U		0.2 U					
C-TAZ	09/11/2007	C-TAZ-S-134	N		1 U		0.2 U					
C-TAZ	09/13/2007	C-TAZ-D-134-R	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
C-TAZ	09/13/2007	C-TAZ-M-134-R	N		1 U		0.2 U					
C-TAZ	09/13/2007	C-TAZ-S-134-R	N		1 U		0.2 U					
C-TAZ	09/25/2007	C-TAZ-D-135	N		1 U		0.2 U					
C-TAZ	09/25/2007	C-TAZ-M-135	N		1 U		0.2 U					
C-TAZ	09/25/2007	C-TAZ-S-135	N		1 U		0.2 U					
C-TAZ	10/02/2007	C-TAZ-D-136	N		1 U		0.2 U					
C-TAZ	10/02/2007	C-TAZ-M-136	N		1 U		0.2 U					
C-TAZ	10/02/2007	C-TAZ-S-136	N		1 U		0.2 U					
I-3	07/01/1997	I3_07/01/1997	N	110	20 U	5 J	10 U	5 U	5	25 U	10 U	8
I-3	07/01/1997	I3_07/01/1997_LFS	N	100	10 U	10 U	10 U	2 U	10 U	25 U	10 U	6
I-3	09/01/1997	I3_09/01/1997	N		20 U	10 U	10 U			25 U		3.9 J
I-3	02/18/1998	I3_02/18/1998	N		20 U	10 U	10 U			25 U		5 U
I-3	06/19/1998	I3_06/19/1998	N		20 U	3.6 J	10 U			25 U		7.8 J
I-3	06/08/1999	I3_06/08/1999	N		20 U	3.5 J	10 U			25 U		6
I-3	09/01/1999	I3_09/01/1999	N		20 U	10 U	10 U			25 U		5 U
I-3	12/01/1999	I3_12/01/1999	N		20 U	4.2 J	10 U			25 U		5 U
I-3	03/25/2000	I3_03/25/2000	N		20 U	5.1 J	10 U			3 J		13
I-3	06/15/2000	I3_06/15/2000	N		20 U	4.3 J	10 U			5 U		10 U
I-3	09/01/2000	I-3_09/01/2000	N	110	20 U	3.8 J	10 U	5 U	5 J	2.1 J	2.4 J	5 U
I-3	12/15/2000	I3_12/15/2000	N		20 U	4.3 J	10 U			5 U		4.2 J
I-3	03/28/2001	I-3_03/28/2001	N		20 U	5.2 J	10 U			2.3 J		12
I-3	06/05/2001	I-3_06/05/2001	N		20 U	10 U	10 U			1 J		10
I-3	08/25/2001	I-3_08/25/2001	N		20 U	4.5 J	10 U			1.8 J		33
I-3	09/13/2001	I-3_09/13/2001	N		20 U	11	10 U			2.1 J		65
I-3	11/29/2001	I-3_11/29/2001	N	110	20 U	10 U	10 U	5 U	4.2 J	5 U	2.2 J	9.3 J
I-3	03/05/2002	I-3-001_03/05/2002	N			6.5	10 U			4.9		71.1
I-3	06/11/2002	I-3-002_6/11/02	N		3.5	10 U				5 U		26
I-3	08/06/2002	I-3-RS_8/6/02	N		6.1		10 U					
I-3	09/18/2002	I-3-003	N		4.4	20 U	10 U			5 U		96
I-3	12/12/2002	I-3_12/12/02_LS	N		5.7	20 U	10 U			27.8 U		84.7
I-3	03/19/2003	I-3-005	N		13.5	11 U	10 U			27.8 U		63
I-3	06/10/2003	I-3-006	N	500 U	3.4 J	10 U	10 UJ			26.1 U		93.6
I-3	09/08/2003	I-3-007	N		1 U	11 U	0.2 U			26.1 U		158
I-3	12/08/2003	I3-009	N		1 U	10 U	0.2 U			20 U		59.2
I-3	02/16/2004	I-3-014	N		1 U		0.2 U					
I-3	03/15/2004	I-3-018	N		1 U	10 U	0.2 U			20 U		144 J
I-3	04/13/2004	I3-022	N		1.6		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
I-3	05/13/2004	I-3-026	N		1 U		0.2 U					
I-3	06/10/2004	I-3-030	N	170	1 U	10.4 U	0.2 U			20 U		23.9 U
I-3	07/15/2004	I-3-035	N		1 U		0.2 U					
I-3	08/10/2004	I-3-039	N		1 U		0.2 U					
I-3	09/23/2004	I-3-043	N		1 U		0.2 U					
I-3	10/19/2004	I-3-045	N		1 U		0.2 U					
I-3	11/15/2004	I-3-047	N		1 U							
I-3	12/13/2004	I-3-049	N		1 U		0.2 U					
I-3	01/10/2005	I-3	N		1 U		0.2 U					
I-3	02/08/2005	I-3-053	N		1 U		0.2 U					
I-3	03/08/2005	I-3-056	N		1 U		0.2 U					
I-3	04/07/2005	I-3-060	N		1 U		0.2 U					
I-3	05/04/2005	I-3-064	N		1 U		0.2 U					
I-3	06/14/2005	I-3-070	N		1 U		0.2 U					
I-3	07/13/2005	I-3-074	N		1 U		0.2 U					
I-3	08/18/2005	I-3-077	N		1 U		0.2 U					
I-3	09/07/2005	I-3-079	N		1 U		0.2 U					
I-3	10/05/2005	I-3-081	N		1 U		0.2 U					
I-3	11/01/2005	I-3-083	N		1 U		0.2 U					
I-3	12/15/2005	I-3-087	N		1 U		0.2 U					
I-3	01/11/2006	I-3-089	N		1 U		0.2 U					
I-3	02/10/2006	I-3-091	N		1 U		0.2 U					
I-3	03/06/2006	I-3-093	N		1 U		0.2 U					
I-3	04/07/2006	I-3-095	N		1 U		0.2 U					
I-3	05/03/2006	I-3-098	N		1 U		0.2 U					
I-3	06/15/2006	I-3-102	N		1 U		0.2 U					
I-3	07/12/2006	I-3-104	N		1 U		0.2 U					
I-3	08/10/2006	I-3-106	N		1 U		0.2 U					
I-3	09/06/2006	I-3-108	N		1 U		0.2 U					
I-3	10/04/2006	I-3-110	N		1 U		0.2 U					
I-3	11/15/2006	I-3-113	N		1 U		0.2 U					
I-3	12/20/2006	I-3-115	N		1 U		0.2 U					
I-3	01/22/2007	I-3-118	N		1 U		0.2 U					
I-3	03/13/2007	I-3-121	N		1 U		0.2 U					
I-3	05/08/2007	I-3-125	N		1 U		0.2 U					
I-3	09/11/2007	I-3-134	N		1 U		0.2 U					
I-3	09/13/2007	I-3-134-R	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
I-3	09/25/2007	I-3-135	N		1 U		0.2 U					
I-3	10/02/2007	I-3-136	N		1 U		0.2 U					
Needles Gauge	09/08/2003	NEEDLES-1-007	N		1 U		0.2 U					
Needles Gauge	02/16/2004	Needles-1-014	N		1 U		0.2 U					
NR-1	08/06/2002	NR1-RS_8/6/02	N		6.1		10 U					
NR-1	09/08/2003	NR-1-007	N		1 U		0.2 U					
NR-1	02/16/2004	NR-1-014	N		1 U		0.2 U					
NR-1	03/16/2004	NR-1-018	N		1 U	10 U	0.2 U			20 U		70.7
NR-1	04/13/2004	NR-1-022	N		1 U		0.2 U					
NR-1	05/13/2004	NR-1-026	N		1 U		0.2 U					
NR-1	06/11/2004	NR-1-030	N	140	1 U	10.4 U	0.2 U			20 U		62.9 U
NR-1	07/15/2004	NR-1-035	N		1 U		0.2 U					
NR-1	08/10/2004	NR-1-039	N		1 U		0.2 U					
NR-1	09/23/2004	NR-1-043	N		1 U		0.2 U					
NR-1	10/19/2004	NR-1-045	N		1 U		0.2 U					
NR-1	11/15/2004	NR-1-047	N		1 U							
NR-1	12/13/2004	NR-1-049	N		1 U		0.2 U					
NR-1	01/10/2005	NR-1	N		1 U		0.2 U					
NR-1	02/08/2005	NR1-053	N		1 U		0.2 U					
NR-1	03/08/2005	NR-1-056	N		1 U		0.2 U					
NR-1	04/06/2005	NR-1-060	N		1 U		0.2 U					
NR-1	05/04/2005	NR-1-064	N		1 U		0.2 U					
NR-1	06/14/2005	NR-1-070	N		1 U		0.2 U					
NR-1	07/13/2005	NR1-074	N		1 U		0.2 U					
NR-1	08/18/2005	NR-1-077	N		1 U		0.2 U					
NR-1	09/07/2005	NR-1-079	N		1 U		0.2 U					
NR-1	10/05/2005	NR-1-081	N		1 U		0.2 U					
NR-1	11/01/2005	NR-1-083	N		1 U		0.2 U					
NR-1	12/15/2005	NR-1-087	N		1 U		0.2 U					
NR-1	01/10/2006	NR-1-089	N		1 U		0.2 U					
NR-1	02/07/2006	NR-1-091	N		1 U		0.2 U					
NR-1	03/06/2006	NR-1-093	N		1 U		0.2 U					
NR-1	04/07/2006	NR-1-095	N		1 U		0.2 UJ					
NR-1	05/03/2006	NR-1-098	N		1 U		0.2 U					
NR-1	06/16/2006	NR-1-102	N		1 U		0.2 U					
NR-1	07/13/2006	NR-1-104	N		1 U		0.2 U					
NR-1	08/08/2006	NR-1-106	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
NR-1	09/06/2006	NR-1-108	N		1 U		0.2 U					
NR-1	10/04/2006	NR-1-110	N		1 U		0.2 U					
NR-1	11/15/2006	NR-1-113	N		1 U		0.2 U					
NR-1	12/20/2006	NR-1-115	N		1 U		0.2 U					
NR-1	01/22/2007	NR-1-118	N		1 U		0.2 U					
NR-1	03/14/2007	NR-1-121	N		1 U		0.2 U					
NR-1	05/09/2007	NR-1-125	N		1 U		0.2 U					
NR-1	09/12/2007	NR-1-134	N		1 U		0.2 U					
NR-1	09/14/2007	NR-1-134-R	N		1 U		0.2 U					
NR-1	09/26/2007	NR-1-135	N		1 U		0.2 U					
NR-1	10/03/2007	NR-1-136	N		1 U		0.2 U					
NR-2	08/06/2002	NR2-RS_8/6/02	N		7.1		10 U					
NR-2	09/08/2003	NR-2-007	N		1 U		0.2 U					
NR-2	02/16/2004	NR-2-014	N		1 U		0.2 U					
NR-2	03/16/2004	NR-2-018	N		1 U	10 U	1 U			20 U		60.8
NR-2	04/13/2004	NR-2-022	N		1 U		0.2 U					
NR-2	05/13/2004	NR-2-026	N		1 U		0.2 U					
NR-2	06/11/2004	NR-2-030	N		1 U	10.4 U	0.2 U			20 U		97.1 U
NR-2	07/15/2004	NR-2-035	N		1 U		0.2 U					
NR-2	08/10/2004	NR-2-039	N		1 U		0.2 U					
NR-2	09/23/2004	NR-2-043	N		1 U		0.2 U					
NR-2	10/19/2004	NR-2-045	N		1 U		0.2 U					
NR-2	11/15/2004	NR-2-047	N		1 U							
NR-2	12/13/2004	NR-2-049	N		1 U		0.2 U					
NR-2	01/10/2005	NR-2	N		1 U		0.2 U					
NR-2	02/08/2005	NR2-053	N		1 U		0.2 U					
NR-2	03/08/2005	NR-2-056	N		1 U		0.2 U					
NR-2	04/06/2005	NR-2-060	N		1 U		0.2 U					
NR-2	05/04/2005	NR-2-064	N		1 U		0.2 U					
NR-2	06/14/2005	NR-2-070	N		1 U		0.2 U					
NR-2	07/14/2005	NR-2-074	N		1 U		0.2 U					
NR-2	08/18/2005	NR-2-077	N		1 U		0.2 U					
NR-2	09/07/2005	NR-2-079	N		1 U		0.2 U					
NR-2	10/05/2005	NR-2-081	N		1 U		0.2 U					
NR-2	11/01/2005	NR-2-083	N		1 U		0.2 U					
NR-2	12/15/2005	NR-2-087	N		1 U		0.2 U					
NR-2	01/10/2006	NR-2-089	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
NR-2	02/07/2006	NR-2-091	N		1 U		0.2 U					
NR-2	03/06/2006	NR-2-093	N		1 U		0.2 U					
NR-2	04/07/2006	NR-2-095	N		1 U		0.2 UJ					
NR-2	05/03/2006	NR-2-098	N		1 U		0.2 U					
NR-2	06/16/2006	NR-2-102	N		1 U		0.2 U					
NR-2	07/13/2006	NR-2-104	N		1 U		0.2 U					
NR-2	08/08/2006	NR-2-106	N		1 U		0.2 U					
NR-2	09/06/2006	NR-2-108	N		1 U		0.2 U					
NR-2	10/04/2006	NR-2-110	N		1 U		0.2 U					
NR-2	11/15/2006	NR-2-113	N		1 U		0.2 U					
NR-2	12/20/2006	NR-2-115	N		1 U		0.2 U					
NR-2	01/22/2007	NR-2-118	N		1 U		0.2 U					
NR-2	03/14/2007	NR-2-121	N		1 U		0.2 U					
NR-2	05/09/2007	NR-2-125	N		1 U		0.2 U					
NR-2	09/12/2007	NR-2-134	N		1 U		0.2 U					
NR-2	09/14/2007	NR-2-134-R	N		1 U		0.2 U					
NR-2	09/26/2007	NR-2-135	N		1 U		0.2 U					
NR-2	10/03/2007	NR-2-136	N		1 U		0.2 U					
NR-3	02/17/2004	NR-3-014	N		1 U		0.2 U					
NR-3	03/16/2004	NR-3-018	N		1 U	10 U	0.2 UJ			20 U		287
NR-3	04/13/2004	NR-3-022	N		1 U		0.2 U					
NR-3	05/13/2004	NR-3-026	N		1 U		0.2 U					
NR-3	06/11/2004	NR-3-030	N		1 U	10.4 U	0.2 U			20 U		91.7 U
NR-3	07/15/2004	NR-3-035	N		1 U		0.2 U					
NR-3	08/10/2004	NR-3-039	N		1 U		0.2 U					
NR-3	09/23/2004	NR-3-043	N		1 U		0.2 U					
NR-3	10/19/2004	NR-3-045	N		1 U		0.2 U					
NR-3	11/15/2004	NR-3-047	N		1 U							
NR-3	12/13/2004	NR-3-049	N		1 U		0.2 U					
NR-3	01/10/2005	NR-3	N		1 U		0.2 U					
NR-3	02/08/2005	NR3-053	N		1 U		0.2 U					
NR-3	03/08/2005	NR-3-056	N		1 U		0.2 U					
NR-3	04/06/2005	NR-3-060	N		1 U		0.2 U					
NR-3	05/04/2005	NR-3-064	N		1 U		0.2 U					
NR-3	06/14/2005	NR-3-070	N		1 U		0.2 U					
NR-3	07/14/2005	NR-3-074	N		1 U		0.2 U					
NR-3	08/18/2005	NR-3-077	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
NR-3	09/07/2005	NR-3-079	N		1 U		0.2 U					
NR-3	10/05/2005	NR-3-081	N		1 U		0.2 U					
NR-3	11/01/2005	NR-3-083	N		1 U		0.2 U					
NR-3	12/15/2005	NR-3-087	N		1 U		0.2 U					
NR-3	01/10/2006	NR-3-089	N		1 U		0.2 U					
NR-3	02/07/2006	NR-3-091	N		1 U		0.2 U					
NR-3	03/06/2006	NR-3-093	N		1 U		0.2 U					
NR-3	04/07/2006	NR-3-095	N		1 U		0.2 UJ					
NR-3	05/03/2006	NR-3-098	N		1 U		0.2 U					
NR-3	06/16/2006	NR-3-102	N		1 U		0.2 U					
NR-3	07/13/2006	NR-3-104	N		1 U		0.2 U					
NR-3	08/08/2006	NR-3-106	N		1 U		0.2 U					
NR-3	09/06/2006	NR-3-108	N		1 U		0.2 U					
NR-3	10/04/2006	NR-3-110	N		1 U		0.2 U					
NR-3	11/15/2006	NR-3-113	N		1 U		0.2 U					
NR-3	12/20/2006	NR-3-115	N		1 U		0.2 U					
NR-3	01/22/2007	NR-3-118	N		1 U		0.2 U					
NR-3	03/14/2007	NR-3-121	N		1 U		0.2 U					
NR-3	05/09/2007	NR-3-125	N		1 U		0.2 U					
NR-3	09/12/2007	NR-3-134	N		1 U		0.2 U					
NR-3	09/14/2007	NR-3-134-R	N		1 U		0.2 U					
NR-3	09/26/2007	NR-3-135	N		1 U		0.2 U					
NR-3	10/03/2007	NR-3-136	N		1 U		0.2 U					
R-19	09/04/1998	19-R-A-0	N		20 U	10 U	10 U			25 U		5 U
R-19-B	09/04/1998	19-R-B-0	N		20 U	10 U	10 U			25 U		5 U
R-19-B	09/04/1998	19-R-B-5	N		20 U	10 U	10 U			25 U		5 U
R-19-B	09/04/1998	19-R-B-5D	FD		20 U	4.5 J	10 U			25 U		5 U
R-19-C	09/04/1998	19-R-C-0	N		20 U	10 U	10 U			25 U		5 U
R-19-C	09/04/1998	19-R-C-10	N		20 U	10 U	10 U			25 U		3.9 J
R-20	09/04/1998	20-R-A-0	N		20 U	10 U	10 U			25 U		5 U
R-20-B	09/04/1998	20-R-B-0	N		20 U	10 U	10 U			25 U		5 U
R-20-B	09/04/1998	20-R-B-5	N		20 U	10 U	10 U			25 U		4.2 J
R-20-B	09/04/1998	20-R-B-5D	FD		20 U	6.3 J	10 U			12 J		9.3
R-20-C	09/04/1998	20-R-C-0	N		20 U	10 U	10 U			25 U		5 U
R-20-C	09/04/1998	20-R-C-10	FD		20 U	10 U	10 U			25 U		3.6 J
R-22	07/19/1999	R-22_07/19/1999	N		20 U	6 J	10 U			25 U		13
R-22	09/04/1999	R-22_09/04/1999	N		20 U	10 U	10 U			25 U		5.3

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
R-22	12/01/1999	R-22_12/01/1999	N		20 U	4.7 J	10 U			25 U		5 U
R-22	03/25/2000	R-22_03/25/2000	N		20 U	4.1 J	10 U			2 J		10
R-22	06/15/2000	R-22_06/15/2000	N		20 U	3.9 J	10 U			5.3		10
R-22	09/01/2000	R-22_09/01/2000	N		20 U	1.9 J	10 U			1.9 J		18
R-22	12/15/2000	R-22_12/15/2000	N		20 U	5.4 J	10 U			1.7 J		5.7 J
R-22	03/28/2001	R-22_03/28/2001	N		20 U	10 U	10 U			1.1 J		10
R-22	06/05/2001	R-22_06/05/2001	N		20 U	10 U	10 U			25 U		5 U
R-22	08/25/2001	R-22_08/25/2001	N		20 U	10 U	10 U			2.3 J		35
R-22	09/13/2001	R-22_09/13/2001	N		20 U	5.4 J	10 U			1.1 J		11
R-22	11/29/2001	R-22_11/29/2001	N		20 U	2.1 J	10 U			2.4 J		16
R-22	03/05/2002	R-22-001_03/05/2002	N			8.7	10 U			5.7		53.6
R-22	06/11/2002	R-22-002_6/11/02	N		7.4	10 U				7		58.3
R-22	08/06/2002	R-22-RS_8/6/02	N		6.2		10 U					
R-22	09/18/2002	R-22-003	N		3.4	119	10 U			24.4		226
R-22	12/12/2002	R-22_12/12/02_LS	N		6.7	20 U	10 U			27.8 U		76.1
R-22	03/19/2003	R-22-005	N		12.5	11 U	10 U			27.8 U		159
R-22	06/10/2003	R-22-006	N		3 J	10 U	10 U			26.1 U		105
R-22	09/10/2003	R-22-007	N		1 U	68.1	0.2 U			26.1 U		116
R-22	12/08/2003	R-22-009	N		1 U	10 U	0.2 U			20 U		66.4
R-22	02/16/2004	R-22-014	N		1 U		0.2 U					
R-22	02/16/2004	R-93-014	FD		1 U		0.2 U					
R-22	03/15/2004	R-22-018	N		1.1	10 U	0.2 U			20 U		176
R-22	04/14/2004	R-22-022	N		4.3 U		0.2 U					
R-22	05/12/2004	R-22-026	N		1 U		0.2 U					
R-22	06/10/2004	R-22-030	N		1 U	10.4 U	0.2 U			20 U		23.1 U
R-22	07/15/2004	R-22-035	N		1 U		0.2 U					
R-22	08/10/2004	R-22-039	N		1 U		0.2 U					
R-22	09/23/2004	R-22-043	N		1 U		0.2 U					
R-22	10/19/2004	R-22-045	N		1 U		0.2 U					
R-22	11/15/2004	R-22-047	N		1 U							
R-22	12/13/2004	R-22-049	N		1 U		0.2 U					
R-22	01/10/2005	R-22	N		1 U		0.2 U					
R-22	02/08/2005	R-22-053	N		1 U		0.2 U					
R-22	02/24/2005	R-22-054	N		1 U		0.2 U					
R-22	03/01/2005	R-22-055	N		1 UJ		0.2 U					
R-22	03/07/2005	R-22-056	N		1 U		0.2 U					
R-22	03/14/2005	R-22-057	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
R-22	04/06/2005	R-22-060	N		1 U		0.2 U					
R-22	05/04/2005	R-22-064	N		1 U		0.2 U					
R-22	06/14/2005	R-22-070	N		1 U		0.2 U					
R-22	07/13/2005	R-22-074	N		1 U		0.2 U					
R-22	08/18/2005	R-22-077	N		1 U		0.2 U					
R-22	09/07/2005	R-22-079	N		1 U		0.2 U					
R-22	10/05/2005	R-22-081	N		1 U		0.2 U					
R-22	11/01/2005	R-22-083	N		1 U		0.2 U					
R-22	12/16/2005	R-22-087	N		1 U		0.2 U					
R-22	01/11/2006	R-22-089	N		1 U		0.2 U					
R-22	02/08/2006	R-22-091	N		1 U		0.2 U					
R-22	03/06/2006	R-22-093	N		1 U		0.2 U					
R-22	04/07/2006	R-22-095	N		1 U		0.2 U					
R-22	05/03/2006	R-22-098	N		1 U		0.2 U					
R-22	06/15/2006	R-22-102	N		1 U		0.2 U					
R-22	07/12/2006	R-22-104	N		1 U		0.2 U					
R-22	08/08/2006	R-22-106	N		1 U		0.2 U					
R-22	09/07/2006	R-22-108	N		1 U		0.2 U					
R-22	10/04/2006	R-22-110	N		1 U		1 U					
R-22	11/15/2006	R-22-113	N		1 U		0.2 U					
R-22	12/20/2006	R-22-115	N		1 U		0.2 U					
R-22	01/22/2007	R-22-118	N		1 U		0.2 U					
R-22	03/13/2007	R-22-121	N		1 U		0.2 U					
R-22	05/08/2007	R-22-125	N		1 U		0.2 U					
R-22	09/11/2007	R-22-134	N		1 U		0.2 U					
R-22	09/13/2007	R-22-134-R	N		1 U		0.2 U					
R-22	09/25/2007	R-22-135	N		1 U		0.2 U					
R-22	10/02/2007	R-22-136	N		1 U		0.2 U					
R-27	06/08/1999	R-27_06/08/1999	N		20 U	4.3 J	10 U			25 U		5 U
R-27	09/04/1999	R-27_09/04/1999	N		20 U	10 U	10 U			25 U		5.3
R-27	12/01/1999	R-27_12/01/1999	N		20 U	10 U	10 U			1.5 J		5 U
R-27	03/25/2000	R-27_03/25/2000	N		20 U	10 U	10 U			5		14
R-27	06/15/2000	R-27_06/15/2000	N		20 U	4.4 J	10 U			4.2 J		10
R-27	09/01/2000	R-27_09/01/2000	N		20 U	4.5 J	10 U			2.5 J		7.6 J
R-27	12/15/2000	R-27_12/15/2000	N		20 U	16	10 U			5 U		12
R-27	03/28/2001	R-27_03/28/2001	N		20 U	10 U	10 U			1.4 J		10
R-27	06/05/2001	R27_06/05/2001	N		20 U	10 U	10 U			2.6 J		5.9 J

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
R-27	08/25/2001	R27_08/25/2001	N		20 U	5.7 J	10 U			2.5 J		40
R-27	09/13/2001	R-27_09/13/2001	N		20 U	4.3 J	10 U			25 U		9 J
R-27	11/29/2001	R-27_11/29/2001	N		20 U	2.2 J	10 U			1 J		14
R-27	03/05/2002	R-27-001_03/05/2002	N			8.3	10 U			5.9		72.8
R-27	06/11/2002	R-27-002_6/11/02	N		14.3	10 U				5 U		28.4
R-27	08/06/2002	R-27-RS_8/6/02	N		5.3		10 U					
R-27	09/18/2002	R-27-003	N		3.8	20 U	10 U			5 U		343
R-27	12/12/2002	R-27_12/12/02_LS	N		7	20 U	10 U			27.8 U		135
R-27	03/19/2003	R-27-005	N		10.3	11 U	10 U			27.8 U		114
R-27	06/10/2003	R-27-006	N	500 U	2.6 J	10 U	10 U			26.1 U		174
R-27	09/10/2003	R-27-007	N		1 U	11 U	0.2 U			26.1 U		90.6
R-27	12/08/2003	R-27-009	N		1 U	10 U	0.2 U			20 U		34.3
R-27	02/16/2004	R-27-014	N		1 U		0.2 U					
R-27	03/03/2004	R-27-016	N		1 U		0.2 U					
R-27	03/15/2004	R-27-018	N		1 U	10 U	0.2 U			20 U		122 J
R-27	04/14/2004	R-27-022	N		1 U		0.2 U					
R-27	05/12/2004	R-27-026	N		1 U		0.2 U					
R-27	06/10/2004	R-27-030	N		1 U	10.4 U	0.2 U			20 U		22.2 U
R-27	07/15/2004	R-27-035	N		1 U		0.2 U					
R-27	08/10/2004	R-27-039	N		1 U		0.2 U					
R-27	09/22/2004	R-27-043	N		1 U		0.2 U					
R-27	10/19/2004	R-27-045	N		1 U		0.2 U					
R-27	11/15/2004	R-27-047	N		1 U							
R-27	12/13/2004	R-27-049	N		1 U		0.2 U					
R-27	01/10/2005	R-27	N		1 U		0.2 U					
R-27	02/08/2005	R-27-053	N		1 U		0.2 U					
R-27	02/24/2005	R-27-054	N		1 U		0.2 U					
R-27	03/01/2005	R-27-055	N		1 UJ		0.2 U					
R-27	03/07/2005	R-27-056	N		1 U		0.2 U					
R-27	03/14/2005	R-27-057	N		1 U		0.2 U					
R-27	04/06/2005	R-27-060	N		1 U		0.2 U					
R-27	05/04/2005	R-27-064	N		1 U		0.2 U					
R-27	06/14/2005	R-27-070	N		1 U		0.2 U					
R-27	07/13/2005	R-27-074	N		1 U		0.2 U					
R-27	08/18/2005	R-27-077	N		1 U		0.2 U					
R-27	09/07/2005	R-27-079	N		1 U		0.2 U					
R-27	10/05/2005	R-27-081	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
R-27	11/01/2005	R-27-083	N		1 U		0.2 U					
R-27	12/16/2005	R-27-087	N		1 U		0.2 U					
R-27	01/12/2006	R-27-089	N		1 U		0.2 U					
R-27	02/08/2006	R-27-091	N		1 U		0.2 U					
R-27	03/06/2006	R-27-093	N		1 U		0.2 U					
R-27	04/07/2006	R-27-095	N		1 U		0.2 UJ					
R-27	05/03/2006	R-27-098	N		1 U		0.2 U					
R-27	06/15/2006	R-27-102	N		1 U		0.2 U					
R-27	07/12/2006	R-27-104	N		1 U		0.2 UJ					
R-27	08/08/2006	R-27-106	N		1 U		0.2 U					
R-27	09/07/2006	R-27-108	N		1 U		0.2 U					
R-27	10/04/2006	R-27-110	N		1 U		0.2 U					
R-27	11/15/2006	R-27-113	N		1 U		0.2 U					
R-27	12/20/2006	R-27-115	N		1 U		0.2 U					
R-27	01/22/2007	R-27-118	N		1 U		0.2 U					
R-27	03/13/2007	R-27-121	N		1 U		0.2 U					
R-27	05/08/2007	R-27-125	N		1 U		1 U					
R-27	09/11/2007	R-27-134	N		1 U		0.2 U					
R-27	09/13/2007	R-27-134-R	N		1 U		0.2 U					
R-27	09/26/2007	R-27-135	N		1 U		0.2 U					
R-27	10/02/2007	R-27-136	N		1 U		0.2 U					
R-28	06/08/1999	R-28_06/08/1999	N		20 U	4.6 J	10 U			25 U		5 U
R-28	09/04/1999	R-28_09/04/1999	N		20 U	10 U	10 U			25 U		5.3
R-28	12/01/1999	R-28_12/01/1999	N		20 U	10 U	10 U			1.9 J		4.4 J
R-28	03/25/2000	R-28_03/25/2000	N		20 U	10 U	10 U			1.5 J		24
R-28	06/15/2000	R-28_06/15/2000	N		20 U	5.2 J	10 U			2.1 J		10
R-28	09/01/2000	R-28_09/01/2000	N		20 U	10 U	10 U			2 J		5.6 J
R-28	12/15/2000	R-28_12/15/2000	N		20 U	4 J	10 U			5 U		7.2 J
R-28	03/28/2001	R-28_03/28/2001	N		20 U	10 U	10 U			1.6 J		10
R-28	06/05/2001	R-28_06/05/2001	N		20 U	10 U	10 U			25 U		5 U
R-28	08/25/2001	R-28_08/25/2001	N		20 U	2.6 J	10 U			1.2 J		31
R-28	09/13/2001	R-28_09/13/2001	N		31	4.7 J	10 U			16		11
R-28	11/29/2001	R-28_11/29/2001	N		20 U	10 U	10 U			0.98 J		30
R-28	03/05/2002	R-28-001_03/05/2002	N			6.1	10 U			4.8		43.7
R-28	06/11/2002	R-28-002_6/11/02	N		6.6	10 U				7.6		106
R-28	08/06/2002	R-28-RS_8/6/02	N		3.5		10 U		5.4		253	
R-28	09/18/2002	R-28-003	N		18.7	20 U	10 U			30		1060

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
R-28	12/12/2002	R-28_12/12/02_LS	N		7.2	20 U	10 U			27.8 U		110
R-28	03/20/2003	R-28-005	N		14.6	11 U	10 U			27.8 U		324
R-28	06/10/2003	R-28-006	N	500 U	5.5	10 U	10 U			26.1 U		174
R-28	09/10/2003	R-28-007	N		1 U	11 U	0.2 U			26.1 U		26.1 U
R-28	12/08/2003	R-28-009	N		1 U	10 U	0.2 U			20 U		30.9
R-28	02/16/2004	R-28-014	N		1 U		0.2 U					
R-28	03/03/2004	R-28-016	N		1 U		0.2 U					
R-28	03/15/2004	R-28-018	N		1 U	10 U	0.2 U			20 U		104 J
R-28	04/14/2004	MW-90-022	FD		1.23 U		0.2 U					
R-28	04/14/2004	R-28-022	N		1.1 U		0.2 U					
R-28	05/12/2004	R-28-026	N		1 U		0.2 U					
R-28	06/10/2004	R-28-030	N		1 U	10.4 U	0.2 U			20 U		25.1 U
R-28	07/15/2004	R-28-035	N		1 U		0.2 U					
R-28	08/10/2004	R-28-039	N		1 U		0.2 U					
R-28	09/22/2004	R-28-043	N		1 U		0.2 U					
R-28	10/19/2004	R-28-045	N		1 U		0.2 U					
R-28	11/15/2004	R-28-047	N		1 U							
R-28	12/13/2004	R-28-049	N		1 U		0.2 U					
R-28	01/10/2005	R-28	N		1 U		0.2 U					
R-28	02/08/2005	R-28-053	N		1 U		0.2 U					
R-28	03/08/2005	R-28-056	N		1 U		0.2 U					
R-28	04/06/2005	R-28-060	N		1 U		0.2 U					
R-28	05/04/2005	R-28-064	N		1 U		0.2 U					
R-28	06/14/2005	R-28-070	N		1 U		0.2 U					
R-28	07/14/2005	R-28-074	N		1 U		0.2 U					
R-28	08/18/2005	R-28-077	N		1 U		0.2 U					
R-28	09/07/2005	R-28-079	N		1 U		0.2 U					
R-28	10/05/2005	R-28-081	N		1 U		0.2 UJ					
R-28	11/01/2005	R-28-083	N		1 U		0.2 U					
R-28	12/16/2005	R-28-087	N		1 U		0.2 U					
R-28	01/10/2006	R-28-089	N		1 U		0.2 U					
R-28	02/08/2006	R-28-091	N		1 U		0.2 U					
R-28	03/06/2006	R-28-093	N		1 U		0.2 U					
R-28	04/07/2006	R-28-095	N		1 U		0.2 UJ					
R-28	05/03/2006	R-28-098	N		1 U		0.2 U					
R-28	06/15/2006	R-28-102	N		1 U		0.2 U					
R-28	07/13/2006	R-28-104	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
R-28	08/08/2006	R-28-106	N		1 U		0.2 U					
R-28	09/07/2006	R-28-108	N		1 U		0.2 U					
R-28	10/04/2006	R-28-110	N		1 U		0.2 U					
R-28	11/15/2006	R-28-113	N		1 U		0.2 U					
R-28	12/20/2006	R-28-115	N		1 U		0.2 U					
R-28	01/22/2007	R-28-118	N		1 U		0.2 U					
R-28	03/14/2007	R-28-121	N		1 U		0.2 U					
R-28	05/09/2007	R-28-125	N		1 U		0.2 U					
R-28	09/12/2007	R-28-134	N		1 U		0.2 U					
R-28	09/13/2007	R-28-134-R	N		1 U		0.2 U					
R-28	09/26/2007	R-28-135	N		1 U		0.2 U					
R-28	10/03/2007	R-28-136	N		1 U		0.2 U					
RRB	07/01/1997	RRB_07/01/1997	N	120	20 U	7.6 J	10 U	2 J	7	15 J	10 U	23
RRB	09/01/1997	RRB_09/01/1997	N		20 U	10 U	10 U			25 U		6
RRB	02/18/1998	RRB_02/18/1998	N		20 U	10 U	10 U			25 U		5 U
RRB	06/19/1998	RRB_06/19/1998	N		20 U	6.8 J	10 U			25 U		16 J
RRB	12/01/1999	RRB_12/01/1999	N		20 U	10 U	10 U			25 U		5 U
RRB	06/15/2000	Vernal Pool_06/15/2000	N		20 U	5.2 J	10 U			5		10
RRB	09/01/2000	Vernal Pool_09/01/2000	N		20 U	8.7 J	10 U			0.94 J		3.9 J
RRB	12/15/2000	Vernal Pool_12/15/2000	N		20 U	3.9 J	10 U			5		8.8 J
RRB	03/28/2001	Vernal Pool_03/28/2001	N		20 U	10 U	10 U			3.1 J		9.5 J
RRB	06/05/2001	Vernal Pool_06/05/2001	N		20 U	10 U	10 U			2.7 J		5.9 J
RRB	08/25/2001	Vernal Pool_08/25/2001	N		20 U	10 U	10 U			1.9 J		29
RRB	09/13/2001	Vernal Pool_09/13/2001	N		20 U	5.7 J	10 U			1.5 J		15
RRB	03/05/2002	VERNAL POOL-001_03/05/2	N			4.7	10 U			6.2		22.5
RRB	06/11/2002	VERNAL POOL-002_6/11/02	N		6.3	10 U				7.4		51.9
RRB	08/06/2002	VERNAL POOL-RS_8/6/02	N		3.9		10 U					
RRB	09/18/2002	RBB-003	N		17.9	20 U	10 U			21.6		1060
RRB	12/12/2002	RRB_12/12/02_LS	N		14.1	20 U	10 U			27.8 U		172
RRB	03/20/2003	VERNAL POOL-005	N		13	11 U	10 U			27.8 U		334
RRB	06/11/2003	RRB-006	N		4.4 J	10 U	10 U			26.1 U		126
RRB	09/08/2003	RRB-007	N		1 U	11 U	0.2 U			26.1 U		178
RRB	12/08/2003	RRB-009	N		1 U	10 U	0.2 U			20 U		33.1
RRB	02/16/2004	RRB-014	N		1 U		0.2 U					
RRB	03/15/2004	RRB-018	N		1.6	10 U	0.2 U			20 U		116 J
RRB	04/13/2004	RRB-022	N		1.1		0.2 U					
RRB	05/13/2004	RRB-026	N		1 U		0.2 U					

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
RRB	06/10/2004	RRB-030	N		1 U	10.4 U	0.2 U			20 U		21.9 U
RRB	07/15/2004	RRB-035	N		1 U		0.2 U					
RRB	08/10/2004	RRB-039	N		1 U		0.2 U					
RRB	09/23/2004	RRB-043	N		1 U		0.2 U					
RRB	10/19/2004	RRB-045	N		1 U		0.2 U					
RRB	11/15/2004	RRB-047	N		1 U							
RRB	12/13/2004	RRB-049	N		1 U		0.2 U					
RRB	02/08/2005	RRB-053	N		1 U		0.2 U					
RRB	04/07/2005	RRB-060	N		1 U		0.2 U					
RRB	05/04/2005	RRB-064	N		1 U		0.2 U					
RRB	06/14/2005	RRB-070	N		1 U		0.2 U					
RRB	07/14/2005	RRB-074	N		1 U		0.2 U					
RRB	08/18/2005	RRB-077	N		1 U		0.2 U					
RRB	09/07/2005	RRB-079	N		1 U		0.2 U					
RRB	10/05/2005	RRB-081	N		1 U		0.2 U					
RRB	11/01/2005	RRB-083	N		1 U		0.2 U					
RRB	02/08/2006	RRB-091	N		1 U		0.2 U					
RRB	03/06/2006	RRB-093	N		1 U		0.2 U					
RRB	04/07/2006	RRB-095	N		1 U		0.2 U					
RRB	05/03/2006	RRB-098	N		1 U		0.2 U					
RRB	06/16/2006	RRB-102	N		1 U		0.2 U					
RRB	07/12/2006	RRB-104	N		1 U		0.2 UJ					
RRB	08/10/2006	RRB-106	N		1 U		0.2 U					
RRB	09/06/2006	RRB-108	N		1 U		0.2 U					
RRB	10/04/2006	RRB-110	N		1 U		0.2 U					
RRB	11/15/2006	RRB-113	N		1 U		0.2 U					
RRB	12/20/2006	RRB-115	N		1 U		1 U					
RRB	01/22/2007	RRB-118	N		1 U		0.2 U					
RRB	03/14/2007	RRB-121	N		1 U		0.2 U					
RRB	05/09/2007	RRB-125	N		1 U		0.2 U					
RRB	09/12/2007	RRB-134	N		1 U		0.2 U					
RRB	09/14/2007	RRB-134-R	N		1 U		0.2 U					
RRB	09/26/2007	RRB-135	N		1 U		0.2 U					
RRB	10/03/2007	RRB-136	N		1 U		0.2 U					
Seasonal Wetlands	07/01/1997	Vernal Pool_07/01/1997	N	120	20 U	7.2 J	10 U	2.6 J	5	25 U	10 U	6
Seasonal Wetlands	09/01/1997	Vernal Pool_09/01/1997	N		20 U	5.8 J	10 U			25 U		4 J
Seasonal Wetlands	02/18/1998	Vernal Pool_02/18/1998	N		20 U	10 U	10 U			25 U		5 U

Table B-1a. Surface Water Data Summary – Background Metals

Well	Date	Sample ID	Sample Type	Barium	Chromium, total	Copper	Chromium, hexavalent	Lead	Molybdenum	Nickel	Vanadium	Zinc
Seasonal Wetlands	06/19/1998	Vernal Pool_06/19/1998	N		20 U	4.7 J	10 U			25 U		22 J
Seasonal Wetlands	06/08/1999	Vernal Pool_06/08/1999	N		200 U	100 U	10 U			250 U		53 U
Seasonal Wetlands	09/01/1999	Vernal Pool_09/01/1999	N		20 U	7.8 J	10 U			25 U		5.3
Seasonal Wetlands	12/01/1999	Vernal Pool_12/01/1999	N		20 U	5.9 J	10 U			1.4 J		5 U
Seasonal Wetlands	03/25/2000	Vernal Pool_03/25/2000	N		20 U	10 U	10 U			1.8 J		11
SW-10B	01/05/2006	SW-10B-002	N		1 U		0.2 U					
SW-10B	01/05/2006	SW-111B-002	FD		1 U		0.2 U					
SW-11B	01/05/2006	SW-11B-002	N		1 U		0.2 U					
SW-12B	01/06/2006	SW-12B-002	N		1 U		0.2 U					
SW-13B	01/06/2006	SW-13B-002	N		1 U		0.2 U					
SW-14B	01/07/2006	SW-14B-002	N		1 U		0.2 U					
SW-15B	01/07/2006	SW-15B-002	N		1 U		0.2 U					
SW-16B	01/07/2006	SW-16B-002	N		1 U		0.2 U					
SW-1B	01/04/2006	SW-01B-002	N		1 U		0.2 U					
SW-2B	01/04/2006	SW-02B-002	N		1 U		0.2 U					
SW-3B	01/05/2006	SW-03B-002	N		1 U		0.2 U					
SW-4B	01/05/2006	SW-04B-002	N		1 U		0.2 U					
SW-5B	01/06/2006	SW-05B-002	N		1 U		0.2 U					
SW-5B	01/06/2006	SW-105B-002	FD		1 U		0.2 U					
SW-6B	01/06/2006	SW-06B-002	N		1 U		0.2 U					
SW-7B	01/06/2006	SW-07B-002	N		1 U		0.2 U					
SW-8B	01/07/2006	SW-08B-002	N		1 U		0.2 U					
SW-9B	01/04/2006	SW-09B-002	N		1 U		0.2 U					

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L).

(2) Sample types are as follows:
N = Primary sample; and
FD = Field duplicate sample.

(3) Data qualifiers are as follows:
UJ = Estimated non detect;
U = Not detected; and
J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

Table B-1b. Surface Water Data Summary – Essential Nutrients

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
A-Dock	07/01/1997	A dock_07/01/1997	N	130	0.06	69000	81	0.3		27000	5 U	0.04516		4200	92000	240	0.02 U
C-I-3	03/13/2007	C-I-3-D-121	N	130								0.538					
C-I-3	03/13/2007	C-I-3-M-121	N	125								0.536					
C-I-3	03/13/2007	C-I-3-S-121	N	110								0.54					
C-MAR	03/13/2007	C-MAR-D-121	N	130								0.5 U					
C-MAR	03/13/2007	C-MAR-S-121	N	120								0.5 U					
CON	07/01/1997	CON_07/01/1997	N	128	0.2	68700	82	0.34		26200	5 U	0.2258		4300	92100	215	0.2 U
CON	09/01/2000	CON_09/01/2000	N	130	0.1 J	70100	72	0.4		26100	2 J	0.4516		4700	83700	252	0.2 UJ
CON	11/29/2001	CON_11/29/2001	N	132	0.2 U	70100	72	0.3		26100	5.5	0.27096		4700	80800	247	0.2 U
CON	06/11/2003	CON-006	N	167	0.5 U	77000	79.7	0.37	500 U	27900	500 U	0.37	4 U	5540	86100	234	
C-R22	03/13/2007	C-R22-D-121	N	130								0.535					
C-R22	03/13/2007	C-R22-M-121	N	130								0.537					
C-R22	03/13/2007	C-R22-S-121	N	125								0.541					
C-R27	03/13/2007	C-R27-D-121	N	130								0.539					
C-R27	03/13/2007	C-R27-M-121	N	120								0.53					
C-R27	03/13/2007	C-R27-S-121	N	125								0.533					
C-TAZ	03/13/2007	C-TAZ-D-121	N	133								0.532					
C-TAZ	03/13/2007	C-TAZ-M-121	N	115								0.536					
C-TAZ	03/13/2007	C-TAZ-S-121	N	130								0.538					
I-3	07/01/1997	I3_07/01/1997	N	130	0.3	65700	81	0.34		24700	7	0.176124		4100	79300	242	0.2 U
I-3	07/01/1997	I3_07/01/1997_LFS	N	130	0.05 U	66000	84	0.3		26000	5 U	0.04516		4100	90000	240	0.02 U
I-3	09/01/2000	I-3_09/01/2000	N	148	0.1 J	72100	74	0.34		25200	3.6 J	0.5 J		4800	88900	234	0.2 UJ
I-3	11/29/2001	I-3_11/29/2001	N	132	0.2 U	69500	78.1	0.34		26100	4.9 J	0.89 J		4800	80500	221	0.2 U
I-3	06/10/2003	I-3-006	N	167	0.5 U	75200	78.8	0.34	500 U	28000	500 U	0.36	4 U	5890	114000	222	
I-3	06/10/2004	I-3-030	N	140	0.1 U	98800	83	0.3	500 U	27600	10 U	0.4 U		4080	93900	240	1.3
NR-1	06/11/2004	NR-1-030	N	140	0.1 U	92700	84	0.3	500 U	27500	10 U	0.4 U		4210	126000	240	0.4 U
R-27	06/10/2003	R-27-006	N	167	0.5 U	71700	80.7	0.35	500 U	26800	500 U	0.35		5310	88500	222	
R-27	03/03/2004	R-27-016	N	140		77000	87			28000		0.4 U		4400	94000	250	
R-27	05/12/2004	R-27-026	N	140		74000	84			27000		0.4 U		4800	96000	240	
R-27	06/10/2004	R-27-030	N		0.1 U												0.4 U
R-27	09/22/2004	R-27-043	N	130		77000	88.4			29000		0.38		4800	99000	237	

Table B-1b. Surface Water Data Summary – Essential Nutrients

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
R-27	12/13/2004	R-27-049	N	125		79600	84.4	0.5 U		31400				4950	86500	235	
R-27	03/07/2005	R-27-056	N	136		82800	92.7			31300		0.5 U		4720	108000	244	
R-27	06/14/2005	R-27-070	N	127	0.5 U	81900	90.9	0.5 U	500 U	29800	500 U	0.5 U		6040	98900	266	
R-27	10/05/2005	R-27-081	N	130	0.5 U	101000	85.1			36200		0.5 U		6560	91200	255	
R-27	12/16/2005	R-27-087	N	126		85500	87.9			29500		0.5 U		5990	75600	253	
R-27	03/06/2006	R-27-093	N	144	0.5 U	83500	90.6		500 U	29400	500 U	0.5 U		5440 J	101000	268	
R-27	05/03/2006	R-27-098	N	139		87000	93.1			31100		0.5 U		3120 J	106000	267	
R-27	10/04/2006	R-27-110	N	128		82900	91.5			31500		0.5 U		6240 J	98100	261	
R-27	12/20/2006	R-27-115	N	138		83200	94.5			30900		0.5 U		3640	106000	266	
R-27	03/13/2007	R-27-121	N	130		86900	96.5			31300		0.537		4730	106000	267	
R-27	05/08/2007	R-27-125	N	143		84300	92.6			29800		0.5 U		5550	100000	269	
R-27	09/11/2007	R-27-134	N			74200	89.4			28900		0.336		5470	86500	253	
R-28	06/10/2003	R-28-006	N	167	0.5 U	77800	80.2	0.38	500 U	28600	500 U	0.35		5820	95700	223	
R-28	03/03/2004	R-28-016	N	140		78000	87			28000		0.5		4400	93000	250	
R-28	05/12/2004	R-28-026	N	140		72000	84			26000		0.4 U		4200	92000	240	
R-28	06/10/2004	R-28-030	N		0.1 U												0.4 U
R-28	09/22/2004	R-28-043	N	130		79000	104			30000		0.38		4900	99000	240	
R-28	12/13/2004	R-28-049	N	133		79900	84.8	0.5 U		31500				4930	86000	236	
R-28	03/08/2005	R-28-056	N	132		83700	90.4			31400		12.5 U		5020	107000	231	
R-28	06/14/2005	R-28-070	N	127	0.5 U	78500	91.2	0.5 U	500 U	28500	500 U	0.5 U		5080	94500	268	
R-28	10/05/2005	R-28-081	N	122	0.5 U	85700	85.5			30400		0.5 U		6300	77000	255	
R-28	12/16/2005	R-28-087	N	126		87200	88.1			29800		0.5 U		6110	76800	254	
R-28	03/06/2006	R-28-093	N	146	0.5 U	76600	91		500 U	26600	500 U	0.5 U		5220 J	91500	270	
R-28	05/03/2006	R-28-098	N	136		88100	93.4			31400		0.5 U		4040 J	107000	270	
R-28	10/04/2006	R-28-110	N	133		84200	90.9			32100		0.5 U		6170 J	96500	259	
R-28	12/20/2006	R-28-115	N	138		85700	93.3			32000		0.5 U		4660	108000	262	
R-28	03/14/2007	R-28-121	N	133		87900	96.7			31000		0.534		5710	105000	268	
R-28	05/09/2007	R-28-125	N	143		86100	95.8			30500		0.5 U		5920	103000	271	
R-28	09/12/2007	R-28-134	N			73800	106			29900		0.372		6360	89200	296	

Table B-1b. Surface Water Data Summary – Essential Nutrients

Well	Date	Sample ID	Sample Type	Alkalinity, bicarb as CaCO3 (mg/L)	Ammonia as nitrogen (mg/L)	Calcium (µg/L)	Chloride (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Nitrate as nitrogen (mg/L)	Perchlorate (µg/L)	Potassium (µg/L)	Sodium (µg/L)	Sulfate (mg/L)	Sulfide (mg/L)
RRB	07/01/1997	RRB_07/01/1997	N	130	0.2	72600	78	0.39		27600	5	0.29354		4600	95900	220	0.2 U
Seasonal Wetland	07/01/1997	Vernal Pool_07/01/1997	N	150	0.3	70100	83	0.26		26700	8	0.31612		4700	95800	225	0.2 U

Notes:

(1) Concentrations are reported in micrograms per liter (µg/L) and milligrams per liter (mg/L).

(2) Sample types are as follows:

N = Primary sample; and

(3) Data qualifiers are as follows:

UJ = Estimated non detect;

U = Not detected; and

J = Estimated.

(4) A blank entry indicates the associated chemical was not sampled-for in the associated well.

(5) Sample results for ammonia and ammonia as nitrogen are combined.

(6) Sample results for nitrate as $NO3^-$ and nitrate as nitrogen are combined.

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Appendix C

Surface Water Data Summary – Metropolitan Water District of Southern California

Table C-1. Surface Water Data Summary – Metropolitan Water District of Southern California – Total Chromium and Hexavalent Chromium

Surface Water Sampling Location	Depth Below Water Surface (ft)	Sample Date	Hexavalent Chromium (dissolved) (µg/L)	Total Chromium (unfiltered) (µg/L)
CR Above Railroad	1	07/07/2003	ND (<0.03)	NC
CR Above Railroad	1	08/04/2003	0.04	NC
CR Above Railroad	1	09/09/2003	0.03	NC
CR Above Railroad	1	10/06/2003	ND (<0.03)	NC
CR Above Railroad	1	11/03/2003	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	12/11/2003	0.04	ND (<1.0)
CR Above Railroad	1	02/10/2004	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	03/10/2004	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	04/05/2004	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	05/03/2004	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	06/07/2004	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	07/07/2004	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	08/03/2004	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	09/08/2004	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	10/05/2004	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	11/02/2004	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	12/07/2004	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	03/08/2005	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	04/12/2005	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	05/10/2005	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	06/14/2005	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	07/12/2005	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	08/09/2005	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	09/13/2005	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	10/11/2005	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	11/08/2005	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	12/13/2005	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	01/10/2006	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	02/14/2006	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	03/14/2006	ND (<0.03)	ND (<1.0)

Table C-1. Surface Water Data Summary – Metropolitan Water District of Southern California – Total Chromium and Hexavalent Chromium

Surface Water Sampling Location	Depth Below Water Surface (ft)	Sample Date	Hexavalent Chromium (dissolved) (µg/L)	Total Chromium (unfiltered) (µg/L)
CR Above Railroad	1	04/11/2006	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	05/09/2006	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	06/13/2006	0.03	ND (<1.0)
CR Above Railroad	1	07/11/2006	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	08/08/2006	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	09/12/2006	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	10/10/2006	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	11/14/2006	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	12/12/2006	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	01/09/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	02/13/2007	0.03	ND (<1.0)
CR Above Railroad	1	03/05/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	03/13/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	04/10/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	05/08/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	06/12/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	07/10/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	08/14/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	09/11/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	10/09/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	11/14/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	12/11/2007	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	01/08/2008	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	02/12/2008	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	03/26/2008	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	04/08/2008	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	05/20/2008	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	06/10/2008	ND (<0.03)	ND (<1.0)
CR Above Railroad	1	07/08/2008	ND (<0.03)	ND (<1.0)
CR Down River	1	07/07/2003	NC	NC

Table C-1. Surface Water Data Summary – Metropolitan Water District of Southern California – Total Chromium and Hexavalent Chromium

Surface Water Sampling Location	Depth Below Water Surface (ft)	Sample Date	Hexavalent Chromium (dissolved) (µg/L)	Total Chromium (unfiltered) (µg/L)
CR Down River	1	08/04/2003	NC	NC
CR Down River	1	09/09/2003	NC	NC
CR Down River	1	10/06/2003	ND (<0.03)	NC
CR Down River	1	11/03/2003	ND (<0.03)	ND (<1.0)
CR Down River	1	12/11/2003	ND (<0.03)	ND (<1.0)
CR Down River	1	02/10/2004	ND (<0.03)	ND (<1.0)
CR Down River	1	03/10/2004	ND (<0.03)	ND (<1.0)
CR Down River	1	04/05/2004	ND (<0.03)	ND (<1.0)
CR Down River	1	05/03/2004	ND (<0.03)	ND (<1.0)
CR Down River	1	06/07/2004	ND (<0.03)	ND (<1.0)
CR Down River	1	07/07/2004	ND (<0.03)	ND (<1.0)
CR Down River	1	08/03/2004	ND (<0.03)	ND (<1.0)
CR Down River	1	09/08/2004	ND (<0.03)	ND (<1.0)
CR Down River	1	10/05/2004	ND (<0.03)	ND (<1.0)
CR Down River	1	11/02/2004	ND (<0.03)	ND (<1.0)
CR Down River	1	12/07/2004	ND (<0.03)	ND (<1.0)
CR Down River	1	03/08/2005	ND (<0.03)	ND (<1.0)
CR Down River	1	04/12/2005	ND (<0.03)	ND (<1.0)
CR Down River	1	05/10/2005	ND (<0.03)	ND (<1.0)
CR Down River	1	06/14/2005	ND (<0.03)	ND (<1.0)
CR Down River	1	07/12/2005	ND (<0.03)	ND (<1.0)
CR Down River	1	08/09/2005	ND (<0.03)	ND (<1.0)
CR Down River	1	09/13/2005	ND (<0.03)	ND (<1.0)
CR Down River	1	10/11/2005	ND (<0.03)	ND (<1.0)
CR Down River	1	11/08/2005	ND (<0.03)	ND (<1.0)
CR Down River	1	12/13/2005	ND (<0.03)	ND (<1.0)
CR Down River	1	01/10/2006	ND (<0.03)	ND (<1.0)
CR Down River	1	02/14/2006	ND (<0.03)	ND (<1.0)
CR Down River	1	03/14/2006	ND (<0.03)	ND (<1.0)
CR Down River	1	04/11/2006	0.03	ND (<1.0)

Table C-1. Surface Water Data Summary – Metropolitan Water District of Southern California – Total Chromium and Hexavalent Chromium

Surface Water Sampling Location	Depth Below Water Surface (ft)	Sample Date	Hexavalent Chromium (dissolved) (µg/L)	Total Chromium (unfiltered) (µg/L)
CR Down River	1	05/09/2006	ND (<0.03)	ND (<1.0)
CR Down River	1	06/13/2006	ND (<0.03)	ND (<1.0)
CR Down River	1	07/11/2006	ND (<0.03)	ND (<1.0)
CR Down River	1	08/08/2006	0.03	ND (<1.0)
CR Down River	1	09/12/2006	ND (<0.03)	ND (<1.0)
CR Down River	1	10/10/2006	ND (<0.03)	ND (<1.0)
CR Down River	1	11/14/2006	ND (<0.03)	ND (<1.0)
CR Down River	1	12/12/2006	ND (<0.03)	ND (<1.0)
CR Down River	1	01/09/2007	0.04	ND (<1.0)
CR Down River	1	02/13/2007	0.03	ND (<1.0)
CR Down River	1	03/05/2007	ND (<0.03)	ND (<1.0)
CR Down River	15	03/05/2007	ND (<0.03)	NC
CR Down River	1	03/13/2007	ND (<0.03)	ND (<1.0)
CR Down River	1	04/10/2007	ND (<0.03)	ND (<1.0)
CR Down River	1	05/08/2007	ND (<0.03)	ND (<1.0)
CR Down River	1	06/12/2007	ND (<0.03)	ND (<1.0)
CR Down River	1	07/10/2007	ND (<0.03)	ND (<1.0)
CR Down River	1	08/14/2007	ND (<0.03)	ND (<1.0)
CR Down River	1	09/11/2007	ND (<0.03)	ND (<1.0)
CR Down River	1	10/09/2007	ND (<0.03)	ND (<1.0)
CR Down River	1	11/14/2007	ND (<0.03)	ND (<1.0)
CR Down River	1	12/11/2007	ND (<0.03)	ND (<1.0)
CR Down River	1	01/08/2008	ND (<0.03)	ND (<1.0)
CR Down River	1	02/12/2008	ND (<0.03)	ND (<1.0)
CR Down River	1	03/26/2008	ND (<0.03)	ND (<1.0)
CR Down River	1	04/08/2008	0.06	ND (<1.0)
CR Down River	1	05/20/2008	ND (<0.03)	ND (<1.0)
CR Down River	1	06/10/2008	ND (<0.03)	ND (<1.0)
CR Down River	1	07/08/2008	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	07/07/2003	ND (<0.03)	NC

Table C-1. Surface Water Data Summary – Metropolitan Water District of Southern California – Total Chromium and Hexavalent Chromium

Surface Water Sampling Location	Depth Below Water Surface (ft)	Sample Date	Hexavalent Chromium (dissolved) (µg/L)	Total Chromium (unfiltered) (µg/L)
CR Near Park Moabi	1	08/04/2003	ND (<0.03)	NC
CR Near Park Moabi	1	09/09/2003	0.04	NC
CR Near Park Moabi	1	10/06/2003	0.03	NC
CR Near Park Moabi	1	11/03/2003	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	12/11/2003	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	02/10/2004	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	03/10/2004	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	04/05/2004	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	05/03/2004	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	06/07/2004	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	07/07/2004	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	08/03/2004	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	09/08/2004	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	10/05/2004	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	11/02/2004	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	12/07/2004	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	03/08/2005	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	04/12/2005	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	05/10/2005	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	06/14/2005	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	07/12/2005	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	08/09/2005	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	09/13/2005	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	10/11/2005	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	11/08/2005	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	12/13/2005	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	01/10/2006	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	02/14/2006	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	03/14/2006	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	04/11/2006	ND (<0.03)	ND (<1.0)

Table C-1. Surface Water Data Summary – Metropolitan Water District of Southern California – Total Chromium and Hexavalent Chromium

Surface Water Sampling Location	Depth Below Water Surface (ft)	Sample Date	Hexavalent Chromium (dissolved) (µg/L)	Total Chromium (unfiltered) (µg/L)
CR Near Park Moabi	1	05/09/2006	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	06/13/2006	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	07/11/2006	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	08/08/2006	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	09/12/2006	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	10/10/2006	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	11/14/2006	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	12/12/2006	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	01/09/2007	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	02/13/2007	0.03	ND (<1.0)
CR Near Park Moabi	1	03/05/2007	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	6	03/05/2007	ND (<0.03)	NC
CR Near Park Moabi	1	03/13/2007	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	04/10/2007	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	05/08/2007	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	06/12/2007	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	07/10/2007	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	08/14/2007	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	09/11/2007	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	10/09/2007	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	11/14/2007	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	12/11/2007	0.03	ND (<1.0)
CR Near Park Moabi	1	01/08/2008	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	02/12/2008	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	03/26/2008	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	04/08/2008	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	05/20/2008	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	06/10/2008	ND (<0.03)	ND (<1.0)
CR Near Park Moabi	1	07/08/2008	ND (<0.03)	ND (<1.0)
CR Bat Cave Wash	6	10/09/2007	ND (<0.03)	ND (<1.0)

Table C-1. Surface Water Data Summary – Metropolitan Water District of Southern California – Total Chromium and Hexavalent Chromium

Surface Water Sampling Location	Depth Below Water Surface (ft)	Sample Date	Hexavalent Chromium (dissolved) (µg/L)	Total Chromium (unfiltered) (µg/L)
CR Bat Cave Wash	10	02/12/2008	ND (<0.03)	ND (<1.0)
CR Bat Cave Wash	3	08/12/2008	ND (<0.03)	ND (<1.0)

Notes:

(1) Samples collected by the Metropolitan Water District of Southern California

(2) Analysis conducted at Metropolitan's Water Quality Laboratory. Hexavalent chromium analyzed by USEPA Method 218.6, total chromium analyzed by USEPA method 200.8.

ft - foot/feet
NC = not collected
ND = not detected
µg/L = micrograms per liter

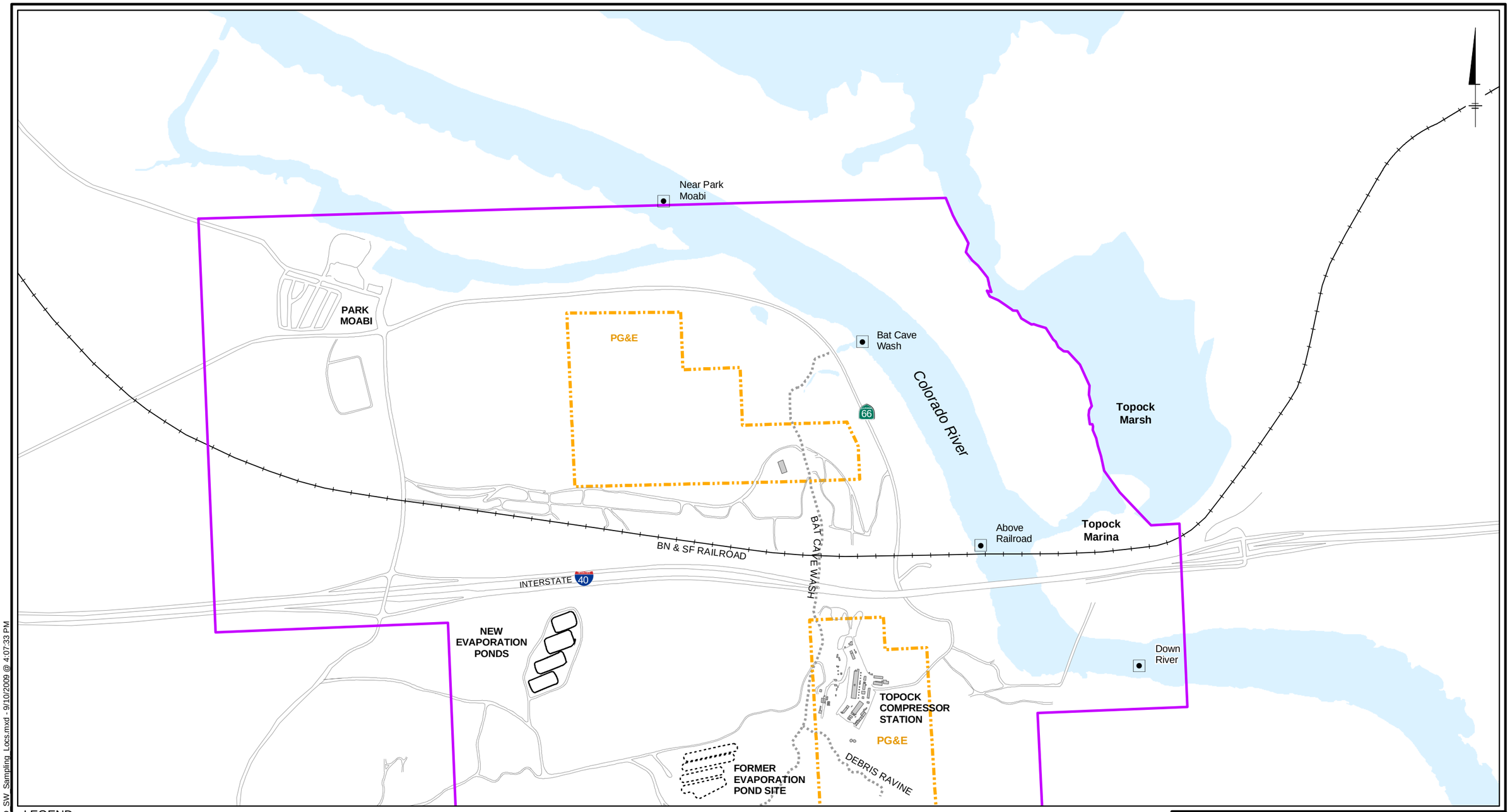
Table C-2. Surface Water Data Summary – Metropolitan Water District of Southern California – Other Chemicals

Surface Water Sampling Location	Depth Below Water Surface (ft)	Sample Date	Aluminum (µg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Boron (µg/L)	Cadmium (µg/L)	Copper (µg/L)	Lead (µg/L)	Lithium (µg/L)	Manganese (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Strontium (µg/L)	Titanium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
CR Above Railroad	1	11/03/2003	15	ND (<2)	2.4	129	ND (<0.5)	NA	ND (<0.1)	ND (<10)	ND (<1)	46	ND (<5)	5	3	ND (<5)	ND (<5)	1056	ND (<1)	2.2	ND (<20)
CR Above Railroad	1	12/11/2003	ND (<10)	ND (<2)	2.6	137	ND (<0.5)	NA	ND (<0.1)	ND (<10)	ND (<1)	41	ND (<5)	5	3	ND (<5)	ND (<5)	1081	ND (<1)	NA	ND (<20)
CR Above Railroad	1	07/10/2007	470	ND (<2)	2.7	154	ND (<0.5)	170	ND (<0.1)	ND (<10)	ND (<1)	54	ND (<5)	6	3	ND (<5)	ND (<5)	1160	ND (<1)	2.5	ND (<20)
CR Above Railroad	1	08/14/2007	88	ND (<2)	2.9	168	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	51	ND (<5)	6	3	ND (<5)	ND (<5)	1210	ND (<1)	2.4	ND (<20)
CR Above Railroad	1	09/11/2007	16	ND (<2)	3	143	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	49	ND (<5)	6	4	ND (<5)	ND (<5)	1160	ND (<1)	2.4	ND (<20)
CR Above Railroad	1	10/09/2007	43	ND (<2)	2.8	156	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	54	ND (<5)	6	5	ND (<5)	ND (<5)	1230	ND (<1)	2.5	ND (<20)
CR Above Railroad	1	11/14/2007	17	ND (<2)	2.7	160	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	55	ND (<5)	6	3	ND (<5)	ND (<5)	1210	ND (<1)	2.6	ND (<20)
CR Above Railroad	1	12/11/2007	12	ND (<2)	2.7	147	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	48	5	6	5	ND (<5)	ND (<5)	1240	ND (<1)	2.2	ND (<20)
CR Above Railroad	1	01/08/2008	25	ND (<2)	2.7	147	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	49	ND (<5)	6	4	ND (<5)	ND (<5)	1220	ND (<1)	2.5	ND (<20)
CR Above Railroad	1	02/12/2008	43	ND (<2)	2.8	150	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	49	ND (<5)	6	4	ND (<5)	ND (<5)	1250	ND (<1)	2.5	ND (<20)
CR Above Railroad	1	03/26/2008	26	ND (<2)	2.6	136	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	51	ND (<5)	6	3	ND (<5)	ND (<5)	1200	ND (<1)	2.4	ND (<20)
CR Above Railroad	1	04/08/2008	22	ND (<2)	2.6	153	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	51	ND (<5)	6	ND (<2)	ND (<5)	ND (<5)	1210	ND (<1)	2.5	ND (<20)
CR Above Railroad	1	05/20/2008	21	ND (<2)	2.7	150	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	54	ND (<5)	NR	2	ND (<5)	ND (<5)	NR	ND (<1)	2.6	ND (<20)
CR Above Railroad	1	06/10/2008	13	ND (<2)	2.6	149	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	53	ND (<5)	6	4	ND (<5)	ND (<5)	1290	ND (<1)	2.6	ND (<20)
CR Above Railroad	1	07/08/2008	540	ND (<2)	2.8	145	ND (<0.5)	180	ND (<0.1)	ND (<10)	ND (<1)	49	ND (<5)	6	2	ND (<5)	ND (<5)	1250	ND (<1)	2.8	ND (<20)
CR Down River	1	11/03/2003	38	ND (<2)	2.5	128	ND (<0.5)	NA	ND (<0.1)	ND (<10)	ND (<1)	47	ND (<5)	5	3	ND (<5)	ND (<5)	1060	ND (<1)	2.3	ND (<20)
CR Down River	1	12/11/2003	ND (<10)	ND (<2)	2.6	137	ND (<0.5)	NA	ND (<0.1)	ND (<10)	ND (<1)	41	ND (<5)	5	3	ND (<5)	ND (<5)	1082	ND (<1)	NA	ND (<20)
CR Down River	1	07/10/2007	53	ND (<2)	2.7	157	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	54	ND (<5)	6	3	ND (<5)	ND (<5)	1160	ND (<1)	2.4	ND (<20)
CR Down River	1	08/14/2007	30	ND (<2)	2.8	146	ND (<0.5)	120	ND (<0.1)	ND (<10)	ND (<1)	49	ND (<5)	6	3	ND (<5)	ND (<5)	1160	ND (<1)	2.4	ND (<20)
CR Down River	1	09/11/2007	19	ND (<2)	3	139	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	47	ND (<5)	6	4	ND (<5)	ND (<5)	1150	ND (<1)	2.4	ND (<20)
CR Down River	1	10/09/2007	24	ND (<2)	2.9	156	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	54	ND (<5)	6	5	ND (<5)	ND (<5)	1220	ND (<1)	2.4	ND (<20)
CR Down River	1	11/14/2007	14	ND (<2)	2.8	161	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	55	ND (<5)	6	3	ND (<5)	ND (<5)	1200	ND (<1)	2.6	ND (<20)
CR Down River	1	12/11/2007	22	ND (<2)	2.6	149	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	48	6	6	5	ND (<5)	ND (<5)	1240	ND (<1)	2.3	ND (<20)
CR Down River	1	01/08/2008	18	ND (<2)	2.7	145	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	49	ND (<5)	6	4	ND (<5)	ND (<5)	1210	ND (<1)	2.4	ND (<20)
CR Down River	1	02/12/2008	39	ND (<2)	2.7	151	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	48	ND (<5)	6	4	ND (<5)	ND (<5)	1260	ND (<1)	2.5	ND (<20)
CR Down River	1	03/26/2008	22	ND (<2)	2.6	135	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	51	ND (<5)	6	3	ND (<5)	ND (<5)	1210	ND (<1)	2.4	ND (<20)
CR Down River	1	04/08/2008	20	ND (<2)	2.6	155	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	49	ND (<5)	6	2	ND (<5)	ND (<5)	1220	ND (<1)	2.5	ND (<20)
CR Down River	1	05/20/2008	62	ND (<2)	2.6	149	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	56	ND (<5)	NR	2	ND (<5)	ND (<5)	NR	ND (<1)	2.6	ND (<20)
CR Down River	1	06/10/2008	14	ND (<2)	2.7	156	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	53	ND (<5)	6	3	ND (<5)	ND (<5)	1300	ND (<1)	2.6	ND (<20)
CR Down River	1	07/08/2008	23	ND (<2)	2.7	144	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	49	ND (<5)	6	2	ND (<5)	ND (<5)	1230	ND (<1)	2.6	ND (<20)
CR Near Park Moabi	1	11/03/2003	ND (<10)	ND (<2)	2.4	130	ND (<0.5)	NA	ND (<0.1)	ND (<10)	ND (<1)	45	ND (<5)	5	3	ND (<5)	ND (<5)	1054	ND (<1)	2.3	ND (<20)
CR Near Park Moabi	1	12/11/2003	ND (<10)	ND (<2)	2.6	135	ND (<0.5)	NA	ND (<0.1)	ND (<10)	ND (<1)	41	ND (<5)	5	3	ND (<5)	ND (<5)	1072	ND (<1)	NA	ND (<20)
CR Near Park Moabi	1	07/10/2007	230	ND (<2)	2.7	155	ND (<0.5)	150	ND (<0.1)	ND (<10)	ND (<1)	53	ND (<5)	6	3	ND (<5)	ND (<5)	1160	ND (<1)	2.4	ND (<20)
CR Near Park Moabi	1	08/14/2007	27	ND (<2)	2.8	164	ND (<0.5)	120	ND (<0.1)	ND (<10)	ND (<1)	51	ND (<5)	6	3	ND (<5)	ND (<5)	1190	ND (<1)	2.4	ND (<20)
CR Near Park Moabi	1	09/11/2007	21	ND (<2)	3	148	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	51	ND (<5)	6	4	ND (<5)	ND (<5)	1170	ND (<1)	2.5	ND (<20)
CR Near Park Moabi	1	10/09/2007	120	ND (<2)	2.9	154	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	54	ND (<5)	6	5	ND (<5)	ND (<5)	1220	ND (<1)	2.5	ND (<20)
CR Near Park Moabi	1	11/14/2007	33	ND (<2)	2.8	157	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	54	ND (<5)	6	3	ND (<5)	ND (<5)	1200	ND (<1)	2.6	ND (<20)
CR Near Park Moabi	1	12/11/2007	32	ND (<2)	2.6	145	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	48	ND (<5)	6	5	ND (<5)	ND (<5)	1200	ND (<1)	2.2	ND (<20)
CR Near Park Moabi	1	01/08/2008	20	ND (<2)	2.7	145	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	48	ND (<5)	6	4	ND (<5)	ND (<5)	1200	ND (<1)	2.5	ND (<20)
CR Near Park Moabi	1	02/12/2008	34	ND (<2)	2.8	148	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	48	ND (<5)	6	4	ND (<5)	ND (<5)	1240	ND (<1)	2.5	ND (<20)
CR Near Park Moabi	1	03/26/2008	23	ND (<2)	2.7	141	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	51	ND (<5)	6	3	ND (<5)	ND (<5)	1260	ND (<1)	2.5	ND (<20)
CR Near Park Moabi	1	04/08/2008	19	ND (<2)	2.6	151	ND (<0.5)	130	ND (<0.1)	ND (<10)	ND (<1)	52	ND (<5)	6	ND (<2)	ND (<5)	ND (<5)	1200	ND (<1)	2.6	ND (<20)
CR Near Park Moabi	1	05/20/2008	17	ND (<2)	2.7	150	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	53	ND (<5)	NR	2	ND (<5)	ND (<5)	NR	ND (<1)	2.6	ND (<20)
CR Near Park Moabi	1	06/10/2008	12	ND (<2)	2.7	151	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	52	ND (<5)	6	4	ND (<5)	ND (<5)	1270	ND (<1)	2.6	ND (<20)
CR Near Park Moabi	1	07/08/2008	90	ND (<2)	2.6	144	ND (<0.5)	140	ND (<0.1)	ND (<10)	ND (<1)	48	ND (<5)	6	2	ND (<5)	ND (<5)	1230	ND (<1)	2.6	ND (<20)

Notes:

(1) Samples collected by the Metropolitan Water District of Southern California. Analysis conducted at Metropolitan's Water Quality Laboratory using USEPA method 200.8.

NA = not analyzed
NC = not collected
ND = not detected
NR = not reported
µg/L = microgram(s) per liter



LEGEND:

- Metropolitan Water District of Southern California Sample Location
- Area of Potential Effects
- PG&E Property Boundary

NOTE:

Map Source: CH2M HILL (2005-2008)

0 1,000 2,000 Feet

GRAPHIC SCALE

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

METROPOLITAN WATER DISTRICT SURFACE WATER SAMPLING LOCATIONS

ARCADIS

FIGURE
C-1

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGE\Topock\GW_Risk\MXD\Fig_C-1_MWD_SW_Sampling_Locs.mxd - 9/10/2009 @ 4:07:33 PM

ARCADIS

Appendix D

Evaluation of Other Chemicals

ARCADIS
Infrastructure, environment, buildings

Imagine the result

Pacific Gas and Electric Company

Appendix D – Evaluation of Other Chemicals

HERA of Groundwater Impacted by Activities at
SWMU 1/AOC 1 and SWMU 2
Topock Compressor Station, Needles, California

November 2009

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Acronyms and Abbreviations

CCC	criterion continuous concentration
CDPH	California Department of Public Health
DTSC	Department of Toxic Substances Control
ICOPC	initial constituent of potential concern
IRIS	Integrated Risk Information System
MCL	maximum contaminant level
RAWP	Risk Assessment Work Plan
RSL	Regional Sceening Level
USDOI	U.S. Department of the Interior
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

1. Introduction

This appendix presents a screening-level evaluation of specific chemicals that have been detected in groundwater or surface water. As described in Section 3.2 of the groundwater human health and ecological risk assessment (main text), there are a variety of general chemical parameters that have been monitored for purposes of describing the characteristics of the waters in each hydrogeologic group and to identify water sources, key chemical processes, and reactions that may be occurring along flow paths. As documented the Human Health and Ecological Risk Assessment Work Plan (RAWP) and RAWP Addendum (ARCADIS, 2008; 2009), the U.S. Department of the Interior (USDOI) and the California Department of Toxic Substances Control (DTSC) have requested a screening-level evaluation be conducted of 13 general chemical parameters to evaluate whether they should be considered for inclusion in the quantitative groundwater risk assessment or groundwater-to-surface water transport evaluation.

- Sodium
- Potassium
- Calcium
- Magnesium
- Fluoride
- Chloride
- Bicarbonate
- Sulfate
- Nitrate
- Ammonia
- Manganese
- Iron
- Sulfide

For purposes of this risk assessment, these 13 general chemical parameters are known as “other inorganic chemicals.”

In addition to the other inorganic chemicals, there have been chemicals measured infrequently (i.e., less frequently than metals) during the RCRA facility investigation/remedial investigation in selected wells and sampling events that are generally not believed to be associated with facility operations and/or known historical releases from the facility. These chemicals are monitored to assess their potential presence and occurrence in groundwater and include volatile organic compounds

(VOCs), semivolatile organic compounds, polychlorinated biphenyls, perchlorate, radionuclides, strontium, and total petroleum hydrocarbons. These chemicals have generally not been detected in groundwater or surface water. However, two radiological compounds, four VOCs, one PAH, perchlorate, and strontium have been detected in site groundwater and are included in this screening-level evaluation to evaluate whether they should be considered for inclusion in the quantitative groundwater risk assessment or groundwater-to-surface water transport evaluation:

- Gross BETA
- Uranium
- Benzene
- Carbon disulfide
- Toluene
- Naphthalene
- Perchlorate
- Strontium

Presented below are screening-level evaluations that consider, for each of the chemicals listed above, whether the chemical should be further considered for inclusion in the groundwater human health risk assessment or groundwater-to-surface water transport evaluation. Both screening evaluations are summarized in Figure D-1. In general, the approach used in these screening-level evaluations represents the approach developed in consultation with DTSC and USDOI, as documented in the RAWP and RAWP Addendum (ARCADIS, 2008; 2009). The human health groundwater screening evaluation is discussed in Section 2 below and is summarized in Table D-1. A chemical that "passes" (is not excluded by) the human health groundwater screening-level evaluation presented here is included in the list of groundwater initial constituents of potential concern (ICOPCs), as described in Section 3.2.2 of the main text. The groundwater-to-surface water transport screening evaluation is discussed in Section 3 below and is summarized in Table D-2. A chemical that passes the groundwater-to-surface water transport screening evaluation presented here is included in the list of floodplain ICOPCs, as described in Section 3.2.2 of the main text.

2. Human Health Groundwater Screening Evaluation

The human health groundwater screening evaluation described below is summarized in Table D-1 and in Figure D-1.

2.1 Comparison to Background Mean

The first step in the human health groundwater screening evaluation compares, for each chemical, the maximum detected concentration in site groundwater to the calculated background mean concentration. If the site maximum concentration is below the background mean concentration, the chemical is excluded from the groundwater risk assessment. This first step is a conservative screen; it may result in over-inclusion of chemicals. Calculated background mean concentrations are not available for sulfide, perchlorate, strontium, VOCs, or radionuclides; these chemicals are carried forwards to the second step of the groundwater screening-level evaluation. For those chemicals with calculated background mean concentrations, all site maximum concentrations exceed their corresponding background mean concentrations, with the exception of manganese. Thus, manganese is excluded from the groundwater risk assessment.

2.2 Comparison to Drinking Water Criteria

The second step in the human health groundwater screening evaluation involves a comparison of the maximum detected concentration in site groundwater to a drinking water criterion. Such a comparison enables a screening-out of chemicals considered to be within levels protective of human health. For each chemical, the drinking water criterion is taken from the following hierarchy:

1. California Department of Public Health (CDPH) primary maximum contaminant level (MCL) (CDPH, 2007a)

2. U.S. Environmental Protection Agency (USEPA) MCLs (USEPA, 2003)

3. CDPH Drinking Water Notification Level (CDPH, 2007b)

4. USEPA tap water Regional Screening Level (RSL) (USEPA, 2008a).

A chemical with a maximum detected concentration exceeding its drinking water criterion is considered further for inclusion in the groundwater risk assessment (i.e., is included in the groundwater constituent of potential concern selection process described in Section 4.1 of the main text). A chemical is excluded from the

groundwater risk assessment if its maximum concentration does not exceed its drinking water criterion.

2.3 Identification of Toxicity Criteria

For those chemicals that are detected above background (Section 2.1) but for which drinking water criteria are not available (Section 2.2), the third step in the human health groundwater screening evaluation involves a search for applicable toxicity criteria to use to evaluate these chemicals. Available toxicity databases were searched for applicable toxicity values, including the following:

1. USEPA on-line Integrated Risk Information System (IRIS) (USEPA, 2008b)

2. USEPA *Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites* (USEPA, 2008a).

The USEPA RSLs have superseded the USEPA Region 9 preliminary remediation goals, which comprise the second source of noncancer toxicity data identified in the RAWP (ARCADIS, 2008). Of note, the hierarchy of sources relied upon by USEPA in developing the RSLs is consistent with the hierarchy of specific sources cited in the RAWP (i.e., the USEPA IRIS, provisional peer-reviewed toxicity values derived by the USEPA Superfund Health Risk Technical Support Center [as cited in USEPA 2008a], and the USEPA Superfund program's Health Effects Assessment Summary Tables [USEPA, 1997]).

As indicated in Table D-1, toxicity criteria are not available for any of the remaining chemicals. This is not surprising, given that available toxicity criteria would normally be used by the regulatory agencies, such as USEPA, to develop some form of drinking water criterion (e.g., USEPA would typically develop a tap water RSL if a toxicity criterion were available). As agreed with USDOI and DTSC, chemicals are excluded from the groundwater risk assessment if risk-based toxicity criteria are not available.

2.4 Summary

The process and results of this human health groundwater screening evaluation are summarized in Table D-1. In conclusion, two of the chemicals – fluoride and nitrate as nitrogen – pass the screening evaluation and, therefore, are included as groundwater ICOPCs as defined in Section 3.2.2 of the main text.

3. Groundwater-to-Surface Water Transport Screening Evaluation

The groundwater-to-surface water transport screening evaluation described below is summarized in Table D-2 and in Figure D-1. The groundwater-to-surface water transport screening evaluation is similar to the human health groundwater screening evaluation described above, with two differences. First, only those site groundwater wells believed most likely to potentially impact the surface water of the Colorado River (i.e., those wells located within the floodplain area) are considered in the groundwater-to-surface water transport screening evaluation. Thus, the groundwater-to-surface water transport screening evaluation investigates chemicals on the basis of their maximum detected concentrations in floodplain wells only. (Perchlorate, VOCs, and radionuclides have not been detected in floodplain wells and, therefore, are excluded from this evaluation.) Second, the groundwater-to-surface water transport screening evaluation also includes ecological criteria in addition to drinking water criteria for human health, to be protective of both ecological receptors in the Colorado River and persons that may use the Colorado River as a source of potable water.

3.1 Comparison to Background Mean

Similar to the human health groundwater screening evaluation described above, the first step of the groundwater-to-surface water transport screening evaluation involves comparison of the maximum detected concentration in floodplain groundwater to the calculated background mean concentration. Such a comparison is a method by which a chemical deemed to be within background levels is eliminated from further consideration; if the floodplain maximum concentration is below the background mean concentration, the chemical is excluded from further consideration. Like the human health groundwater screening evaluation, this first step is a conservative screen; it may result in over-inclusion of chemicals. Those chemicals without a calculated background mean—sulfide and strontium—are carried forwards to the second step of the groundwater-to-surface water transport screening evaluation. Of those chemicals with calculated background mean concentrations, all floodplain maximum concentrations exceed corresponding background mean concentrations with the exception of manganese. Thus, manganese is excluded from further consideration, on the basis of this comparison of floodplain maximum concentration to background mean concentration.

3.2 Comparison to Drinking Water Criteria

In the second step of this evaluation, the maximum detected concentration of the chemical in floodplain groundwater is compared to a drinking water criterion. As is the case in the groundwater screening-level evaluation described above, each drinking water criterion is taken from the following hierarchy:

1. CDPH primary MCL (CDPH, 2007a)

2. USEPA MCL (USEPA, 2003)

3. CDPH Drinking Water Notification Level (CDPH, 2007b)

4. USEPA tap water RSL (USEPA, 2008a).

A chemical whose floodplain maximum concentration exceeds its drinking water criterion is included as a floodplain ICOPC as defined in Section 3.2.2 of the main text.

3.3 Comparison to Ecological Criteria

In the third step of this evaluation, chemicals are screened against the USEPA freshwater ecological criteria consisting of National Recommended Ambient Water Quality Criteria criterion continuous concentrations (CCCs) (USEPA, 2006). The CCC represents the highest concentration in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect. A chemical whose floodplain maximum concentration exceeds its ecological screening criterion is included as a floodplain ICOPC as defined in Section 3.2.2.

3.4 Summary

The process and results of this groundwater-to-surface water transport screening evaluation are summarized in Table D-2. Two chemicals – fluoride and nitrate as nitrogen – are included as floodplain ICOPCs (as discussed in Section 3.2.2 of the main text) because their maximum detected concentrations in floodplain groundwater exceed drinking water criteria. Three chemicals – ammonia as nitrogen, chloride, and iron – are included as floodplain ICOPCs because their maximum detected concentrations in floodplain groundwater exceed ecological criteria.

4. References

ARCADIS. 2008. *Human Health and Ecological Risk Assessment Work Plan, Topock Compressor Station, Needles, California*. August.

ARCADIS. 2009. *Addendum to the Revised Human Health and Ecological Risk Assessment Work Plan (August 2008), Topock Compressor Station, Needles, California.* December 23.

CDPH. 2007a. *Maximum Contaminant Levels and Regulatory Dates for Drinking Water, USEPA vs. California*. Available online at: http://www.cdph.ca.gov/certlic/drinkingwater/Documents/DWdocuments/EPAandCDPH.pdf. California Department of Public Health. September.

CDPH. 2007b. *Notification Levels for Chemicals in Drinking Water*. On-line table maintained available at: http://www.oehha.ca.gov/water/pals/. December 14.

USEPA. 1997. *Health Effects Assessment Summary Tables.* FY 1997 Update. U.S. Environmental Protection Agency. July.

USEPA. 2003. *National Primary Drinking Water Standards.* Available online at: http://www.epa.gov/safewater/consumer/pdf/mcl.pdf. U.S. Environmental Protection Agency, Office of Water. June.

USEPA. 2006. *National Recommended Water Quality Criteria*. Available online at: http://www.epa.gov/waterscience/criteria/wqcriteria.html. U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology.

USEPA. 2008a. *Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites tap water RSLs*. U.S. Environmental Protection Agency.

USEPA. 2008b. *Integrated Risk Information System (IRIS).* Available online at: http://www.epa.gov/iriswebp/iris/. U.S. Environmental Protection Agency. Accessed October.

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Tables

Table D-1. Human Health Groundwater Screening Evaluation

	Background Mean			Drinking Water Criteria		Determination of Inclusion in Groundwater Analysis	
Analyte	Maximum On-Site Concentration (mg/L)	Background Mean (3) (mg/L)	Max > Background Mean?	MCL/NL/RSL (mg/L)	Max > MCL/NL/RSL?	Included in Groundwater Analysis	Rationale
Ammonia as nitrogen (1)	180	0.32	Y			N	No MCL; no tox criteria
Bicarbonate	980	150 (4)	Y			N	No MCL; no tox criteria
Calcium, dissolved	1,870	85	Y			N	No MCL; no tox criteria
Chloride	22,300	365	Y			N	No MCL; no tox criteria
Fluoride	25	1.5	Y	2 (5)	Y	**Y**	**Max > MCL**
Iron, dissolved	21	0.34	Y	26 (6)	N	N	Max < RSL
Magnesium, dissolved	1,600	27	Y			N	No MCL; no tox criteria
Manganese, dissolved	9	126	N			N	Max < background mean
Nitrate as nitrogen (2)	32	2.1	Y	10 (7)	Y	**Y**	**Max > MCL**
Perchlorate	0	NC		0.006 (5)	N	N	Max<MCL
Potassium, dissolved	2,020	6.9	Y			N	No MCL; no tox criteria
Sodium, dissolved	13,600	296	Y			N	No MCL; no tox criteria
Strontium, dissolved	18	NC		22 (6)	N	N	Max < RSL
Sulfate	5,510	218	Y			N	No MCL; no tox criteria
Sulfide	2	NC				N	No MCL; no tox criteria
VOCs							
Benzene	0.0008	NC		0.001 (5)	N	N	Max < MCL
Carbon disulfide	0.0007	NC		0.16 (8)	N	N	Max < NL
Naphthalene	0.001	NC		0.017 (8)	N	N	Max < NL
Toluene	0.0011	NC		0.15 (5)	N	N	Max < MCL

Table D-1. Human Health Groundwater Screening Evaluation

	Background Mean			Drinking Water Criteria		Determination of Inclusion in Groundwater Analysis	
Analyte	Maximum On-Site Concentration (mg/L)	Background Mean (3) (mg/L)	Max > Background Mean?	MCL/NL/RSL (mg/L)	Max > MCL/NL/RSL?	Included in Groundwater Analysis	Rationale
Radionuclides							
Gross Beta	5.78 (pCI/L)	NC		50 (pCI/L) (5)	N	N	Max < MCL
Uranium, dissolved	0.8 (pCI/L)	NC		20 (pCI/L) (5)	N	N	Max < MCL

Notes:

(1) Ammonia as nitrogen is not analyzed as a volatile as per USEPA (2008). The categories of ammonia and ammonia as nitrogen are combined in this analysis.

(2) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

(3) Background mean calculated using means by well as reported in Table 2-10 of CH2M HILL (2008).

(4) Background mean was calculated for total alkalinity.

(5) California Department of Public Health primary MCL (CDPH, 2007)

(6) RSLs for Chemical Contaminants at Superfund Sites (USEPA, 2008)

(7) USEPA MCL (USEPA, 2002)

(8) California DPH Drinking Water Notification Level (NL) (CDPH, 2007b)

(9) Human health criteria is an MCL, NL, or RSL.

MCL = maximum contaminant level
mg/L = milligram(s) per liter
NC = not calculated
NL = notification level
RSL = regional screening level
USEPA = U.S. Environmental Protection Agency
VOC = volatile organic compound

Sources:

CDPH. 2007. Notification Levels for Chemicals in Drinking Water. On-line table maintained at URL: http://www.oehha.ca.gov/water/pals/. December 14.

CH2M HILL. 2008. Revised Groundwater Background Study Steps 3 and 4: Report of Results, PG&E Topock Compressor Station, Needles, California. January 15.

USEPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. Office of Solid Waste and Emergency Response (OSWER). December.

USEPA. 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites. U.S. Environmental Protection Agency. September 12.

Table D-2. Groundwater-to-Surface Water Transport Screening Evaluation

Analyte	Background Mean			Drinking Water Criteria		Ecological Criteria		Determination of Inclusion in Surface Water Analysis	
	Maximum Floodplain Conc. (mg/L)	Background Mean (3) (mg/L)	Max > Background Mean?	MCL/NL/RSL (mg/L)	Max > MCL/NL/RSL?	WQC (mg/L)	Max > WQC?	Included in Surface Water Analysis?	Rationale
Ammonia as nitrogen (1)	14	0.32	Y			1.41 (5) (6)	Y	**Y**	**Max > WQC**
Bicarbonate	980	150 (4)	Y					N	No MCL/NL/RSL; no eco criteria
Calcium, dissolved	1,870	85	Y					N	No MCL/NL/RSL; no eco criteria
Chloride	22,300	365	Y			230 (5)	Y	**Y**	**Max > WQC**
Fluoride	9	1.5	Y	2 (7)	Y			**Y**	**Max > MCL**
Iron, dissolved	21	0.34	Y	26 (8)	N	1 (5)	Y	**Y**	**Max < RSL; Max > WQC**
Magnesium, dissolved	1,600	27	Y					N	No MCL/NL/RSL; no eco criteria
Manganese, dissolved	9	126	N					N	Max < background mean
Nitrate as nitrogen (2)	25	2.1	Y	10 (9)	Y			**Y**	**Max > MCL**
Perchlorate	ND	NC		0.006 (7)	N			N	No detections in floodplain
Potassium, dissolved	2,020	6.9	Y					N	No MCL/NL/RSL; no eco criteria
Sodium, dissolved	13,600	296	Y					N	No MCL/NL/RSL; no eco criteria
Strontium, dissolved	18	NC		22 (8)	N			N	Max < RSL
Sulfate	5,510	218	Y					N	No MCL/NL/RSL; no eco criteria
Sulfide	2	NC						N	No MCL/NL/RSL; no eco criteria
VOCs									
Benzene	ND	NC		0.001 (7)	-			N	No detections in floodplain
Carbon disulfide	ND	NC		0.16 (10)	-			N	No detections in floodplain
Naphthalene	ND	NC		0.017 (10)	-			N	No detections in floodplain
Toluene	ND	NC		0.15 (7)	-			N	No detections in floodplain
Radionuclides									
Gross Beta	ND	NC		50 (pCI/L) (7) [5]	-		[5]	N	Not sampled for in floodplain
Uranium, dissolved	ND	NC		20 (pCI/L) (7)	-			N	Not sampled for in floodplain

Table D-2. Groundwater-to-Surface Water Transport Screening Evaluation

Notes:

(1) Ammonia as nitrogen is not analyzed as a volatile as per USEPA (2008). The categories of ammonia and ammonia as nitrogen are combined in this analysis.

(2) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

(3) Background mean calculated using means by well as reported in Table 2-10 of CH2M HILL (2008).

(4) Background mean was calculated for total alkalinity.

(5) USEPA (2006).

(6) Fresh Water Ecological WQC estimated based on a range of surface water temperature (7.72 to 36.9 C) and pH (5.67 to 9.86) as reported in CH2M HILL (2009).

(7) California DPH primary MCL (CDPH, 2007).

(8) RSLs for Chemical Contaminants at Superfund Sites (USEPA, 2008)

(9) USEPA MCL (USEPA, 2002)

(10) California DPH Drinking Water NL (CDPH, 2007)

(11) The ecological criteria is a fresh water ecological WQC. Health criteria is an MCL, NL, or RSL.

DPH = Department of Public Health
MCL = maximum contaminant level
mg/L = milligram(s) per liter
NC = not calculated
ND = not detected
NL = notification level
RSL = regional screening level
USEPA = U.S. Environmental Protection Agency
VOC = volatile organic compound
WQC = water quality criteria

Sources:

CDPH. 2007. Notification Levels for Chemicals in Drinking Water. On-line table maintained at URL: http://www.oehha.ca.gov/water/pals/. December 14.

CH2M HILL. 2008. Revised Groundwater Background Study Steps 3 and 4: Report of Results, PG&E Topock Compressor Station, Needles, California. January 15.

CH2M HILL. 2009. Final RCRA Facility Investigation/Remedial Investigation Report Volume 2 Addendum. Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, PG&E Topock Compressor Station, Needles, California. June.

USEPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. Office of Solid Waste and Emergency Response (OSWER). December.

USEPA. 2006. National Recommended Water Quality Criteria. Office of Water. Office of Science and Technology. URL: http://www.epa.gov/waterscience/criteria/wqcriteria.html.

USEPA. 2008. Regional Screening Levels for Chemical Contaminants at Superfund Sites. U.S. Environmental Protection Agency. September 12.

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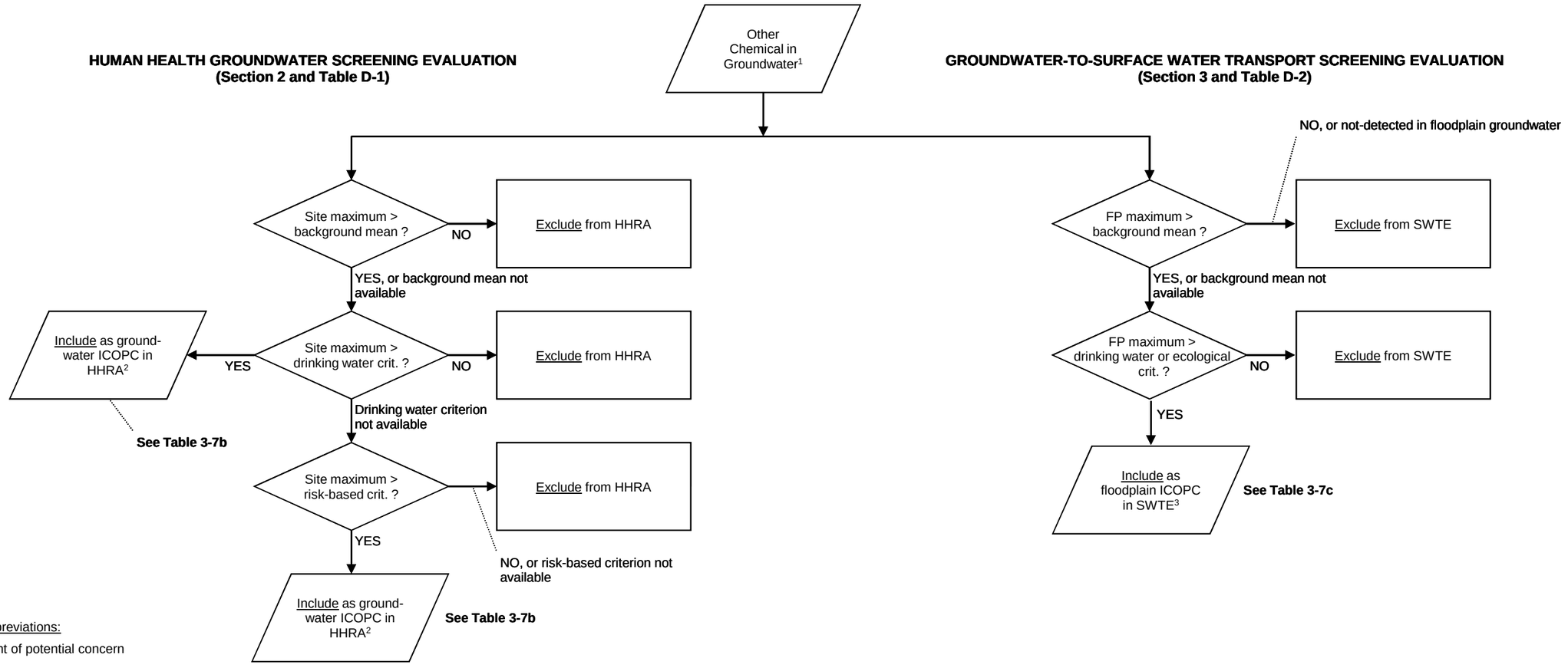
Figure

SCREENING EVALUATIONS OF OTHER CHEMICALS[1]
(Appendix D)



Acronyms and Abbreviations:

COPC = constituent of potential concern

crit. = criterion

FP = floodplain

HHRA = well-specific quantitative groundwater human health risk assessment

ICOPC = initial constituent of potential concern

SWTE = groundwater-to-surface water transport evaluation

Notes:

(1) This flowchart provides the details of screening evaluations which occur within the broader ICOPC selection processes summarized in Figure 3-1.

(2) Chemicals determined to be groundwater ICOPCs are carried forwards to the well-specific COPC selection processes. Determination of well-specific COPCs is discussed in Section 4.1.1 and summarized in Figure 4-1.

(3) Chemicals determined to be floodplain ICOPCs are carried forwards to the groundwater-to-surface-water transport COPC selection process that is discussed in Section 4.1.2 and summarized in Figure 4-2.

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

SCREENING EVALUATIONS OF OTHER CHEMICALS

ARCADIS

FIGURE
D-1

ARCADIS

Appendix E

Data Usability Matrix

ARCADIS
Infrastructure, environment, buildings

Imagine the result

Pacific Gas and Electric Company

Appendix E – Data Usability Matrix

HERA of Groundwater Impacted by Activities at
SWMU 1/AOC 1 and SWMU 2
Topock Compressor Station, Needles, California

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1. Data Usability Matrix **1**

Table

E-1 Data Usability Matrix

1. Data Usability Matrix

The purpose of this appendix is to present Table E-1 which summarizes key statistics relating to the usability of the groundwater data used in the Human and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2. It is important to note that this table is simply an overview of key statistical descriptors of the data that provide information about the overall usability of the data. Specific issues relating to data usability are presented in more detail and discussed in Sections 3.2.3, 3.3, and 9 of the main text of the groundwater risk assessment, and Tables 3-9, and 9-3 through 9-6 of the main text.

Table

Table E-1. Data Usability Matrix

Constituent of Potential Concern (COPC)	Total Number of Samples	Total Number of Nondetects	Minimum Detection Limit[1] (mg/L)	Maximum Detection Limit[1] (mg/L)	Mode Detection Limit[1] (mg/L)	Background Upper Tolerance Limit (UTL) (mg/L)	Number of Detection Limits Above the UTL[1]	Percentage of Detection Limits Above the UTL[1,2a]	Risk-based Concentration (RBC) (mg/L)	Number of Detection Limits Above the RBC[1]	Percentage of Detection Limits Above the RBC[1,2b]	Maximum Contaminant Level (MCL) (mg/L)	Number of Detection Limits Above the MCL[1]	Percentage of Detection Limits Above the MCL[1,2b]	Surface Water Criteria (mg/L)	Number of Detection Limits Above the Surface Water Criteria[1]	Percentage of Detection Limits Above the Surface Water Criteria[1,2c]	Number of "J" Qualified Samples	Number of "UJ" Qualified Samples	Number of "R" Qualified Samples	Number of "UR" Qualified Samples
Aluminum	294	273	5.0E-02	5.2E-01	5.2E-02	5.58E-02	10	3.7%	1.55E+01	0	0.0%	1.00E+00	0	0.0%	1.00E+00	0	0.0%	1	0	0	0
Antimony	384	375	2.0E-03	2.0E-02	2.0E-03	1.22E-03	375	100.0%	6.22E-03	1	0.3%	6.00E-03	1	0.3%	6.00E-03	1	0.3%	0	0	0	0
Arsenic	460	270	1.0E-03	4.0E-02	5.0E-03	2.43E-02	2	0.7%	7.07E-06	270	100.0%	1.00E-02	2	0.7%	1.00E-02	2	0.7%	0	0	0	0
Barium	559	198	1.0E-03	5.0E-01	3.0E-01	1.95E-01	197	99.5%	3.11E+00	0	0.0%	1.00E+00	0	0.0%	4.00E-03	197	99.5%	8	0	0	0
Beryllium	374	354	1.0E-03	1.2E-02	1.0E-03	6.63E-04	354	100.0%	3.11E-02	0	0.0%	4.00E-03	10	2.8%	6.60E-04	354	100.0%	0	3	0	0
Cadmium	374	373	1.0E-03	1.2E-02	1.0E-03	NA	NA	NA	7.77E-03	1	0.3%	5.00E-03	1	0.3%	5.00E-03	1	0.3%	0	0	0	0
Chromium, hexavalent	2,780	1,130	2.0E-04	1.0E-02	1.0E-03	3.18E-02	0	0.0%	4.63E-02	0	0.0%	5.00E-02	0	0.0%	1.10E-02	0	0.0%	60	57	8	16
Cobalt	374	361	1.0E-03	1.2E-02	5.0E-03	8.43E-04	361	100.0%	4.66E-03	136	37.7%	NA	NA	NA	2.30E-02	0	0.0%	0	0	0	0
Copper	1,049	691	1.0E-03	4.0E-01	1.0E-02	1.05E-02	120	17.4%	6.22E-01	0	0.0%	1.30E+00	0	0.0%	2.30E-02	25	3.6%	202	0	0	0
Fluoride	491	65	1.0E-01	1.3E+01	5.0E+00	7.12E+00	6	9.2%	9.32E-01	39	60.0%	2.00E+00	27	41.5%	2.00E+00	27	41.5%	7	6	0	0
Lead	474	412	1.0E-03	1.0E-01	1.0E-03	1.91E-03	268	65.0%	NA	NA	NA	1.50E-02	3	0.7%	8.00E-03	3	0.7%	23	0	0	0
Mercury	380	379	2.0E-04	5.0E-04	2.0E-04	NA	NA	NA	4.66E-03	0	0.0%	2.00E-03	0	0.0%	5.00E-05	379	100.0%	1	1	0	0
Molybdenum	563	35	2.0E-03	5.0E-02	5.0E-03	3.63E-02	7	20.0%	7.77E-02	0	0.0%	NA	NA	NA	3.70E-01	0	0.0%	4	0	0	0
Nickel	1,049	570	1.0E-03	4.0E-01	2.0E-02	1.06E-02	420	73.7%	3.12E-01	6	1.1%	1.00E-01	6	1.1%	1.00E-01	6	1.1%	222	1	0	0
Nitrate as nitrogen	844	271	1.0E-01	2.0E+02	5.0E-01	5.03E+00	4	1.5%	2.49E+01	1	0.4%	1.00E+01	1	0.4%	1.00E+01	1	0.4%	23	7	1	1
Selenium	396	228	1.0E-03	4.0E-02	5.0E-03	1.03E-02	1	0.4%	7.77E-02	0	0.0%	5.00E-02	0	0.0%	5.00E-03	85	37.3%	0	0	0	0
Silver	374	366	1.0E-03	5.0E-02	1.0E-03	2.13E-03	226	61.7%	7.79E-02	0	0.0%	1.00E-01	0	0.0%	3.60E-04	366	100.0%	0	1	0	0
Thallium	374	372	1.0E-03	6.0E-02	1.0E-03	9.08E-04	372	100.0%	1.01E-03	129	34.7%	2.00E-03	121	32.5%	1.70E-03	129	34.7%	0	1	0	0
Vanadium	462	90	1.0E-03	1.2E-02	5.0E-03	5.99E-02	0	0.0%	1.09E-01	0	0.0%	5.00E-02	0	0.0%	2.00E-02	0	0.0%	29	1	0	0
Zinc	1,049	324	5.0E-03	2.0E-01	2.0E-02	7.77E-02	8	2.5%	4.67E+00	0	0.0%	5.00E+00	0	0.0%	3.00E-01	0	0.0%	98	6	0	0

Notes:

(1) Only detection limits from nondetect samples are included in these analyses. The percentage shown is the percentage of nondetect samples.

(2) The implications of elevated detection limits on the risk assessment are discussed in detail in Section 9 and presented in Tables 9-3 thru 9-6. Data usability is also discussed in Sections 3.2.3 and 3.3 and presented in Table 3-9.

(a) In particular see discussion in Section 9.2.3 and Table 9-3 regarding the possibility of incorrectly excluding a chemical from the assessment, and the likelihood that this could result in a material underestimation of risk and/or hazard.

(b) In particular see discussion in Section 9.4.2.1 and Table 9-6 regarding the possibility of that elevated detection limits could result in the underestimation of risk/and or hazard.

(c) In particular see discussion in Section 9.3 and Tables 9-4 and 9-5 regarding the possibility detection limits could impact the significance of the groundwater-to-surface water transport pathway.

(3) NA = Not available, one of the folllowing applies:

(a) Cadmium and mercury were not detected in background wells, and therefore UTLs were not calculated in the background study, CH2M HILL (2008).

(b) As described in Section 6.3 of the text, the noncarcinogenic hazard from lead is not evaluated using the traditional reference dose approach and therefore a risk-based concentration cannot be calculated for lead.

(c) MCLs are not promulgated for cadmium or molybdenum.

(4) Laboratory qualifiers:

J = Estimated

UJ = Estimated nondetect

R = Rejected

UR = Rejected nondetect

B = The analyte was detected above MDL in the lab blank

References:

CH2M HILL. 2008. Revised Groundwater Background Study Steps 3 and 4: Final Report of Results, PG&E Topock Compressor Station, Needles, California. July.

ARCADIS

Appendix F

ProUCL 4.0 Output Reports

ARCADIS

Well-Specific

ProUCL Outputs

General UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Arsenic, dissolved (1)

General Statistics

Number of Valid Data	132	Number of Detected Data	129
Number of Distinct Detected Data	118	Number of Non-Detect Data	3
		Percent Non-Detects	2.27%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.00107	Minimum Detected	-6.84
Maximum Detected	0.0191	Maximum Detected	-3.958
Mean of Detected	0.00598	Mean of Detected	-5.31
SD of Detected	0.00389	SD of Detected	0.634
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.161	Lilliefors Test Statistic	0.105
5% Lilliefors Critical Value	0.078	5% Lilliefors Critical Value	0.078
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00585	Mean	-5.362
SD	0.00393	SD	0.715
95% DL/2 (t) UCL	0.00642	95% H-Stat (DL/2) UCL	0.0066
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00582	Mean in Log Scale	-5.346
SD	0.00397	SD in Log Scale	0.671
95% MLE (t) UCL	0.00639	Mean in Original Scale	0.00586
95% MLE (Tiku) UCL	0.00637	SD in Original Scale	0.00391
		95% Percentile Bootstrap UCL	0.00646
		95% BCA Bootstrap UCL	0.00645

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	2.728	**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
Theta Star	0.00219		
nu star	703.8		
A-D Test Statistic	1.568	**Nonparametric Statistics**	
5% A-D Critical Value	0.76	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.76	Mean	0.00586
5% K-S Critical Value	0.0826	SD	0.0039

54	Data follow Appr. Gamma Distribution at 5% Significance Level										SE of Mean	0.0003405
55											95% KM (t) UCL	0.00643
56	Assuming Gamma Distribution										95% KM (z) UCL	0.00642
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00643
58	Minimum	1E-09									95% KM (bootstrap t) UCL	0.00649
59	Maximum	0.0191									95% KM (BCA) UCL	0.00645
60	Mean	0.00584									95% KM (Percentile Bootstrap) UCL	0.00643
61	Median	0.00538									95% KM (Chebyshev) UCL	0.00735
62	SD	0.00394									97.5% KM (Chebyshev) UCL	0.00799
63	k star	1.083									99% KM (Chebyshev) UCL	0.00925
64	Theta star	0.00539										
65	Nu star	286									Potential UCLs to Use	
66	AppChi2	247.8									95% KM (BCA) UCL	0.00645
67	95% Gamma Approximate UCL	0.00674										
68	95% Adjusted Gamma UCL	0.00675										
69	Note: DL/2 is not a recommended method.											
70												
71												
72	Arsenic, dissolved (cw-1d)											
73												
74	General Statistics											
75	Number of Valid Data	8									Number of Detected Data	2
76	Number of Distinct Detected Data	2									Number of Non-Detect Data	6
77											Percent Non-Detects	75.00%
78												
79	Raw Statistics										Log-transformed Statistics	
80	Minimum Detected	0.00232									Minimum Detected	-6.066
81	Maximum Detected	0.00275									Maximum Detected	-5.896
82	Mean of Detected	0.00254									Mean of Detected	-5.981
83	SD of Detected	0.0003041									SD of Detected	0.12
84	Minimum Non-Detect	0.005									Minimum Non-Detect	-5.298
85	Maximum Non-Detect	0.01									Maximum Non-Detect	-4.605
86												
87	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
88	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
89	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
90												
91	Warning: Data set has only 2 Distinct Detected Values.											
92	This may not be adequate enough to compute meaningful and reliable test statistics and estimates.											
93	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
94												
95	Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.											
96												
97	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
98	Those methods will return a 'N/A' value on your output display!											
99												
100	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
101	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
102												
103												
104	UCL Statistics											
105	Normal Distribution Test with Detected Values Only										Lognormal Distribution Test with Detected Values Only	
106	Shapiro Wilk Test Statistic	1									Shapiro Wilk Test Statistic	1

107				5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
108	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**	
109											
110	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
111				DL/2 Substitution Method						DL/2 Substitution Method	
112				Mean	0.00313					Mean	-5.816
113				SD	0.00116					SD	0.323
114				95% DL/2 (t) UCL	0.00391					95% H-Stat (DL/2) UCL	0.00814
115											
116				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
117	**MLE method failed to converge properly**									Mean in Log Scale	N/A
118										SD in Log Scale	N/A
119										Mean in Original Scale	N/A
120										SD in Original Scale	N/A
121										95% Percentile Bootstrap UCL	N/A
122										95% BCA Bootstrap UCL	N/A
123											
124	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**	
125				k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**	
126				Theta Star	N/A						
127				nu star	N/A						
128											
129				A-D Test Statistic	0.359					**Nonparametric Statistics**	
130				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
131				K-S Test Statistic	N/A					Mean	0.00254
132				5% K-S Critical Value	N/A					SD	0.000215
133	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.000215
134										95% KM (t) UCL	0.00294
135	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00289
136				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00307
137				Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
138				Maximum	N/A					95% KM (BCA) UCL	N/A
139				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00275
140				Median	N/A					95% KM (Chebyshev) UCL	0.00347
141				SD	N/A					97.5% KM (Chebyshev) UCL	0.00388
142				k star	N/A					99% KM (Chebyshev) UCL	0.00467
143				Theta star	N/A						
144				Nu star	N/A					**Potential UCLs to Use**	
145				AppChi2	N/A					95% KM (t) UCL	0.00294
146				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.00275
147				95% Adjusted Gamma UCL	N/A						
148	**Warning: Recommended UCL exceeds the maximum observation**										
149	**Note: DL/2 is not a recommended method.**										
150											
151											
152	**Arsenic, dissolved (cw-1m)**										
153											
154	**General Statistics**										
155				Number of Valid Data	8					Number of Detected Data	3
156				Number of Distinct Detected Data	3					Number of Non-Detect Data	5
157										Percent Non-Detects	62.50%
158											
159	**Raw Statistics**									**Log-transformed Statistics**	

160				Minimum Detected	0.00206					Minimum Detected	-6.185	
161				Maximum Detected	0.00228					Maximum Detected	-6.084	
162				Mean of Detected	0.00219					Mean of Detected	-6.126	
163				SD of Detected	0.0001137					SD of Detected	0.0526	
164				Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298	
165				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
166												
167	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	8	
168	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
169	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
170												
171	**Warning: There are only 3 Distinct Detected Values in this data set**											
172	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
173	**Those methods will return a 'N/A' value on your output display!**											
174												
175	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
176	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
177												
178												
179	**UCL Statistics**											
180	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
181				Shapiro Wilk Test Statistic	0.936					Shapiro Wilk Test Statistic	0.93	
182				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
183	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
184												
185	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
186				DL/2 Substitution Method						DL/2 Substitution Method		
187				Mean	0.00301					Mean	-5.869	
188				SD	0.00124					SD	0.359	
189				95% DL/2 (t) UCL	0.00384					95% H-Stat (DL/2) UCL	0.0115	
190												
191				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
192	**MLE method failed to converge properly**									Mean in Log Scale	-6.126	
193										SD in Log Scale	0.0427	
194										Mean in Original Scale	0.00219	
195										SD in Original Scale	9.296E-05	
196										95% Percentile Bootstrap UCL	0.00224	
197										95% BCA Bootstrap UCL	0.00224	
198												
199	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
200				k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**		
201				Theta Star	N/A							
202				nu star	N/A							
203												
204				A-D Test Statistic	0.342					**Nonparametric Statistics**		
205				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
206				K-S Test Statistic	N/A					Mean	0.00219	
207				5% K-S Critical Value	N/A					SD	9.286E-05	
208	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	6.566E-05	
209										95% KM (t) UCL	0.00231	
210	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00229	
211				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00233	
212				Minimum	N/A					95% KM (bootstrap t) UCL	0.00231	

213					Maximum	N/A					95% KM (BCA) UCL	0.00227
214					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00228
215					Median	N/A					95% KM (Chebyshev) UCL	0.00247
216					SD	N/A					97.5% KM (Chebyshev) UCL	0.0026
217					k star	N/A					99% KM (Chebyshev) UCL	0.00284
218					Theta star	N/A						
219					Nu star	N/A					**Potential UCLs to Use**	
220					AppChi2	N/A					95% KM (t) UCL	0.00231
221					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.00228
222					95% Adjusted Gamma UCL	N/A						
223	**Warning: Recommended UCL exceeds the maximum observation**											
224	**Note: DL/2 is not a recommended method.**											
225												
226												
227	**Arsenic, dissolved (cw-2d)**											
228												
229	**General Statistics**											
230					Number of Valid Data	8					Number of Detected Data	2
231					Number of Distinct Detected Data	2					Number of Non-Detect Data	6
232											Percent Non-Detects	75.00%
233												
234	**Raw Statistics**						**Log-transformed Statistics**					
235					Minimum Detected	0.0039					Minimum Detected	-5.547
236					Maximum Detected	0.00491					Maximum Detected	-5.316
237					Mean of Detected	0.00441					Mean of Detected	-5.432
238					SD of Detected	0.0007142					SD of Detected	0.163
239					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
240					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
241												
242	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
243	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
244	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
245												
246	**Warning: Data set has only 2 Distinct Detected Values.**											
247	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
248	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
249												
250	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
251												
252	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
253	**Those methods will return a 'N/A' value on your output display!**											
254												
255	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
256	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
257												
258												
259	**UCL Statistics**											
260	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
261					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
262					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
263	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
264												
265	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					

266				DL/2 Substitution Method						DL/2 Substitution Method		
267				Mean	0.0036					Mean	-5.678	
268				SD	0.00123					SD	0.344	
269				95% DL/2 (t) UCL	0.00442					95% H-Stat (DL/2) UCL	0.00668	
270												
271				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
272				**MLE method failed to converge properly**						Mean in Log Scale	N/A	
273										SD in Log Scale	N/A	
274										Mean in Original Scale	N/A	
275										SD in Original Scale	N/A	
276										95% Percentile Bootstrap UCL	N/A	
277										95% BCA Bootstrap UCL	N/A	
278												
279				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
280				k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**		
281				Theta Star	N/A							
282				nu star	N/A							
283												
284				A-D Test Statistic	0.359					**Nonparametric Statistics**		
285				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
286				K-S Test Statistic	N/A					Mean	0.00441	
287				5% K-S Critical Value	N/A					SD	0.000505	
288				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.000505	
289										95% KM (t) UCL	0.00536	
290				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00524	
291				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00567	
292				Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308	
293				Maximum	N/A					95% KM (BCA) UCL	0.00491	
294				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00491	
295				Median	N/A					95% KM (Chebyshev) UCL	0.00661	
296				SD	N/A					97.5% KM (Chebyshev) UCL	0.00756	
297				k star	N/A					99% KM (Chebyshev) UCL	0.00943	
298				Theta star	N/A							
299				Nu star	N/A					**Potential UCLs to Use**		
300				AppChi2	N/A					95% KM (t) UCL	0.00536	
301				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.00491	
302				95% Adjusted Gamma UCL	N/A							
303	**Warning: Recommended UCL exceeds the maximum observation**											
304	**Note: DL/2 is not a recommended method.**											
305												
306												
307	**Arsenic, dissolved (cw-2m)**											
308												
309	**General Statistics**											
310				Number of Valid Data	8					Number of Detected Data	3	
311				Number of Distinct Detected Data	3					Number of Non-Detect Data	5	
312										Percent Non-Detects	62.50%	
313												
314				**Raw Statistics**						**Log-transformed Statistics**		
315				Minimum Detected	0.00235					Minimum Detected	-6.053	
316				Maximum Detected	0.00279					Maximum Detected	-5.882	
317				Mean of Detected	0.00253					Mean of Detected	-5.981	
318				SD of Detected	0.000229					SD of Detected	0.0889	

319					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
320					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
321												
322	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
323	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
324	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
325												
326	**Warning: There are only 3 Distinct Detected Values in this data set**											
327	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
328	**Those methods will return a 'N/A' value on your output display!**											
329												
330	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
331	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
332												
333												
334	**UCL Statistics**											
335	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
336	Shapiro Wilk Test Statistic					0.923	Shapiro Wilk Test Statistic					0.932
337	5% Shapiro Wilk Critical Value					0.767	5% Shapiro Wilk Critical Value					0.767
338	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
339												
340	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
341	DL/2 Substitution Method						DL/2 Substitution Method					
342	Mean					0.00314	Mean					-5.814
343	SD					0.00116	SD					0.322
344	95% DL/2 (t) UCL					0.00391	95% H-Stat (DL/2) UCL					0.0101
345												
346	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
347	**MLE method failed to converge properly**						Mean in Log Scale					-5.981
348							SD in Log Scale					0.0722
349							Mean in Original Scale					0.00253
350							SD in Original Scale					0.0001842
351							95% Percentile Bootstrap UCL					0.00264
352							95% BCA Bootstrap UCL					0.00264
353												
354	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
355	k star (bias corrected)					N/A	**Data appear Normal at 5% Significance Level**					
356	Theta Star					N/A						
357	nu star					N/A						
358												
359	A-D Test Statistic					0.346	**Nonparametric Statistics**					
360	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
361	K-S Test Statistic					N/A	Mean					0.00253
362	5% K-S Critical Value					N/A	SD					0.000187
363	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0001322
364							95% KM (t) UCL					0.00278
365	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00275
366	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00282
367	Minimum					N/A	95% KM (bootstrap t) UCL					0.00328
368	Maximum					N/A	95% KM (BCA) UCL					0.00279
369	Mean					N/A	95% KM (Percentile Bootstrap) UCL					0.00279
370	Median					N/A	95% KM (Chebyshev) UCL					0.00311
371	SD					N/A	97.5% KM (Chebyshev) UCL					0.00336

372					k star	N/A					99% KM (Chebyshev) UCL	0.00385
373					Theta star	N/A						
374					Nu star	N/A					**Potential UCLs to Use**	
375					AppChi2	N/A					95% KM (t) UCL	0.00278
376					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.00279
377					95% Adjusted Gamma UCL	N/A						
378	**Note: DL/2 is not a recommended method.**											
379												
380												
381	**Arsenic, dissolved (cw-3d)**											
382												
383	**General Statistics**											
384					Number of Valid Data	8					Number of Detected Data	2
385					Number of Distinct Detected Data	2					Number of Non-Detect Data	6
386											Percent Non-Detects	75.00%
387												
388	**Raw Statistics**						**Log-transformed Statistics**					
389					Minimum Detected	0.00128					Minimum Detected	-6.661
390					Maximum Detected	0.00172					Maximum Detected	-6.365
391					Mean of Detected	0.0015					Mean of Detected	-6.513
392					SD of Detected	0.0003111					SD of Detected	0.209
393					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
394					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
395												
396	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
397	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
398	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
399												
400	**Warning: Data set has only 2 Distinct Detected Values.**											
401	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
402	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
403												
404	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
405												
406	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
407	**Those methods will return a 'N/A' value on your output display!**											
408												
409	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
410	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
411												
412												
413	**UCL Statistics**											
414	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
415					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
416					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
417	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
418												
419	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
420					DL/2 Substitution Method						DL/2 Substitution Method	
421					Mean	0.00288					Mean	-5.949
422					SD	0.00139					SD	0.468
423					95% DL/2 (t) UCL	0.0038					95% H-Stat (DL/2) UCL	0.0121
424												

425	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
426	**MLE method failed to converge properly**						Mean in Log Scale					N/A
427							SD in Log Scale					N/A
428							Mean in Original Scale					N/A
429							SD in Original Scale					N/A
430							95% Percentile Bootstrap UCL					N/A
431							95% BCA Bootstrap UCL					N/A
432												
433	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
434	k star (bias corrected)					N/A	**Data do not follow a Discernable Distribution (0.05)**					
435	Theta Star					N/A						
436	nu star					N/A						
437												
438	A-D Test Statistic					0.359	**Nonparametric Statistics**					
439	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
440	K-S Test Statistic					N/A	Mean					0.0015
441	5% K-S Critical Value					N/A	SD					0.00022
442	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.00022
443							95% KM (t) UCL					0.00192
444	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00186
445	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00205
446	Minimum					N/A	95% KM (bootstrap t) UCL					1.8E+308
447	Maximum					N/A	95% KM (BCA) UCL					0.00172
448	Mean					N/A	95% KM (Percentile Bootstrap) UCL					0.00172
449	Median					N/A	95% KM (Chebyshev) UCL					0.00246
450	SD					N/A	97.5% KM (Chebyshev) UCL					0.00287
451	k star					N/A	99% KM (Chebyshev) UCL					0.00369
452	Theta star					N/A						
453	Nu star					N/A	**Potential UCLs to Use**					
454	AppChi2					N/A	95% KM (t) UCL					0.00192
455	95% Gamma Approximate UCL					N/A	95% KM (% Bootstrap) UCL					0.00172
456	95% Adjusted Gamma UCL					N/A						
457	**Warning: Recommended UCL exceeds the maximum observation**											
458	**Note: DL/2 is not a recommended method.**											
459												
460												
461	**Arsenic, dissolved (cw-3m)**											
462												
463	**General Statistics**											
464	Number of Valid Data					8	Number of Detected Data					2
465	Number of Distinct Detected Data					1	Number of Non-Detect Data					6
466							Percent Non-Detects					75.00%
467												
468	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
469	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
470												
471	**The data set for variable Arsenic, dissolved (cw-3m) was not processed!**											
472												
473												
474												
475	**Arsenic, dissolved (cw-4d)**											
476												
477	**General Statistics**											

478					Number of Valid Data	8					Number of Detected Data	2
479					Number of Distinct Detected Data	2					Number of Non-Detect Data	6
480											Percent Non-Detects	75.00%
481												
482					**Raw Statistics**						**Log-transformed Statistics**	
483					Minimum Detected	0.00342					Minimum Detected	-5.678
484					Maximum Detected	0.00389					Maximum Detected	-5.549
485					Mean of Detected	0.00366					Mean of Detected	-5.614
486					SD of Detected	0.0003323					SD of Detected	0.0911
487					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
488					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
489												
490	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
491	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
492	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
493												
494	**Warning: Data set has only 2 Distinct Detected Values.**											
495	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
496	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
497												
498	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
499												
500	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
501	**Those methods will return a 'N/A' value on your output display!**											
502												
503	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
504	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
505												
506												
507	**UCL Statistics**											
508	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
509					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
510					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
511	**Data not Normal at 5% Significance Level**										**Data not Lognormal at 5% Significance Level**	
512												
513	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
514					DL/2 Substitution Method						DL/2 Substitution Method	
515					Mean	0.00341					Mean	-5.724
516					SD	0.00111					SD	0.312
517					95% DL/2 (t) UCL	0.00416					95% H-Stat (DL/2) UCL	0.00694
518												
519					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
520	**MLE method failed to converge properly**										Mean in Log Scale	N/A
521											SD in Log Scale	N/A
522											Mean in Original Scale	N/A
523											SD in Original Scale	N/A
524											95% Percentile Bootstrap UCL	N/A
525											95% BCA Bootstrap UCL	N/A
526												
527	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
528					k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**	
529					Theta Star	N/A						
530					nu star	N/A						

531												
532					A-D Test Statistic	0.359	**Nonparametric Statistics**					
533					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
534					K-S Test Statistic	N/A					Mean	0.00366
535					5% K-S Critical Value	N/A					SD	0.000235
536				**Data not Gamma Distributed at 5% Significance Level**							SE of Mean	0.000235
537											95% KM (t) UCL	0.0041
538				**Assuming Gamma Distribution**							95% KM (z) UCL	0.00404
539					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00424
540					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
541					Maximum	N/A					95% KM (BCA) UCL	0.00389
542					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00389
543					Median	N/A					95% KM (Chebyshev) UCL	0.00468
544					SD	N/A					97.5% KM (Chebyshev) UCL	0.00512
545					k star	N/A					99% KM (Chebyshev) UCL	0.00599
546					Theta star	N/A						
547					Nu star	N/A	**Potential UCLs to Use**					
548					AppChi2	N/A					95% KM (t) UCL	0.0041
549					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.00389
550					95% Adjusted Gamma UCL	N/A						
551	**Warning: Recommended UCL exceeds the maximum observation**											
552	**Note: DL/2 is not a recommended method.**											
553												
554												
555	**Arsenic, dissolved (cw-4m)**											
556												
557	**General Statistics**											
558					Number of Valid Data	8					Number of Detected Data	2
559					Number of Distinct Detected Data	2					Number of Non-Detect Data	6
560											Percent Non-Detects	75.00%
561												
562				**Raw Statistics**			**Log-transformed Statistics**					
563					Minimum Detected	0.00246					Minimum Detected	-6.008
564					Maximum Detected	0.0027					Maximum Detected	-5.915
565					Mean of Detected	0.00258					Mean of Detected	-5.961
566					SD of Detected	0.0001697					SD of Detected	0.0658
567					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
568					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
569												
570	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
571	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
572	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
573												
574	**Warning: Data set has only 2 Distinct Detected Values.**											
575	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
576	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
577												
578	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
579												
580	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
581	**Those methods will return a 'N/A' value on your output display!**											
582												
583	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											

	A	B	C	D	E	F	G	H	I	J	K	L
584	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
585												
586												
587	**UCL Statistics**											
588	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
589	Shapiro Wilk Test Statistic					1	Shapiro Wilk Test Statistic					1
590	5% Shapiro Wilk Critical Value					N/A	5% Shapiro Wilk Critical Value					N/A
591	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
592												
593	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
594	DL/2 Substitution Method						DL/2 Substitution Method					
595	Mean					0.00315	Mean					-5.811
596	SD					0.00115	SD					0.317
597	95% DL/2 (t) UCL					0.00391	95% H-Stat (DL/2) UCL					0.00637
598												
599	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
600	**MLE method failed to converge properly**						Mean in Log Scale					N/A
601							SD in Log Scale					N/A
602							Mean in Original Scale					N/A
603							SD in Original Scale					N/A
604							95% Percentile Bootstrap UCL					N/A
605							95% BCA Bootstrap UCL					N/A
606												
607	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
608	k star (bias corrected)					N/A	**Data do not follow a Discernable Distribution (0.05)**					
609	Theta Star					N/A						
610	nu star					N/A						
611												
612	A-D Test Statistic					0.359	**Nonparametric Statistics**					
613	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
614	K-S Test Statistic					N/A	Mean					0.00258
615	5% K-S Critical Value					N/A	SD					0.00012
616	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.00012
617							95% KM (t) UCL					0.00281
618	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00278
619	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00288
620	Minimum					N/A	95% KM (bootstrap t) UCL					0.00282
621	Maximum					N/A	95% KM (BCA) UCL					0.0027
622	Mean					N/A	95% KM (Percentile Bootstrap) UCL					N/A
623	Median					N/A	95% KM (Chebyshev) UCL					0.0031
624	SD					N/A	97.5% KM (Chebyshev) UCL					0.00333
625	k star					N/A	99% KM (Chebyshev) UCL					0.00377
626	Theta star					N/A						
627	Nu star					N/A	**Potential UCLs to Use**					
628	AppChi2					N/A	95% KM (t) UCL					0.00281
629	95% Gamma Approximate UCL					N/A	95% KM (% Bootstrap) UCL					N/A
630	95% Adjusted Gamma UCL					N/A						
631	**Warning: Recommended UCL exceeds the maximum observation**											
632	**Note: DL/2 is not a recommended method.**											
633												
634												
635	**Arsenic, dissolved (mw-1)**											
636												

637	**General Statistics**											
638					Number of Valid Observations	2				Number of Distinct Observations	2	
639												
640												
641	**Warning: This data set only has 2 observations!**											
642	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
643	**The data set for variable Arsenic, dissolved (mw-1) was not processed!**											
644												
645	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
646	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
647												
648												
649												
650	**Arsenic, dissolved (mw-10)**											
651												
652	**General Statistics**											
653					Number of Valid Data	14				Number of Detected Data	8	
654					Number of Distinct Detected Data	8				Number of Non-Detect Data	6	
655										Percent Non-Detects	42.86%	
656												
657	**Raw Statistics**							**Log-transformed Statistics**				
658					Minimum Detected	0.00639				Minimum Detected	-5.053	
659					Maximum Detected	0.0143				Maximum Detected	-4.247	
660					Mean of Detected	0.00929				Mean of Detected	-4.708	
661					SD of Detected	0.00252				SD of Detected	0.251	
662					Minimum Non-Detect	0.002				Minimum Non-Detect	-6.215	
663					Maximum Non-Detect	0.01				Maximum Non-Detect	-4.605	
664												
665	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	12	
666	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	2	
667	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	85.71%	
668												
669	**Warning: There are only 8 Detected Values in this data**											
670	**Note: It should be noted that even though bootstrap may be performed on this data set**											
671	**the resulting calculations may not be reliable enough tp draw conclusions**											
672												
673	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
674												
675												
676	**UCL Statistics**											
677	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
678					Shapiro Wilk Test Statistic	0.868				Shapiro Wilk Test Statistic	0.922	
679					5% Shapiro Wilk Critical Value	0.818				5% Shapiro Wilk Critical Value	0.818	
680	**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
681												
682	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
683					DL/2 Substitution Method					DL/2 Substitution Method		
684					Mean	0.00681				Mean	-5.175	
685					SD	0.00366				SD	0.711	
686					95% DL/2 (t) UCL	0.00854				95% H-Stat (DL/2) UCL	0.0116	
687												
688					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
689	**MLE method failed to converge properly**									Mean in Log Scale	-4.883	

690											SD in Log Scale	0.31
691											Mean in Original Scale	0.00793
692											SD in Original Scale	0.00261
693											95% Percentile Bootstrap UCL	0.00912
694											95% BCA Bootstrap UCL	0.00931
695												
696	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
697					k star (bias corrected)	10.96	**Data appear Normal at 5% Significance Level**					
698					Theta Star	0.0008472						
699					nu star	175.4						
700												
701					A-D Test Statistic	0.485	**Nonparametric Statistics**					
702					5% A-D Critical Value	0.716					Kaplan-Meier (KM) Method	
703					K-S Test Statistic	0.716					Mean	0.00828
704					5% K-S Critical Value	0.294					SD	0.00221
705	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0006521
706											95% KM (t) UCL	0.00944
707	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00936
708					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00938
709					Minimum	0.00627					95% KM (bootstrap t) UCL	0.00982
710					Maximum	0.0143					95% KM (BCA) UCL	0.0098
711					Mean	0.00892					95% KM (Percentile Bootstrap) UCL	0.00962
712					Median	0.00825					95% KM (Chebyshev) UCL	0.0111
713					SD	0.00223					97.5% KM (Chebyshev) UCL	0.0124
714					k star	15.16					99% KM (Chebyshev) UCL	0.0148
715					Theta star	0.0005886						
716					Nu star	424.6	**Potential UCLs to Use**					
717					AppChi2	377.8					95% KM (t) UCL	0.00944
718					95% Gamma Approximate UCL	0.01					95% KM (Percentile Bootstrap) UCL	0.00962
719					95% Adjusted Gamma UCL	0.0102						
720	**Note: DL/2 is not a recommended method.**											
721												
722												
723	**Arsenic, dissolved (mw-11)**											
724												
725	**General Statistics**											
726					Number of Valid Data	11					Number of Detected Data	6
727					Number of Distinct Detected Data	5					Number of Non-Detect Data	5
728											Percent Non-Detects	45.45%
729												
730	**Raw Statistics**						**Log-transformed Statistics**					
731					Minimum Detected	0.00153					Minimum Detected	-6.482
732					Maximum Detected	0.00172					Maximum Detected	-6.365
733					Mean of Detected	0.00164					Mean of Detected	-6.412
734					SD of Detected	6.346E-05					SD of Detected	0.0392
735					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
736					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
737												
738	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	11
739	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
740	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
741												
742	**Warning: There are only 6 Detected Values in this data**											

743	**Note: It should be noted that even though bootstrap may be performed on this data set**											
744	**the resulting calculations may not be reliable enough tp draw conclusions**											
745												
746	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
747												
748												
749	**UCL Statistics**											
750	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
751	Shapiro Wilk Test Statistic				0.896		Shapiro Wilk Test Statistic					0.886
752	5% Shapiro Wilk Critical Value				0.788		5% Shapiro Wilk Critical Value					0.788
753	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
754												
755	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
756	DL/2 Substitution Method						DL/2 Substitution Method					
757	Mean				0.00271		Mean					-6.032
758	SD				0.00151		SD					0.499
759	95% DL/2 (t) UCL				0.00354		95% H-Stat (DL/2) UCL					0.0124
760												
761	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
762	**MLE method failed to converge properly**						Mean in Log Scale					-6.412
763							SD in Log Scale					0.0324
764							Mean in Original Scale					0.00164
765							SD in Original Scale					5.264E-05
766							95% Percentile Bootstrap UCL					0.00167
767							95% BCA Bootstrap UCL					0.00167
768												
769	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
770	k star (bias corrected)				394.2		**Data appear Normal at 5% Significance Level**					
771	Theta Star				4.168E-06							
772	nu star				4731							
773												
774	A-D Test Statistic				0.455		**Nonparametric Statistics**					
775	5% A-D Critical Value				0.696		Kaplan-Meier (KM) Method					
776	K-S Test Statistic				0.696		Mean					0.00164
777	5% K-S Critical Value				0.332		SD					5.793E-05
778	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					2.591E-05
779							95% KM (t) UCL					0.00169
780	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00169
781	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00169
782	Minimum				0.00153		95% KM (bootstrap t) UCL					0.00169
783	Maximum				0.00172		95% KM (BCA) UCL					0.00168
784	Mean				0.00165		95% KM (Percentile Bootstrap) UCL					0.00168
785	Median				0.00165		95% KM (Chebyshev) UCL					0.00176
786	SD				5.271E-05		97.5% KM (Chebyshev) UCL					0.00181
787	k star				766.6		99% KM (Chebyshev) UCL					0.0019
788	Theta star				2.147E-06							
789	Nu star				16866		**Potential UCLs to Use**					
790	AppChi2				16565		95% KM (t) UCL					0.00169
791	95% Gamma Approximate UCL				0.00168		95% KM (Percentile Bootstrap) UCL					0.00168
792	95% Adjusted Gamma UCL				0.00168							
793	**Note: DL/2 is not a recommended method.**											
794												
795												

796	**Arsenic, dissolved (mw-12)**											
797												
798	**General Statistics**											
799						Number of Valid Observations	17				Number of Distinct Observations	17
800												
801	**Raw Statistics**							**Log-transformed Statistics**				
802						Minimum	0.052				Minimum of Log Data	-2.957
803						Maximum	0.157				Maximum of Log Data	-1.852
804						Mean	0.0921				Mean of log Data	-2.436
805						Median	0.0819				SD of log Data	0.326
806						SD	0.0318					
807						Coefficient of Variation	0.345					
808						Skewness	0.888					
809												
810	**Relevant UCL Statistics**											
811	**Normal Distribution Test**							**Lognormal Distribution Test**				
812						Shapiro Wilk Test Statistic	0.897				Shapiro Wilk Test Statistic	0.949
813						Shapiro Wilk Critical Value	0.892				Shapiro Wilk Critical Value	0.892
814	**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
815												
816	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
817						95% Student's-t UCL	0.106				95% H-UCL	0.108
818	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.124
819						95% Adjusted-CLT UCL	0.107				97.5% Chebyshev (MVUE) UCL	0.138
820						95% Modified-t UCL	0.106				99% Chebyshev (MVUE) UCL	0.165
821												
822	**Gamma Distribution Test**							**Data Distribution**				
823						k star (bias corrected)	8.13	**Data appear Normal at 5% Significance Level**				
824						Theta Star	0.0113					
825						nu star	276.4					
826						Approximate Chi Square Value (.05)	238.9	**Nonparametric Statistics**				
827						Adjusted Level of Significance	0.0346				95% CLT UCL	0.105
828						Adjusted Chi Square Value	235.3				95% Jackknife UCL	0.106
829											95% Standard Bootstrap UCL	0.105
830						Anderson-Darling Test Statistic	0.484				95% Bootstrap-t UCL	0.109
831						Anderson-Darling 5% Critical Value	0.739				95% Hall's Bootstrap UCL	0.106
832						Kolmogorov-Smirnov Test Statistic	0.152				95% Percentile Bootstrap UCL	0.105
833						Kolmogorov-Smirnov 5% Critical Value	0.209				95% BCA Bootstrap UCL	0.106
834	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.126
835											97.5% Chebyshev(Mean, Sd) UCL	0.14
836	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.169
837						95% Approximate Gamma UCL	0.107					
838						95% Adjusted Gamma UCL	0.108					
839												
840	**Potential UCL to Use**										Use 95% Student's-t UCL	0.106
841												
842												
843	**Arsenic, dissolved (mw-13)**											
844												
845	**General Statistics**											
846						Number of Valid Data	2				Number of Detected Data	1
847						Number of Distinct Detected Data	1				Number of Non-Detect Data	1
848											Percent Non-Detects	50.00%

	A	B	C	D	E	F	G	H	I	J	K	L
849												
850	Warning: This data set only has 2 observations!											
851	Data set is too small to compute reliable and meaningful statistics and estimates!											
852	The data set for variable Arsenic, dissolved (mw-13) was not processed!											
853												
854	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
855	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
856												
857												
858												
859	Arsenic, dissolved (mw-14)											
860												
861	General Statistics											
862	Number of Valid Observations	2				Number of Distinct Observations	2					
863												
864												
865	Warning: This data set only has 2 observations!											
866	Data set is too small to compute reliable and meaningful statistics and estimates!											
867	The data set for variable Arsenic, dissolved (mw-14) was not processed!											
868												
869	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
870	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
871												
872												
873												
874	Arsenic, dissolved (mw-15)											
875												
876	General Statistics											
877	Number of Valid Observations	1				Number of Distinct Observations	1					
878												
879												
880	Warning: This data set only has 1 observations!											
881	Data set is too small to compute reliable and meaningful statistics and estimates!											
882	The data set for variable Arsenic, dissolved (mw-15) was not processed!											
883												
884	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
885	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
886												
887												
888												
889	Arsenic, dissolved (mw-19)											
890												
891	General Statistics											
892	Number of Valid Observations	1				Number of Distinct Observations	1					
893												
894												
895	Warning: This data set only has 1 observations!											
896	Data set is too small to compute reliable and meaningful statistics and estimates!											
897	The data set for variable Arsenic, dissolved (mw-19) was not processed!											
898												
899	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
900	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
901												

902												
903												
904	**Arsenic, dissolved (mw-20-100)**											
905												
906						**General Statistics**						
907					Number of Valid Data	1			Number of Detected Data	0		
908					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
909									Percent Non-Detects	100.00%		
910												
911					**Warning: This data set only has 1 observations!**							
912					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
913					**The data set for variable Arsenic, dissolved (mw-20-100) was not processed!**							
914												
915					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
916					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
917												
918												
919												
920	**Arsenic, dissolved (mw-20-130)**											
921												
922						**General Statistics**						
923					Number of Valid Data	12			Number of Detected Data	9		
924					Number of Distinct Detected Data	9			Number of Non-Detect Data	3		
925									Percent Non-Detects	25.00%		
926												
927					**Raw Statistics**				**Log-transformed Statistics**			
928					Minimum Detected	0.00552			Minimum Detected	-5.199		
929					Maximum Detected	0.00742			Maximum Detected	-4.904		
930					Mean of Detected	0.00622			Mean of Detected	-5.083		
931					SD of Detected	0.0006095			SD of Detected	0.0958		
932					Minimum Non-Detect	0.01			Minimum Non-Detect	-4.605		
933					Maximum Non-Detect	0.01			Maximum Non-Detect	-4.605		
934												
935												
936					**Warning: There are only 9 Detected Values in this data**							
937					**Note: It should be noted that even though bootstrap may be performed on this data set**							
938					**the resulting calculations may not be reliable enough tp draw conclusions**							
939												
940					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
941												
942												
943						**UCL Statistics**						
944					**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**			
945					Shapiro Wilk Test Statistic	0.941			Shapiro Wilk Test Statistic	0.953		
946					5% Shapiro Wilk Critical Value	0.829			5% Shapiro Wilk Critical Value	0.829		
947					**Data appear Normal at 5% Significance Level**				**Data appear Lognormal at 5% Significance Level**			
948												
949					**Assuming Normal Distribution**				**Assuming Lognormal Distribution**			
950					DL/2 Substitution Method				DL/2 Substitution Method			
951					Mean	0.00592			Mean	-5.137		
952					SD	0.0007595			SD	0.127		
953					95% DL/2 (t) UCL	0.00631			95% H-Stat (DL/2) UCL	0.00899		
954												

955					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
956					**MLE method failed to converge properly**						Mean in Log Scale	-5.083
957											SD in Log Scale	0.0881
958											Mean in Original Scale	0.00622
959											SD in Original Scale	0.0005585
960											95% Percentile Bootstrap UCL	0.00647
961											95% BCA Bootstrap UCL	0.0065
962												
963					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
964					k star (bias corrected)	80.8					**Data appear Normal at 5% Significance Level**	
965					Theta Star	7.704E-05						
966					nu star	1454						
967												
968					A-D Test Statistic	0.224					**Nonparametric Statistics**	
969					5% A-D Critical Value	0.72					Kaplan-Meier (KM) Method	
970					K-S Test Statistic	0.72					Mean	0.00622
971					5% K-S Critical Value	0.279					SD	0.0005746
972					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0002032
973											95% KM (t) UCL	0.00659
974					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00656
975					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00659
976					Minimum	0.00552					95% KM (bootstrap t) UCL	0.00671
977					Maximum	0.00742					95% KM (BCA) UCL	0.00657
978					Mean	0.00624					95% KM (Percentile Bootstrap) UCL	0.00656
979					Median	0.00626					95% KM (Chebyshev) UCL	0.00711
980					SD	0.0005543					97.5% KM (Chebyshev) UCL	0.00749
981					k star	106.2					99% KM (Chebyshev) UCL	0.00825
982					Theta star	5.875E-05						
983					Nu star	2548					**Potential UCLs to Use**	
984					AppChi2	2432					95% KM (t) UCL	0.00659
985					95% Gamma Approximate UCL	0.00654					95% KM (Percentile Bootstrap) UCL	0.00656
986					95% Adjusted Gamma UCL	0.00658						
987	**Note: DL/2 is not a recommended method.**											
988												
989												
990	**Arsenic, dissolved (mw-20-70)**											
991												
992						**General Statistics**						
993					Number of Valid Data	13					Number of Detected Data	8
994					Number of Distinct Detected Data	8					Number of Non-Detect Data	5
995											Percent Non-Detects	38.46%
996												
997					**Raw Statistics**						**Log-transformed Statistics**	
998					Minimum Detected	0.00162					Minimum Detected	-6.425
999					Maximum Detected	0.0022					Maximum Detected	-6.119
1000					Mean of Detected	0.00188					Mean of Detected	-6.283
1001					SD of Detected	0.0002002					SD of Detected	0.106
1002					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
1003					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
1004												
1005	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
1006	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1007	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%

	A	B	C	D	E	F	G	H	I	J	K	L
1008												
1009	**Warning: There are only 8 Detected Values in this data**											
1010	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1011	**the resulting calculations may not be reliable enough tp draw conclusions**											
1012												
1013	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1014												
1015												
1016	**UCL Statistics**											
1017	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1018	Shapiro Wilk Test Statistic					0.959	Shapiro Wilk Test Statistic					0.961
1019	5% Shapiro Wilk Critical Value					0.818	5% Shapiro Wilk Critical Value					0.818
1020	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1021												
1022	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1023	DL/2 Substitution Method						DL/2 Substitution Method					
1024	Mean					0.00289	Mean					-5.957
1025	SD					0.00148	SD					0.471
1026	95% DL/2 (t) UCL					0.00362	95% H-Stat (DL/2) UCL					0.00725
1027												
1028	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1029	**MLE method failed to converge properly**						Mean in Log Scale					-6.283
1030							SD in Log Scale					0.0936
1031							Mean in Original Scale					0.00188
1032							SD in Original Scale					0.0001762
1033							95% Percentile Bootstrap UCL					0.00196
1034							95% BCA Bootstrap UCL					0.00196
1035												
1036	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1037	k star (bias corrected)					63.34	**Data appear Normal at 5% Significance Level**					
1038	Theta Star					2.964E-05						
1039	nu star					1013						
1040												
1041	A-D Test Statistic					0.229	**Nonparametric Statistics**					
1042	5% A-D Critical Value					0.715	Kaplan-Meier (KM) Method					
1043	K-S Test Statistic					0.715	Mean					0.00188
1044	5% K-S Critical Value					0.294	SD					0.0001873
1045	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					7.078E-05
1046							95% KM (t) UCL					0.002
1047	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00199
1048	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00201
1049	Minimum					0.00162	95% KM (bootstrap t) UCL					0.00203
1050	Maximum					0.0022	95% KM (BCA) UCL					0.002
1051	Mean					0.00188	95% KM (Percentile Bootstrap) UCL					0.00199
1052	Median					0.00192	95% KM (Chebyshev) UCL					0.00219
1053	SD					0.0001747	97.5% KM (Chebyshev) UCL					0.00232
1054	k star					96.59	99% KM (Chebyshev) UCL					0.00258
1055	Theta star					1.951E-05						
1056	Nu star					2511	**Potential UCLs to Use**					
1057	AppChi2					2396	95% KM (t) UCL					0.002
1058	95% Gamma Approximate UCL					0.00197	95% KM (Percentile Bootstrap) UCL					0.00199
1059	95% Adjusted Gamma UCL					0.00199						
1060	**Note: DL/2 is not a recommended method.**											

	A	B	C	D	E	F	G	H	I	J	K	L
1061												
1062												
1063	**Arsenic, dissolved (mw-21)**											
1064												
1065	**General Statistics**											
1066					Number of Valid Data	4			Number of Detected Data			0
1067					Number of Distinct Detected Data	0			Number of Non-Detect Data			4
1068									Percent Non-Detects			100.00%
1069												
1070	**Warning: This data set only has 4 observations!**											
1071	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1072	**The data set for variable Arsenic, dissolved (mw-21) was not processed!**											
1073												
1074	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1075	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1076												
1077												
1078												
1079	**Arsenic, dissolved (mw-22)**											
1080												
1081	**General Statistics**											
1082					Number of Valid Observations	3			Number of Distinct Observations			3
1083												
1084												
1085	**Warning: This data set only has 3 observations!**											
1086	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1087	**The data set for variable Arsenic, dissolved (mw-22) was not processed!**											
1088												
1089	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1090	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1091												
1092												
1093												
1094	**Arsenic, dissolved (mw-23)**											
1095												
1096	**General Statistics**											
1097					Number of Valid Data	4			Number of Detected Data			0
1098					Number of Distinct Detected Data	0			Number of Non-Detect Data			4
1099									Percent Non-Detects			100.00%
1100												
1101	**Warning: This data set only has 4 observations!**											
1102	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1103	**The data set for variable Arsenic, dissolved (mw-23) was not processed!**											
1104												
1105	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1106	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1107												
1108												
1109												
1110	**Arsenic, dissolved (mw-24a)**											
1111												
1112	**General Statistics**											
1113					Number of Valid Data	4			Number of Detected Data			3

1114				Number of Distinct Detected Data	3				Number of Non-Detect Data	1		
1115									Percent Non-Detects	25.00%		
1116												
1117					**Warning: This data set only has 4 observations!**							
1118					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
1119					**The data set for variable Arsenic, dissolved (mw-24a) was not processed!**							
1120												
1121					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
1122					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
1123												
1124												
1125												
1126	**Arsenic, dissolved (mw-24b)**											
1127												
1128					**General Statistics**							
1129				Number of Valid Observations	2				Number of Distinct Observations	2		
1130												
1131												
1132					**Warning: This data set only has 2 observations!**							
1133					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
1134					**The data set for variable Arsenic, dissolved (mw-24b) was not processed!**							
1135												
1136					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
1137					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
1138												
1139												
1140												
1141	**Arsenic, dissolved (mw-25)**											
1142												
1143					**General Statistics**							
1144				Number of Valid Data	10				Number of Detected Data	6		
1145				Number of Distinct Detected Data	6				Number of Non-Detect Data	4		
1146									Percent Non-Detects	40.00%		
1147												
1148				**Raw Statistics**					**Log-transformed Statistics**			
1149				Minimum Detected	0.00191				Minimum Detected	-6.261		
1150				Maximum Detected	0.00239				Maximum Detected	-6.036		
1151				Mean of Detected	0.0021				Mean of Detected	-6.17		
1152				SD of Detected	0.0001746				SD of Detected	0.0818		
1153				Minimum Non-Detect	0.005				Minimum Non-Detect	-5.298		
1154				Maximum Non-Detect	0.01				Maximum Non-Detect	-4.605		
1155												
1156	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	10		
1157	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	0		
1158	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	100.00%		
1159												
1160					**Warning: There are only 6 Detected Values in this data**							
1161					**Note: It should be noted that even though bootstrap may be performed on this data set**							
1162					**the resulting calculations may not be reliable enough tp draw conclusions**							
1163												
1164					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
1165												
1166												

1167	**UCL Statistics**											
1168	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1169					Shapiro Wilk Test Statistic	0.918					Shapiro Wilk Test Statistic	0.927
1170					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
1171	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1172												
1173	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1174					DL/2 Substitution Method						DL/2 Substitution Method	
1175					Mean	0.00301					Mean	-5.891
1176					SD	0.00139					SD	0.417
1177					95% DL/2 (t) UCL	0.00381					95% H-Stat (DL/2) UCL	0.0135
1178												
1179					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1180	**MLE method failed to converge properly**										Mean in Log Scale	-6.17
1181											SD in Log Scale	0.069
1182											Mean in Original Scale	0.0021
1183											SD in Original Scale	0.0001467
1184											95% Percentile Bootstrap UCL	0.00217
1185											95% BCA Bootstrap UCL	0.00218
1186												
1187	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1188					k star (bias corrected)	88.82	**Data appear Normal at 5% Significance Level**					
1189					Theta Star	2.361E-05						
1190					nu star	1066						
1191												
1192					A-D Test Statistic	0.318	**Nonparametric Statistics**					
1193					5% A-D Critical Value	0.696					Kaplan-Meier (KM) Method	
1194					K-S Test Statistic	0.696					Mean	0.0021
1195					5% K-S Critical Value	0.332					SD	0.0001593
1196	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	7.126E-05
1197											95% KM (t) UCL	0.00223
1198	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00221
1199					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00223
1200					Minimum	0.00191					95% KM (bootstrap t) UCL	0.00228
1201					Maximum	0.00239					95% KM (BCA) UCL	0.00221
1202					Mean	0.0021					95% KM (Percentile Bootstrap) UCL	0.00221
1203					Median	0.00212					95% KM (Chebyshev) UCL	0.00241
1204					SD	0.0001455					97.5% KM (Chebyshev) UCL	0.00254
1205					k star	164.7					99% KM (Chebyshev) UCL	0.00281
1206					Theta star	1.277E-05						
1207					Nu star	3295	**Potential UCLs to Use**					
1208					AppChi2	3162					95% KM (t) UCL	0.00223
1209					95% Gamma Approximate UCL	0.00219					95% KM (Percentile Bootstrap) UCL	0.00221
1210					95% Adjusted Gamma UCL	0.00221						
1211	**Note: DL/2 is not a recommended method.**											
1212												
1213												
1214	**Arsenic, dissolved (mw-26)**											
1215												
1216	**General Statistics**											
1217					Number of Valid Data	3					Number of Detected Data	0
1218					Number of Distinct Detected Data	0					Number of Non-Detect Data	3
1219											Percent Non-Detects	100.00%

	A	B	C	D	E	F	G	H	I	J	K	L
1220												
1221	Warning: This data set only has 3 observations!											
1222	Data set is too small to compute reliable and meaningful statistics and estimates!											
1223	The data set for variable Arsenic, dissolved (mw-26) was not processed!											
1224												
1225	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1226	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1227												
1228												
1229												
1230	Arsenic, dissolved (mw-3)											
1231												
1232	General Statistics											
1233	Number of Valid Observations	2				Number of Distinct Observations	2					
1234												
1235												
1236	Warning: This data set only has 2 observations!											
1237	Data set is too small to compute reliable and meaningful statistics and estimates!											
1238	The data set for variable Arsenic, dissolved (mw-3) was not processed!											
1239												
1240	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1241	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1242												
1243												
1244												
1245	Arsenic, dissolved (mw-30-30)											
1246												
1247	General Statistics											
1248	Number of Valid Data	1				Number of Detected Data	0					
1249	Number of Distinct Detected Data	0				Number of Non-Detect Data	1					
1250						Percent Non-Detects	100.00%					
1251												
1252	Warning: This data set only has 1 observations!											
1253	Data set is too small to compute reliable and meaningful statistics and estimates!											
1254	The data set for variable Arsenic, dissolved (mw-30-30) was not processed!											
1255												
1256	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1257	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1258												
1259												
1260												
1261	Arsenic, dissolved (mw-31-135)											
1262												
1263	General Statistics											
1264	Number of Valid Observations	1				Number of Distinct Observations	1					
1265												
1266												
1267	Warning: This data set only has 1 observations!											
1268	Data set is too small to compute reliable and meaningful statistics and estimates!											
1269	The data set for variable Arsenic, dissolved (mw-31-135) was not processed!											
1270												
1271	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1272	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											

	A	B	C	D	E	F	G	H	I	J	K	L
1273												
1274												
1275												
1276	**Arsenic, dissolved (mw-31-60)**											
1277												
1278	**General Statistics**											
1279					Number of Valid Data	2			Number of Detected Data			1
1280					Number of Distinct Detected Data	1			Number of Non-Detect Data			1
1281									Percent Non-Detects			50.00%
1282												
1283	**Warning: This data set only has 2 observations!**											
1284	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1285	**The data set for variable Arsenic, dissolved (mw-31-60) was not processed!**											
1286												
1287	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1288	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1289												
1290												
1291												
1292	**Arsenic, dissolved (mw-32-35)**											
1293												
1294	**General Statistics**											
1295					Number of Valid Data	3			Number of Detected Data			2
1296					Number of Distinct Detected Data	2			Number of Non-Detect Data			1
1297									Percent Non-Detects			33.33%
1298												
1299	**Warning: This data set only has 3 observations!**											
1300	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1301	**The data set for variable Arsenic, dissolved (mw-32-35) was not processed!**											
1302												
1303	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1304	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1305												
1306												
1307												
1308	**Arsenic, dissolved (mw-33-210)**											
1309												
1310	**General Statistics**											
1311					Number of Valid Observations	1			Number of Distinct Observations			1
1312												
1313												
1314	**Warning: This data set only has 1 observations!**											
1315	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1316	**The data set for variable Arsenic, dissolved (mw-33-210) was not processed!**											
1317												
1318	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1319	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1320												
1321												
1322												
1323	**Arsenic, dissolved (mw-33-90)**											
1324												
1325	**General Statistics**											

1326	Number of Valid Observations	1					Number of Distinct Observations	1				
1327												
1328												
1329	**Warning: This data set only has 1 observations!**											
1330	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1331	**The data set for variable Arsenic, dissolved (mw-33-90) was not processed!**											
1332												
1333	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1334	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1335												
1336												
1337												
1338	**Arsenic, dissolved (mw-34-100)**											
1339												
1340	**General Statistics**											
1341	Number of Valid Observations	2					Number of Distinct Observations	2				
1342												
1343												
1344	**Warning: This data set only has 2 observations!**											
1345	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1346	**The data set for variable Arsenic, dissolved (mw-34-100) was not processed!**											
1347												
1348	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1349	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1350												
1351												
1352												
1353	**Arsenic, dissolved (mw-34-55)**											
1354												
1355	**General Statistics**											
1356	Number of Valid Data	9					Number of Detected Data	4				
1357	Number of Distinct Detected Data	4					Number of Non-Detect Data	5				
1358							Percent Non-Detects	55.56%				
1359												
1360	**Raw Statistics**						**Log-transformed Statistics**					
1361	Minimum Detected	0.00201					Minimum Detected	-6.21				
1362	Maximum Detected	0.00483					Maximum Detected	-5.333				
1363	Mean of Detected	0.00284					Mean of Detected	-5.934				
1364	SD of Detected	0.00134					SD of Detected	0.409				
1365	Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298				
1366	Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605				
1367												
1368	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	9				
1369	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	0				
1370	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	100.00%				
1371												
1372	**Warning: There are only 4 Distinct Detected Values in this data**											
1373	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1374	**the resulting calculations may not be reliable enough tp draw conclusions**											
1375												
1376	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1377												
1378												

	A	B	C	D	E	F	G	H	I	J	K	L
1379	**UCL Statistics**											
1380	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1381					Shapiro Wilk Test Statistic	0.739					Shapiro Wilk Test Statistic	0.786
1382					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
1383	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1384												
1385	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1386					DL/2 Substitution Method						DL/2 Substitution Method	
1387					Mean	0.00376					Mean	-5.658
1388					SD	0.00144					SD	0.424
1389					95% DL/2 (t) UCL	0.00465					95% H-Stat (DL/2) UCL	0.00978
1390												
1391					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1392	**MLE method failed to converge properly**										Mean in Log Scale	-5.934
1393											SD in Log Scale	0.334
1394											Mean in Original Scale	0.00279
1395											SD in Original Scale	0.00102
1396											95% Percentile Bootstrap UCL	0.00336
1397											95% BCA Bootstrap UCL	0.00346
1398												
1399	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1400					k star (bias corrected)	2.003	**Data appear Gamma Distributed at 5% Significance Level**					
1401					Theta Star	0.00142						
1402					nu star	16.02						
1403												
1404					A-D Test Statistic	0.626	**Nonparametric Statistics**					
1405					5% A-D Critical Value	0.658					Kaplan-Meier (KM) Method	
1406					K-S Test Statistic	0.658					Mean	0.00284
1407					5% K-S Critical Value	0.395					SD	0.00116
1408	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0006705
1409											95% KM (t) UCL	0.00408
1410	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00394
1411					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00419
1412					Minimum	0.0015					95% KM (bootstrap t) UCL	0.00913
1413					Maximum	0.00483					95% KM (BCA) UCL	0.00413
1414					Mean	0.00285					95% KM (Percentile Bootstrap) UCL	0.00403
1415					Median	0.0025					95% KM (Chebyshev) UCL	0.00576
1416					SD	0.00106					97.5% KM (Chebyshev) UCL	0.00702
1417					k star	5.799					99% KM (Chebyshev) UCL	0.00951
1418					Theta star	0.0004909						
1419					Nu star	104.4	**Potential UCLs to Use**					
1420					AppChi2	81.8					95% KM (t) UCL	0.00408
1421					95% Gamma Approximate UCL	0.00363						
1422					95% Adjusted Gamma UCL	N/A						
1423	**Note: DL/2 is not a recommended method.**											
1424												
1425												
1426	**Arsenic, dissolved (mw-34-80)**											
1427												
1428	**General Statistics**											
1429					Number of Valid Data	13					Number of Detected Data	8
1430					Number of Distinct Detected Data	8					Number of Non-Detect Data	5
1431											Percent Non-Detects	38.46%

1432												
1433	**Raw Statistics**						**Log-transformed Statistics**					
1434					Minimum Detected	0.0013					Minimum Detected	-6.645
1435					Maximum Detected	0.00219					Maximum Detected	-6.124
1436					Mean of Detected	0.0018					Mean of Detected	-6.338
1437					SD of Detected	0.0003275					SD of Detected	0.192
1438					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
1439					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
1440												
1441	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
1442	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1443	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1444												
1445	**Warning: There are only 8 Detected Values in this data**											
1446	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1447	**the resulting calculations may not be reliable enough tp draw conclusions**											
1448												
1449	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1450												
1451												
1452	**UCL Statistics**											
1453	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1454					Shapiro Wilk Test Statistic	0.929					Shapiro Wilk Test Statistic	0.911
1455					5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818
1456	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1457												
1458	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1459					DL/2 Substitution Method						DL/2 Substitution Method	
1460					Mean	0.00284					Mean	-5.991
1461					SD	0.00153					SD	0.511
1462					95% DL/2 (t) UCL	0.00359					95% H-Stat (DL/2) UCL	0.00601
1463												
1464					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1465	**MLE method failed to converge properly**										Mean in Log Scale	-6.338
1466											SD in Log Scale	0.168
1467											Mean in Original Scale	0.00179
1468											SD in Original Scale	0.0002903
1469											95% Percentile Bootstrap UCL	0.00192
1470											95% BCA Bootstrap UCL	0.00192
1471												
1472	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1473					k star (bias corrected)	20.24	**Data appear Normal at 5% Significance Level**					
1474					Theta Star	8.874E-05						
1475					nu star	323.9						
1476												
1477					A-D Test Statistic	0.351	**Nonparametric Statistics**					
1478					5% A-D Critical Value	0.716					Kaplan-Meier (KM) Method	
1479					K-S Test Statistic	0.716					Mean	0.0018
1480					5% K-S Critical Value	0.294					SD	0.0003064
1481	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0001158
1482											95% KM (t) UCL	0.002
1483	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00199
1484					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00201

1485					Minimum	0.0013				95% KM (bootstrap t) UCL		0.002
1486					Maximum	0.00219				95% KM (BCA) UCL		0.00196
1487					Mean	0.00181				95% KM (Percentile Bootstrap) UCL		0.00198
1488					Median	0.00186				95% KM (Chebyshev) UCL		0.0023
1489					SD	0.0002889				97.5% KM (Chebyshev) UCL		0.00252
1490					k star	30.57				99% KM (Chebyshev) UCL		0.00295
1491					Theta star	5.911E-05						
1492					Nu star	794.8				**Potential UCLs to Use**		
1493					AppChi2	730.4				95% KM (t) UCL		0.002
1494					95% Gamma Approximate UCL	0.00197				95% KM (Percentile Bootstrap) UCL		0.00198
1495					95% Adjusted Gamma UCL	0.00199						
1496	**Note: DL/2 is not a recommended method.**											
1497												
1498												
1499	**Arsenic, dissolved (mw-35-135)**											
1500												
1501	**General Statistics**											
1502					Number of Valid Observations	2				Number of Distinct Observations		2
1503												
1504												
1505	**Warning: This data set only has 2 observations!**											
1506	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1507	**The data set for variable Arsenic, dissolved (mw-35-135) was not processed!**											
1508												
1509	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1510	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1511												
1512												
1513												
1514	**Arsenic, dissolved (mw-35-60)**											
1515												
1516	**General Statistics**											
1517					Number of Valid Observations	1				Number of Distinct Observations		1
1518												
1519												
1520	**Warning: This data set only has 1 observations!**											
1521	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1522	**The data set for variable Arsenic, dissolved (mw-35-60) was not processed!**											
1523												
1524	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1525	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1526												
1527												
1528												
1529	**Arsenic, dissolved (mw-37d)**											
1530												
1531	**General Statistics**											
1532					Number of Valid Data	13				Number of Detected Data		8
1533					Number of Distinct Detected Data	7				Number of Non-Detect Data		5
1534										Percent Non-Detects		38.46%
1535												
1536	**Raw Statistics**									**Log-transformed Statistics**		
1537					Minimum Detected	0.00317				Minimum Detected		-5.754

1538				Maximum Detected	0.00397					Maximum Detected	-5.529	
1539				Mean of Detected	0.00353					Mean of Detected	-5.649	
1540				SD of Detected	0.0002859					SD of Detected	0.0811	
1541				Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298	
1542				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
1543												
1544	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	13	
1545	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1546	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1547												
1548	**Warning: There are only 8 Detected Values in this data**											
1549	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1550	**the resulting calculations may not be reliable enough tp draw conclusions**											
1551												
1552	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1553												
1554												
1555	**UCL Statistics**											
1556	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
1557				Shapiro Wilk Test Statistic	0.945					Shapiro Wilk Test Statistic	0.941	
1558				5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818	
1559	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
1560												
1561	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
1562				DL/2 Substitution Method						DL/2 Substitution Method		
1563				Mean	0.0039					Mean	-5.567	
1564				SD	0.0008396					SD	0.218	
1565				95% DL/2 (t) UCL	0.00432					95% H-Stat (DL/2) UCL	0.0089	
1566												
1567				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1568	**MLE method failed to converge properly**									Mean in Log Scale	-5.649	
1569										SD in Log Scale	0.0713	
1570										Mean in Original Scale	0.00353	
1571										SD in Original Scale	0.0002515	
1572										95% Percentile Bootstrap UCL	0.00364	
1573										95% BCA Bootstrap UCL	0.00364	
1574												
1575	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
1576				k star (bias corrected)	108.9					**Data appear Normal at 5% Significance Level**		
1577				Theta Star	3.242E-05							
1578				nu star	1743							
1579												
1580				A-D Test Statistic	0.272					**Nonparametric Statistics**		
1581				5% A-D Critical Value	0.715					Kaplan-Meier (KM) Method		
1582				K-S Test Statistic	0.715					Mean	0.00353	
1583				5% K-S Critical Value	0.294					SD	0.0002674	
1584	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.0001011	
1585										95% KM (t) UCL	0.00371	
1586	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0037	
1587				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00372	
1588				Minimum	0.00317					95% KM (bootstrap t) UCL	0.00372	
1589				Maximum	0.00397					95% KM (BCA) UCL	0.00369	
1590				Mean	0.00354					95% KM (Percentile Bootstrap) UCL	0.00369	

1591					Median	0.00359				95% KM (Chebyshev) UCL		0.00397
1592					SD	0.0002495				97.5% KM (Chebyshev) UCL		0.00416
1593					k star	166.5				99% KM (Chebyshev) UCL		0.00454
1594					Theta star	2.126E-05						
1595					Nu star	4330				**Potential UCLs to Use**		
1596					AppChi2	4178				95% KM (t) UCL		0.00371
1597				95% Gamma Approximate UCL		0.00367				95% KM (Percentile Bootstrap) UCL		0.00369
1598				95% Adjusted Gamma UCL		0.00369						
1599	**Note: DL/2 is not a recommended method.**											
1600												
1601												
1602	**Arsenic, dissolved (mw-37s)**											
1603												
1604	**General Statistics**											
1605				Number of Valid Observations		1				Number of Distinct Observations		1
1606												
1607												
1608	**Warning: This data set only has 1 observations!**											
1609	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1610	**The data set for variable Arsenic, dissolved (mw-37s) was not processed!**											
1611												
1612	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1613	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1614												
1615												
1616												
1617	**Arsenic, dissolved (mw-38d)**											
1618												
1619	**General Statistics**											
1620				Number of Valid Observations		2				Number of Distinct Observations		2
1621												
1622												
1623	**Warning: This data set only has 2 observations!**											
1624	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1625	**The data set for variable Arsenic, dissolved (mw-38d) was not processed!**											
1626												
1627	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1628	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1629												
1630												
1631												
1632	**Arsenic, dissolved (mw-38s)**											
1633												
1634	**General Statistics**											
1635				Number of Valid Data		2				Number of Detected Data		1
1636				Number of Distinct Detected Data		1				Number of Non-Detect Data		1
1637										Percent Non-Detects		50.00%
1638												
1639	**Warning: This data set only has 2 observations!**											
1640	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1641	**The data set for variable Arsenic, dissolved (mw-38s) was not processed!**											
1642												
1643	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											

	A	B	C	D	E	F	G	H	I	J	K	L
1644	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1645												
1646												
1647												
1648	Arsenic, dissolved (mw-39-60)											
1649												
1650	General Statistics											
1651	Number of Valid Observations					1	Number of Distinct Observations					1
1652												
1653												
1654	Warning: This data set only has 1 observations!											
1655	Data set is too small to compute reliable and meaningful statistics and estimates!											
1656	The data set for variable Arsenic, dissolved (mw-39-60) was not processed!											
1657												
1658	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1659	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1660												
1661												
1662												
1663	Arsenic, dissolved (mw-4)											
1664												
1665	General Statistics											
1666	Number of Valid Observations					2	Number of Distinct Observations					2
1667												
1668												
1669	Warning: This data set only has 2 observations!											
1670	Data set is too small to compute reliable and meaningful statistics and estimates!											
1671	The data set for variable Arsenic, dissolved (mw-4) was not processed!											
1672												
1673	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1674	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1675												
1676												
1677												
1678	Arsenic, dissolved (mw-40d)											
1679												
1680	General Statistics											
1681	Number of Valid Observations					1	Number of Distinct Observations					1
1682												
1683												
1684	Warning: This data set only has 1 observations!											
1685	Data set is too small to compute reliable and meaningful statistics and estimates!											
1686	The data set for variable Arsenic, dissolved (mw-40d) was not processed!											
1687												
1688	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1689	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1690												
1691												
1692												
1693	Arsenic, dissolved (mw-40s)											
1694												
1695	General Statistics											
1696	Number of Valid Observations					1	Number of Distinct Observations					1

	A	B	C	D	E	F	G	H	I	J	K	L
1697												
1698												
1699	Warning: This data set only has 1 observations!											
1700	Data set is too small to compute reliable and meaningful statistics and estimates!											
1701	The data set for variable Arsenic, dissolved (mw-40s) was not processed!											
1702												
1703	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1704	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1705												
1706												
1707												
1708	Arsenic, dissolved (mw-43-25)											
1709												
1710	General Statistics											
1711	Number of Valid Observations	3				Number of Distinct Observations	3					
1712												
1713												
1714	Warning: This data set only has 3 observations!											
1715	Data set is too small to compute reliable and meaningful statistics and estimates!											
1716	The data set for variable Arsenic, dissolved (mw-43-25) was not processed!											
1717												
1718	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1719	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1720												
1721												
1722												
1723	Arsenic, dissolved (mw-44-115)											
1724												
1725	General Statistics											
1726	Number of Valid Data	3				Number of Detected Data	2					
1727	Number of Distinct Detected Data	2				Number of Non-Detect Data	1					
1728						Percent Non-Detects	33.33%					
1729												
1730	Warning: This data set only has 3 observations!											
1731	Data set is too small to compute reliable and meaningful statistics and estimates!											
1732	The data set for variable Arsenic, dissolved (mw-44-115) was not processed!											
1733												
1734	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1735	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1736												
1737												
1738												
1739	Arsenic, dissolved (mw-44-125)											
1740												
1741	General Statistics											
1742	Number of Valid Observations	1				Number of Distinct Observations	1					
1743												
1744												
1745	Warning: This data set only has 1 observations!											
1746	Data set is too small to compute reliable and meaningful statistics and estimates!											
1747	The data set for variable Arsenic, dissolved (mw-44-125) was not processed!											
1748												
1749	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											

	A	B	C	D	E	F	G	H	I	J	K	L
1750	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1751												
1752												
1753												
1754	Arsenic, dissolved (mw-45-095a)											
1755												
1756	General Statistics											
1757					Number of Valid Observations	1			Number of Distinct Observations	1		
1758												
1759												
1760	Warning: This data set only has 1 observations!											
1761	Data set is too small to compute reliable and meaningful statistics and estimates!											
1762	The data set for variable Arsenic, dissolved (mw-45-095a) was not processed!											
1763												
1764	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1765	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1766												
1767												
1768												
1769	Arsenic, dissolved (mw-46-175)											
1770												
1771	General Statistics											
1772					Number of Valid Observations	1			Number of Distinct Observations	1		
1773												
1774												
1775	Warning: This data set only has 1 observations!											
1776	Data set is too small to compute reliable and meaningful statistics and estimates!											
1777	The data set for variable Arsenic, dissolved (mw-46-175) was not processed!											
1778												
1779	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1780	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1781												
1782												
1783												
1784	Arsenic, dissolved (mw-47-55)											
1785												
1786	General Statistics											
1787					Number of Valid Observations	1			Number of Distinct Observations	1		
1788												
1789												
1790	Warning: This data set only has 1 observations!											
1791	Data set is too small to compute reliable and meaningful statistics and estimates!											
1792	The data set for variable Arsenic, dissolved (mw-47-55) was not processed!											
1793												
1794	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1795	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1796												
1797												
1798												
1799	Arsenic, dissolved (mw-48)											
1800												
1801	General Statistics											
1802					Number of Valid Data	3			Number of Detected Data	0		

1803			Number of Distinct Detected Data		0			Number of Non-Detect Data			3	
1804								Percent Non-Detects			100.00%	
1805												
1806					Warning: This data set only has 3 observations!							
1807					Data set is too small to compute reliable and meaningful statistics and estimates!							
1808					The data set for variable Arsenic, dissolved (mw-48) was not processed!							
1809												
1810					It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
1811					If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
1812												
1813												
1814												
1815	Arsenic, dissolved (mw-5)											
1816												
1817					General Statistics							
1818			Number of Valid Observations		2			Number of Distinct Observations			2	
1819												
1820												
1821					Warning: This data set only has 2 observations!							
1822					Data set is too small to compute reliable and meaningful statistics and estimates!							
1823					The data set for variable Arsenic, dissolved (mw-5) was not processed!							
1824												
1825					It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
1826					If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
1827												
1828												
1829												
1830	Arsenic, dissolved (mw-50-200)											
1831												
1832					General Statistics							
1833			Number of Valid Data		3			Number of Detected Data			0	
1834			Number of Distinct Detected Data		0			Number of Non-Detect Data			3	
1835								Percent Non-Detects			100.00%	
1836												
1837					Warning: This data set only has 3 observations!							
1838					Data set is too small to compute reliable and meaningful statistics and estimates!							
1839					The data set for variable Arsenic, dissolved (mw-50-200) was not processed!							
1840												
1841					It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
1842					If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
1843												
1844												
1845												
1846	Arsenic, dissolved (mw-51)											
1847												
1848					General Statistics							
1849			Number of Valid Data		3			Number of Detected Data			0	
1850			Number of Distinct Detected Data		0			Number of Non-Detect Data			3	
1851								Percent Non-Detects			100.00%	
1852												
1853					Warning: This data set only has 3 observations!							
1854					Data set is too small to compute reliable and meaningful statistics and estimates!							
1855					The data set for variable Arsenic, dissolved (mw-51) was not processed!							

	A	B	C	D	E	F	G	H	I	J	K	L
1856												
1857	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1858	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1859												
1860												
1861												
1862	Arsenic, dissolved (mw-6)											
1863												
1864	General Statistics											
1865	Number of Valid Observations	2				Number of Distinct Observations	2					
1866												
1867												
1868	Warning: This data set only has 2 observations!											
1869	Data set is too small to compute reliable and meaningful statistics and estimates!											
1870	The data set for variable Arsenic, dissolved (mw-6) was not processed!											
1871												
1872	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1873	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1874												
1875												
1876												
1877	Arsenic, dissolved (mw-7)											
1878												
1879	General Statistics											
1880	Number of Valid Observations	2				Number of Distinct Observations	2					
1881												
1882												
1883	Warning: This data set only has 2 observations!											
1884	Data set is too small to compute reliable and meaningful statistics and estimates!											
1885	The data set for variable Arsenic, dissolved (mw-7) was not processed!											
1886												
1887	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1888	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1889												
1890												
1891												
1892	Arsenic, dissolved (mw-8)											
1893												
1894	General Statistics											
1895	Number of Valid Observations	2				Number of Distinct Observations	2					
1896												
1897												
1898	Warning: This data set only has 2 observations!											
1899	Data set is too small to compute reliable and meaningful statistics and estimates!											
1900	The data set for variable Arsenic, dissolved (mw-8) was not processed!											
1901												
1902	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1903	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1904												
1905												
1906												
1907	Arsenic, dissolved (mw-9)											
1908												

1909	**General Statistics**											
1910					Number of Valid Data	2			Number of Detected Data			1
1911					Number of Distinct Detected Data	1			Number of Non-Detect Data			1
1912									Percent Non-Detects			50.00%
1913												
1914	**Warning: This data set only has 2 observations!**											
1915	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1916	**The data set for variable Arsenic, dissolved (mw-9) was not processed!**											
1917												
1918	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1919	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1920												
1921												
1922												
1923	**Arsenic, dissolved (ow-1d)**											
1924												
1925	**General Statistics**											
1926					Number of Valid Data	15			Number of Detected Data			3
1927					Number of Distinct Detected Data	2			Number of Non-Detect Data			12
1928									Percent Non-Detects			80.00%
1929												
1930				**Raw Statistics**					**Log-transformed Statistics**			
1931					Minimum Detected	0.00236			Minimum Detected			-6.049
1932					Maximum Detected	0.00477			Maximum Detected			-5.345
1933					Mean of Detected	0.00316			Mean of Detected			-5.815
1934					SD of Detected	0.00139			SD of Detected			0.406
1935					Minimum Non-Detect	0.005			Minimum Non-Detect			-5.298
1936					Maximum Non-Detect	0.01			Maximum Non-Detect			-4.605
1937												
1938	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			15
1939	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			0
1940	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
1941												
1942	**Warning: Data set has only 2 Distinct Detected Values.**											
1943	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
1944	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1945												
1946	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
1947												
1948	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1949	**Those methods will return a 'N/A' value on your output display!**											
1950												
1951	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1952	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1953												
1954												
1955	**UCL Statistics**											
1956	**Normal Distribution Test with Detected Values Only**								**Lognormal Distribution Test with Detected Values Only**			
1957					Shapiro Wilk Test Statistic	0.75			Shapiro Wilk Test Statistic			0.75
1958					5% Shapiro Wilk Critical Value	0.767			5% Shapiro Wilk Critical Value			0.767
1959	**Data not Normal at 5% Significance Level**								**Data not Lognormal at 5% Significance Level**			
1960												
1961	**Assuming Normal Distribution**								**Assuming Lognormal Distribution**			

1962				DL/2 Substitution Method						DL/2 Substitution Method		
1963				Mean	0.00347					Mean		-5.725
1964				SD	0.00127					SD		0.355
1965				95% DL/2 (t) UCL	0.00404					95% H-Stat (DL/2) UCL		0.00547
1966												
1967				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1968				**MLE method failed to converge properly**						Mean in Log Scale		-5.815
1969										SD in Log Scale		0.374
1970										Mean in Original Scale		0.00319
1971										SD in Original Scale		0.0012
1972										95% Percentile Bootstrap UCL		0.00369
1973										95% BCA Bootstrap UCL		0.00371
1974												
1975				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1976				k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**		
1977				Theta Star	N/A							
1978				nu star	N/A							
1979												
1980				A-D Test Statistic	0.62					**Nonparametric Statistics**		
1981				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
1982				K-S Test Statistic	N/A					Mean		0.00316
1983				5% K-S Critical Value	N/A					SD		0.00114
1984				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.0008033
1985										95% KM (t) UCL		0.00458
1986				**Assuming Gamma Distribution**						95% KM (z) UCL		0.00448
1987				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00484
1988				Minimum	N/A					95% KM (bootstrap t) UCL		1.8E+308
1989				Maximum	N/A					95% KM (BCA) UCL		0.00477
1990				Mean	N/A					95% KM (Percentile Bootstrap) UCL		0.00477
1991				Median	N/A					95% KM (Chebyshev) UCL		0.00666
1992				SD	N/A					97.5% KM (Chebyshev) UCL		0.00818
1993				k star	N/A					99% KM (Chebyshev) UCL		0.0112
1994				Theta star	N/A							
1995				Nu star	N/A					**Potential UCLs to Use**		
1996				AppChi2	N/A					95% KM (t) UCL		0.00458
1997				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL		0.00477
1998				95% Adjusted Gamma UCL	N/A							
1999	**Note: DL/2 is not a recommended method.**											
2000												
2001												
2002	**Arsenic, dissolved (ow-1m)**											
2003												
2004					**General Statistics**							
2005				Number of Valid Data	14					Number of Detected Data		3
2006				Number of Distinct Detected Data	3					Number of Non-Detect Data		11
2007										Percent Non-Detects		78.57%
2008												
2009				**Raw Statistics**						**Log-transformed Statistics**		
2010				Minimum Detected	0.00122					Minimum Detected		-6.709
2011				Maximum Detected	0.00269					Maximum Detected		-5.918
2012				Mean of Detected	0.00177					Mean of Detected		-6.397
2013				SD of Detected	0.0007995					SD of Detected		0.421
2014				Minimum Non-Detect	0.005					Minimum Non-Detect		-5.298

2015					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
2016												
2017	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	14
2018	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
2019	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
2020												
2021	**Warning: There are only 3 Distinct Detected Values in this data set**											
2022	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2023	**Those methods will return a 'N/A' value on your output display!**											
2024												
2025	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2026	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2027												
2028												
2029	**UCL Statistics**											
2030	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2031	Shapiro Wilk Test Statistic					0.845	Shapiro Wilk Test Statistic					0.882
2032	5% Shapiro Wilk Critical Value					0.767	5% Shapiro Wilk Critical Value					0.767
2033	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2034												
2035	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2036	DL/2 Substitution Method						DL/2 Substitution Method					
2037	Mean					0.00306	Mean					-5.88
2038	SD					0.00134	SD					0.447
2039	95% DL/2 (t) UCL					0.00369	95% H-Stat (DL/2) UCL					0.00656
2040												
2041	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2042	**MLE method failed to converge properly**						Mean in Log Scale					-6.397
2043							SD in Log Scale					0.409
2044							Mean in Original Scale					0.0018
2045							SD in Original Scale					0.0007402
2046							95% Percentile Bootstrap UCL					0.00212
2047							95% BCA Bootstrap UCL					0.00215
2048												
2049	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2050	k star (bias corrected)					N/A	**Data appear Normal at 5% Significance Level**					
2051	Theta Star					N/A						
2052	nu star					N/A						
2053												
2054	A-D Test Statistic					0.435	**Nonparametric Statistics**					
2055	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
2056	K-S Test Statistic					N/A	Mean					0.00177
2057	5% K-S Critical Value					N/A	SD					0.0006528
2058	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0004616
2059							95% KM (t) UCL					0.00259
2060	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00253
2061	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00274
2062	Minimum					N/A	95% KM (bootstrap t) UCL					0.00669
2063	Maximum					N/A	95% KM (BCA) UCL					0.00269
2064	Mean					N/A	95% KM (Percentile Bootstrap) UCL					0.00269
2065	Median					N/A	95% KM (Chebyshev) UCL					0.00379
2066	SD					N/A	97.5% KM (Chebyshev) UCL					0.00466
2067	k star					N/A	99% KM (Chebyshev) UCL					0.00637

2068					Theta star	N/A						
2069					Nu star	N/A	**Potential UCLs to Use**					
2070					AppChi2	N/A					95% KM (t) UCL	0.00259
2071				95% Gamma Approximate UCL		N/A					95% KM (Percentile Bootstrap) UCL	0.00269
2072				95% Adjusted Gamma UCL		N/A						
2073	**Note: DL/2 is not a recommended method.**											
2074												
2075												
2076	**Arsenic, dissolved (ow-1s)**											
2077												
2078	**General Statistics**											
2079					Number of Valid Data	13					Number of Detected Data	2
2080					Number of Distinct Detected Data	2					Number of Non-Detect Data	11
2081											Percent Non-Detects	84.62%
2082												
2083	**Raw Statistics**						**Log-transformed Statistics**					
2084					Minimum Detected	0.00114					Minimum Detected	-6.777
2085					Maximum Detected	0.00132					Maximum Detected	-6.63
2086					Mean of Detected	0.00123					Mean of Detected	-6.703
2087					SD of Detected	0.0001273					SD of Detected	0.104
2088					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
2089					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
2090												
2091	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
2092	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
2093	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
2094												
2095	**Warning: Data set has only 2 Distinct Detected Values.**											
2096	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
2097	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2098												
2099	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
2100												
2101	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2102	**Those methods will return a 'N/A' value on your output display!**											
2103												
2104	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2105	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2106												
2107												
2108	**UCL Statistics**											
2109	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2110					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
2111					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
2112	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2113												
2114	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2115					DL/2 Substitution Method						DL/2 Substitution Method	
2116					Mean	0.00307					Mean	-5.888
2117					SD	0.00141					SD	0.484
2118					95% DL/2 (t) UCL	0.00377					95% H-Stat (DL/2) UCL	0.00682
2119												
2120					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	

2121	MLE method failed to converge properly									Mean in Log Scale		N/A
2122										SD in Log Scale		N/A
2123										Mean in Original Scale		N/A
2124										SD in Original Scale		N/A
2125										95% Percentile Bootstrap UCL		N/A
2126										95% BCA Bootstrap UCL		N/A
2127												
2128	Gamma Distribution Test with Detected Values Only									Data Distribution Test with Detected Values Only		
2129				k star (bias corrected)		N/A				Data do not follow a Discernable Distribution (0.05)		
2130				Theta Star		N/A						
2131				nu star		N/A						
2132												
2133				A-D Test Statistic		0.359				Nonparametric Statistics		
2134				5% A-D Critical Value		N/A				Kaplan-Meier (KM) Method		
2135				K-S Test Statistic		N/A				Mean		0.00123
2136				5% K-S Critical Value		N/A				SD		0.00009
2137	Data not Gamma Distributed at 5% Significance Level									SE of Mean		0.00009
2138										95% KM (t) UCL		0.00139
2139	Assuming Gamma Distribution									95% KM (z) UCL		0.00138
2140				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00145
2141				Minimum		N/A				95% KM (bootstrap t) UCL		0.00137
2142				Maximum		N/A				95% KM (BCA) UCL		N/A
2143				Mean		N/A				95% KM (Percentile Bootstrap) UCL		0.00132
2144				Median		N/A				95% KM (Chebyshev) UCL		0.00162
2145				SD		N/A				97.5% KM (Chebyshev) UCL		0.00179
2146				k star		N/A				99% KM (Chebyshev) UCL		0.00213
2147				Theta star		N/A						
2148				Nu star		N/A				Potential UCLs to Use		
2149				AppChi2		N/A				95% KM (t) UCL		0.00139
2150				95% Gamma Approximate UCL		N/A				95% KM (% Bootstrap) UCL		0.00132
2151				95% Adjusted Gamma UCL		N/A						
2152	Warning: Recommended UCL exceeds the maximum observation											
2153	Note: DL/2 is not a recommended method.											
2154												
2155												
2156	Arsenic, dissolved (ow-2d)											
2157												
2158	General Statistics											
2159				Number of Valid Data		14				Number of Detected Data		3
2160				Number of Distinct Detected Data		3				Number of Non-Detect Data		11
2161										Percent Non-Detects		78.57%
2162												
2163	Raw Statistics									Log-transformed Statistics		
2164				Minimum Detected		0.002				Minimum Detected		-6.215
2165				Maximum Detected		0.0033				Maximum Detected		-5.714
2166				Mean of Detected		0.0025				Mean of Detected		-6.014
2167				SD of Detected		0.0006979				SD of Detected		0.265
2168				Minimum Non-Detect		0.005				Minimum Non-Detect		-5.298
2169				Maximum Non-Detect		0.01				Maximum Non-Detect		-4.605
2170												
2171	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
2172	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
2173	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%

2174												
2175	**Warning: There are only 3 Distinct Detected Values in this data set**											
2176	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2177	**Those methods will return a 'N/A' value on your output display!**											
2178												
2179	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2180	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2181												
2182												
2183	**UCL Statistics**											
2184	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2185				Shapiro Wilk Test Statistic	0.867					Shapiro Wilk Test Statistic	0.892	
2186				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
2187	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2188												
2189	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2190				DL/2 Substitution Method						DL/2 Substitution Method		
2191				Mean	0.00322					Mean	-5.798	
2192				SD	0.0012					SD	0.344	
2193				95% DL/2 (t) UCL	0.00378					95% H-Stat (DL/2) UCL	0.00564	
2194												
2195				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2196	**MLE method failed to converge properly**									Mean in Log Scale	-6.014	
2197										SD in Log Scale	0.259	
2198										Mean in Original Scale	0.00252	
2199										SD in Original Scale	0.0006563	
2200										95% Percentile Bootstrap UCL	0.0028	
2201										95% BCA Bootstrap UCL	0.00282	
2202												
2203	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2204				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
2205				Theta Star	N/A							
2206				nu star	N/A							
2207												
2208				A-D Test Statistic	0.413		**Nonparametric Statistics**					
2209				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
2210				K-S Test Statistic	N/A					Mean	0.0025	
2211				5% K-S Critical Value	N/A					SD	0.0005698	
2212	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0004029	
2213										95% KM (t) UCL	0.00322	
2214	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00317	
2215				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00335	
2216				Minimum	N/A					95% KM (bootstrap t) UCL	0.00596	
2217				Maximum	N/A					95% KM (BCA) UCL	0.0033	
2218				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
2219				Median	N/A					95% KM (Chebyshev) UCL	0.00426	
2220				SD	N/A					97.5% KM (Chebyshev) UCL	0.00502	
2221				k star	N/A					99% KM (Chebyshev) UCL	0.00651	
2222				Theta star	N/A							
2223				Nu star	N/A		**Potential UCLs to Use**					
2224				AppChi2	N/A					95% KM (t) UCL	0.00322	
2225				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
2226				95% Adjusted Gamma UCL	N/A							

	A	B	C	D	E	F	G	H	I	J	K	L
2227	**Note: DL/2 is not a recommended method.**											
2228												
2229												
2230	**Arsenic, dissolved (ow-2m)**											
2231												
2232	**General Statistics**											
2233	Number of Valid Data					13	Number of Detected Data					2
2234	Number of Distinct Detected Data					2	Number of Non-Detect Data					11
2235							Percent Non-Detects					84.62%
2236												
2237	**Raw Statistics**						**Log-transformed Statistics**					
2238	Minimum Detected					0.00108	Minimum Detected					-6.831
2239	Maximum Detected					0.00165	Maximum Detected					-6.407
2240	Mean of Detected					0.00137	Mean of Detected					-6.619
2241	SD of Detected					0.0004031	SD of Detected					0.3
2242	Minimum Non-Detect					0.001	Minimum Non-Detect					-6.908
2243	Maximum Non-Detect					0.01	Maximum Non-Detect					-4.605
2244												
2245	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					13
2246	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					0
2247	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					100.00%
2248												
2249	**Warning: Data set has only 2 Distinct Detected Values.**											
2250	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
2251	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2252												
2253	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
2254												
2255	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2256	**Those methods will return a 'N/A' value on your output display!**											
2257												
2258	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2259	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2260												
2261												
2262	**UCL Statistics**											
2263	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2264	Shapiro Wilk Test Statistic					1	Shapiro Wilk Test Statistic					1
2265	5% Shapiro Wilk Critical Value					N/A	5% Shapiro Wilk Critical Value					N/A
2266	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2267												
2268	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2269	DL/2 Substitution Method						DL/2 Substitution Method					
2270	Mean					0.00275	Mean					-6.052
2271	SD					0.00143	SD					0.636
2272	95% DL/2 (t) UCL					0.00346	95% H-Stat (DL/2) UCL					0.00692
2273												
2274	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2275	**MLE method failed to converge properly**						Mean in Log Scale					N/A
2276							SD in Log Scale					N/A
2277							Mean in Original Scale					N/A
2278							SD in Original Scale					N/A
2279							95% Percentile Bootstrap UCL					N/A

2280											95% BCA Bootstrap UCL	N/A
2281												
2282	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2283					k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**					
2284					Theta Star	N/A						
2285					nu star	N/A						
2286												
2287					A-D Test Statistic	0.359	**Nonparametric Statistics**					
2288					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
2289					K-S Test Statistic	N/A					Mean	0.00127
2290					5% K-S Critical Value	N/A					SD	0.0002687
2291	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0002194
2292											95% KM (t) UCL	0.00166
2293	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00163
2294					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00174
2295					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
2296					Maximum	N/A					95% KM (BCA) UCL	0.00165
2297					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00165
2298					Median	N/A					95% KM (Chebyshev) UCL	0.00223
2299					SD	N/A					97.5% KM (Chebyshev) UCL	0.00264
2300					k star	N/A					99% KM (Chebyshev) UCL	0.00345
2301					Theta star	N/A						
2302					Nu star	N/A	**Potential UCLs to Use**					
2303					AppChi2	N/A					95% KM (t) UCL	0.00166
2304					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.00165
2305					95% Adjusted Gamma UCL	N/A						
2306	**Warning: Recommended UCL exceeds the maximum observation**											
2307	**Note: DL/2 is not a recommended method.**											
2308												
2309												
2310	**Arsenic, dissolved (ow-2s)**											
2311												
2312	**General Statistics**											
2313					Number of Valid Data	13					Number of Detected Data	2
2314					Number of Distinct Detected Data	2					Number of Non-Detect Data	11
2315											Percent Non-Detects	84.62%
2316												
2317	**Raw Statistics**						**Log-transformed Statistics**					
2318					Minimum Detected	0.00239					Minimum Detected	-6.036
2319					Maximum Detected	0.00245					Maximum Detected	-6.012
2320					Mean of Detected	0.00242					Mean of Detected	-6.024
2321					SD of Detected	4.243E-05					SD of Detected	0.0175
2322					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
2323					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
2324												
2325	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
2326	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
2327	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
2328												
2329	**Warning: Data set has only 2 Distinct Detected Values.**											
2330	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
2331	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2332												

2333	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
2334												
2335	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2336	**Those methods will return a 'N/A' value on your output display!**											
2337												
2338	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2339	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2340												
2341												
2342	**UCL Statistics**											
2343	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2344				Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1	
2345				5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A	
2346	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2347												
2348	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2349				DL/2 Substitution Method						DL/2 Substitution Method		
2350				Mean	0.00326					Mean	-5.783	
2351				SD	0.00121					SD	0.337	
2352				95% DL/2 (t) UCL	0.00386					95% H-Stat (DL/2) UCL	0.00489	
2353												
2354				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2355	**MLE method failed to converge properly**									Mean in Log Scale	N/A	
2356										SD in Log Scale	N/A	
2357										Mean in Original Scale	N/A	
2358										SD in Original Scale	N/A	
2359										95% Percentile Bootstrap UCL	N/A	
2360										95% BCA Bootstrap UCL	N/A	
2361												
2362	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2363				k star (bias corrected)	N/A		**Data do not follow a Discernable Distribution (0.05)**					
2364				Theta Star	N/A							
2365				nu star	N/A							
2366												
2367				A-D Test Statistic	0.378		**Nonparametric Statistics**					
2368				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
2369				K-S Test Statistic	N/A					Mean	0.00242	
2370				5% K-S Critical Value	N/A					SD	0.00003	
2371	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00003	
2372										95% KM (t) UCL	0.00247	
2373	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00247	
2374				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00249	
2375				Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308	
2376				Maximum	N/A					95% KM (BCA) UCL	0.00245	
2377				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
2378				Median	N/A					95% KM (Chebyshev) UCL	0.00255	
2379				SD	N/A					97.5% KM (Chebyshev) UCL	0.00261	
2380				k star	N/A					99% KM (Chebyshev) UCL	0.00272	
2381				Theta star	N/A							
2382				Nu star	N/A		**Potential UCLs to Use**					
2383				AppChi2	N/A					95% KM (t) UCL	0.00247	
2384				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A	
2385				95% Adjusted Gamma UCL	N/A							

	A	B	C	D	E	F	G	H	I	J	K	L
2386	Warning: Recommended UCL exceeds the maximum observation											
2387	Note: DL/2 is not a recommended method.											
2388												
2389												
2390	Arsenic, dissolved (ow-3d)											
2391												
2392	General Statistics											
2393					Number of Valid Data	1			Number of Detected Data	0		
2394					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
2395									Percent Non-Detects	100.00%		
2396												
2397	Warning: This data set only has 1 observations!											
2398	Data set is too small to compute reliable and meaningful statistics and estimates!											
2399	The data set for variable Arsenic, dissolved (ow-3d) was not processed!											
2400												
2401	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2402	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2403												
2404												
2405												
2406	Arsenic, dissolved (ow-3m)											
2407												
2408	General Statistics											
2409					Number of Valid Data	3			Number of Detected Data	2		
2410					Number of Distinct Detected Data	2			Number of Non-Detect Data	1		
2411									Percent Non-Detects	33.33%		
2412												
2413	Warning: This data set only has 3 observations!											
2414	Data set is too small to compute reliable and meaningful statistics and estimates!											
2415	The data set for variable Arsenic, dissolved (ow-3m) was not processed!											
2416												
2417	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2418	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2419												
2420												
2421												
2422	Arsenic, dissolved (ow-3s)											
2423												
2424	General Statistics											
2425					Number of Valid Data	2			Number of Detected Data	0		
2426					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
2427									Percent Non-Detects	100.00%		
2428												
2429	Warning: This data set only has 2 observations!											
2430	Data set is too small to compute reliable and meaningful statistics and estimates!											
2431	The data set for variable Arsenic, dissolved (ow-3s) was not processed!											
2432												
2433	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2434	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2435												
2436												
2437												
2438	Arsenic, dissolved (ow-5d)											

2439												
2440	**General Statistics**											
2441					Number of Valid Data	14				Number of Detected Data		3
2442					Number of Distinct Detected Data	3				Number of Non-Detect Data		11
2443										Percent Non-Detects		78.57%
2444												
2445	**Raw Statistics**									**Log-transformed Statistics**		
2446					Minimum Detected	0.00124				Minimum Detected		-6.693
2447					Maximum Detected	0.00441				Maximum Detected		-5.424
2448					Mean of Detected	0.00233				Mean of Detected		-6.246
2449					SD of Detected	0.0018				SD of Detected		0.713
2450					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
2451					Maximum Non-Detect	0.01				Maximum Non-Detect		-4.605
2452												
2453	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
2454	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
2455	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
2456												
2457	**Warning: There are only 3 Distinct Detected Values in this data set**											
2458	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2459	**Those methods will return a 'N/A' value on your output display!**											
2460												
2461	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2462	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2463												
2464												
2465	**UCL Statistics**											
2466	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
2467					Shapiro Wilk Test Statistic	0.771				Shapiro Wilk Test Statistic		0.791
2468					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
2469	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
2470												
2471	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
2472					DL/2 Substitution Method					DL/2 Substitution Method		
2473					Mean	0.00318				Mean		-5.848
2474					SD	0.00139				SD		0.468
2475					95% DL/2 (t) UCL	0.00384				95% H-Stat (DL/2) UCL		0.00655
2476												
2477					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
2478	**MLE method failed to converge properly**									Mean in Log Scale		-6.246
2479										SD in Log Scale		0.663
2480										Mean in Original Scale		0.00237
2481										SD in Original Scale		0.00156
2482										95% Percentile Bootstrap UCL		0.00304
2483										95% BCA Bootstrap UCL		0.00306
2484												
2485	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
2486					k star (bias corrected)	N/A				**Data appear Normal at 5% Significance Level**		
2487					Theta Star	N/A						
2488					nu star	N/A						
2489												
2490					A-D Test Statistic	0.566				**Nonparametric Statistics**		
2491					5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method		

2492				K-S Test Statistic	N/A					Mean	0.00233	
2493				5% K-S Critical Value	N/A					SD	0.00147	
2494				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00104	
2495										95% KM (t) UCL	0.00417	
2496				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00404	
2497				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0045	
2498				Minimum	N/A					95% KM (bootstrap t) UCL	0.052	
2499				Maximum	N/A					95% KM (BCA) UCL	0.00441	
2500				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
2501				Median	N/A					95% KM (Chebyshev) UCL	0.00687	
2502				SD	N/A					97.5% KM (Chebyshev) UCL	0.00883	
2503				k star	N/A					99% KM (Chebyshev) UCL	0.0127	
2504				Theta star	N/A							
2505				Nu star	N/A					**Potential UCLs to Use**		
2506				AppChi2	N/A					95% KM (t) UCL	0.00417	
2507				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
2508				95% Adjusted Gamma UCL	N/A							
2509	**Note: DL/2 is not a recommended method.**											
2510												
2511												
2512	**Arsenic, dissolved (ow-5m)**											
2513												
2514					**General Statistics**							
2515				Number of Valid Data	14					Number of Detected Data	4	
2516				Number of Distinct Detected Data	4					Number of Non-Detect Data	10	
2517										Percent Non-Detects	71.43%	
2518												
2519				**Raw Statistics**						**Log-transformed Statistics**		
2520				Minimum Detected	0.00105					Minimum Detected	-6.859	
2521				Maximum Detected	0.0144					Maximum Detected	-4.241	
2522				Mean of Detected	0.00458					Mean of Detected	-6.057	
2523				SD of Detected	0.00655					SD of Detected	1.228	
2524				Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298	
2525				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
2526												
2527	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	13	
2528	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
2529	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	92.86%	
2530												
2531	**Warning: There are only 4 Distinct Detected Values in this data**											
2532	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2533	**the resulting calculations may not be reliable enough tp draw conclusions**											
2534												
2535	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2536												
2537												
2538					**UCL Statistics**							
2539				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
2540				Shapiro Wilk Test Statistic	0.666					Shapiro Wilk Test Statistic	0.766	
2541				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748	
2542				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
2543												
2544				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		

2545				DL/2 Substitution Method						DL/2 Substitution Method		
2546				Mean	0.00363					Mean		-5.862
2547				SD	0.00336					SD		0.665
2548				95% DL/2 (t) UCL	0.00522					95% H-Stat (DL/2) UCL		0.00965
2549												
2550				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2551				**MLE method failed to converge properly**						Mean in Log Scale		-6.429
2552										SD in Log Scale		0.868
2553										Mean in Original Scale		0.00254
2554										SD in Original Scale		0.00355
2555										95% Percentile Bootstrap UCL		0.00432
2556										95% BCA Bootstrap UCL		0.00517
2557												
2558				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
2559				k star (bias corrected)	0.385					**Data appear Lognormal at 5% Significance Level**		
2560				Theta Star	0.0119							
2561				nu star	3.083							
2562												
2563				A-D Test Statistic	0.726					**Nonparametric Statistics**		
2564				5% A-D Critical Value	0.668					Kaplan-Meier (KM) Method		
2565				K-S Test Statistic	0.668					Mean		0.00224
2566				5% K-S Critical Value	0.404					SD		0.00338
2567				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.00106
2568										95% KM (t) UCL		0.00411
2569				**Assuming Gamma Distribution**						95% KM (z) UCL		0.00398
2570				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00394
2571				Minimum	1E-09					95% KM (bootstrap t) UCL		0.0126
2572				Maximum	0.0144					95% KM (BCA) UCL		0.00492
2573				Mean	0.00405					95% KM (Percentile Bootstrap) UCL		0.00428
2574				Median	0.0037					95% KM (Chebyshev) UCL		0.00684
2575				SD	0.00394					97.5% KM (Chebyshev) UCL		0.00883
2576				k star	0.385					99% KM (Chebyshev) UCL		0.0127
2577				Theta star	0.0105							
2578				Nu star	10.78					**Potential UCLs to Use**		
2579				AppChi2	4.434					95% KM (BCA) UCL		0.00492
2580				95% Gamma Approximate UCL	0.00984							
2581				95% Adjusted Gamma UCL	N/A							
2582	**Note: DL/2 is not a recommended method.**											
2583												
2584												
2585	**Arsenic, dissolved (ow-5s)**											
2586												
2587										**General Statistics**		
2588				Number of Valid Data	14					Number of Detected Data		3
2589				Number of Distinct Detected Data	3					Number of Non-Detect Data		11
2590										Percent Non-Detects		78.57%
2591												
2592				**Raw Statistics**						**Log-transformed Statistics**		
2593				Minimum Detected	0.00133					Minimum Detected		-6.623
2594				Maximum Detected	0.00222					Maximum Detected		-6.11
2595				Mean of Detected	0.0017					Mean of Detected		-6.403
2596				SD of Detected	0.0004652					SD of Detected		0.264
2597				Minimum Non-Detect	0.005					Minimum Non-Detect		-5.298

2598				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
2599												
2600	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	14	
2601	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
2602	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
2603												
2604	**Warning: There are only 3 Distinct Detected Values in this data set**											
2605	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2606	**Those methods will return a 'N/A' value on your output display!**											
2607												
2608	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2609	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2610												
2611												
2612	**UCL Statistics**											
2613	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
2614				Shapiro Wilk Test Statistic	0.915					Shapiro Wilk Test Statistic	0.943	
2615				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
2616	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
2617												
2618	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
2619				DL/2 Substitution Method						DL/2 Substitution Method		
2620				Mean	0.00304					Mean	-5.882	
2621				SD	0.00134					SD	0.43	
2622				95% DL/2 (t) UCL	0.00368					95% H-Stat (DL/2) UCL	0.00549	
2623												
2624				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2625	**MLE method failed to converge properly**									Mean in Log Scale	-6.403	
2626										SD in Log Scale	0.264	
2627										Mean in Original Scale	0.00171	
2628										SD in Original Scale	0.0004528	
2629										95% Percentile Bootstrap UCL	0.0019	
2630										95% BCA Bootstrap UCL	0.00192	
2631												
2632	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
2633				k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**		
2634				Theta Star	N/A							
2635				nu star	N/A							
2636												
2637				A-D Test Statistic	0.34					**Nonparametric Statistics**		
2638				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
2639				K-S Test Statistic	N/A					Mean	0.0017	
2640				5% K-S Critical Value	N/A					SD	0.0003799	
2641	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0002686	
2642										95% KM (t) UCL	0.00217	
2643	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00214	
2644				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00226	
2645				Minimum	N/A					95% KM (bootstrap t) UCL	0.0033	
2646				Maximum	N/A					95% KM (BCA) UCL	0.00222	
2647				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
2648				Median	N/A					95% KM (Chebyshev) UCL	0.00287	
2649				SD	N/A					97.5% KM (Chebyshev) UCL	0.00337	
2650				k star	N/A					99% KM (Chebyshev) UCL	0.00437	

2651					Theta star	N/A						
2652					Nu star	N/A	**Potential UCLs to Use**					
2653					AppChi2	N/A					95% KM (t) UCL	0.00217
2654					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	N/A
2655					95% Adjusted Gamma UCL	N/A						
2656	**Note: DL/2 is not a recommended method.**											
2657												
2658												
2659	**Arsenic, dissolved (park moabi-4)**											
2660												
2661	**General Statistics**											
2662					Number of Valid Data	1	Number of Detected Data	0				
2663					Number of Distinct Detected Data	0	Number of Non-Detect Data	1				
2664							Percent Non-Detects	100.00%				
2665												
2666	**Warning: This data set only has 1 observations!**											
2667	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2668	**The data set for variable Arsenic, dissolved (park moabi-4) was not processed!**											
2669												
2670	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2671	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2672												
2673												
2674												
2675	**Arsenic, dissolved (pe-1)**											
2676												
2677	**General Statistics**											
2678					Number of Valid Data	2	Number of Detected Data	0				
2679					Number of Distinct Detected Data	0	Number of Non-Detect Data	2				
2680							Percent Non-Detects	100.00%				
2681												
2682	**Warning: This data set only has 2 observations!**											
2683	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2684	**The data set for variable Arsenic, dissolved (pe-1) was not processed!**											
2685												
2686	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2687	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2688												
2689												
2690												
2691	**Arsenic, dissolved (pt-1d)**											
2692												
2693	**General Statistics**											
2694					Number of Valid Data	2	Number of Detected Data	0				
2695					Number of Distinct Detected Data	0	Number of Non-Detect Data	2				
2696							Percent Non-Detects	100.00%				
2697												
2698	**Warning: This data set only has 2 observations!**											
2699	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2700	**The data set for variable Arsenic, dissolved (pt-1d) was not processed!**											
2701												
2702	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2703	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											

	A	B	C	D	E	F	G	H	I	J	K	L
2704												
2705												
2706												
2707	**Arsenic, dissolved (pt-1m)**											
2708												
2709	**General Statistics**											
2710					Number of Valid Data	2			Number of Detected Data			0
2711					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
2712									Percent Non-Detects			100.00%
2713												
2714	**Warning: This data set only has 2 observations!**											
2715	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2716	**The data set for variable Arsenic, dissolved (pt-1m) was not processed!**											
2717												
2718	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2719	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2720												
2721												
2722												
2723	**Arsenic, dissolved (pt-1s)**											
2724												
2725	**General Statistics**											
2726					Number of Valid Data	2			Number of Detected Data			0
2727					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
2728									Percent Non-Detects			100.00%
2729												
2730	**Warning: This data set only has 2 observations!**											
2731	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2732	**The data set for variable Arsenic, dissolved (pt-1s) was not processed!**											
2733												
2734	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2735	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2736												
2737												
2738												
2739	**Arsenic, dissolved (pt-2d)**											
2740												
2741	**General Statistics**											
2742					Number of Valid Data	2			Number of Detected Data			0
2743					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
2744									Percent Non-Detects			100.00%
2745												
2746	**Warning: This data set only has 2 observations!**											
2747	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2748	**The data set for variable Arsenic, dissolved (pt-2d) was not processed!**											
2749												
2750	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2751	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2752												
2753												
2754												
2755	**Arsenic, dissolved (pt-2m)**											
2756												

	A	B	C	D	E	F	G	H	I	J	K	L
2757	General Statistics											
2758					Number of Valid Data	2				Number of Detected Data		0
2759					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
2760										Percent Non-Detects		100.00%
2761												
2762	Warning: This data set only has 2 observations!											
2763	Data set is too small to compute reliable and meaningful statistics and estimates!											
2764	The data set for variable Arsenic, dissolved (pt-2m) was not processed!											
2765												
2766	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2767	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2768												
2769												
2770												
2771	Arsenic, dissolved (pt-2s)											
2772												
2773	General Statistics											
2774					Number of Valid Data	2				Number of Detected Data		0
2775					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
2776										Percent Non-Detects		100.00%
2777												
2778	Warning: This data set only has 2 observations!											
2779	Data set is too small to compute reliable and meaningful statistics and estimates!											
2780	The data set for variable Arsenic, dissolved (pt-2s) was not processed!											
2781												
2782	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2783	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2784												
2785												
2786												
2787	Arsenic, dissolved (pt-3d)											
2788												
2789	General Statistics											
2790					Number of Valid Data	2				Number of Detected Data		0
2791					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
2792										Percent Non-Detects		100.00%
2793												
2794	Warning: This data set only has 2 observations!											
2795	Data set is too small to compute reliable and meaningful statistics and estimates!											
2796	The data set for variable Arsenic, dissolved (pt-3d) was not processed!											
2797												
2798	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2799	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2800												
2801												
2802												
2803	Arsenic, dissolved (pt-3m)											
2804												
2805	General Statistics											
2806					Number of Valid Data	2				Number of Detected Data		0
2807					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
2808										Percent Non-Detects		100.00%
2809												

	A	B	C	D	E	F	G	H	I	J	K	L
2810	Warning: This data set only has 2 observations!											
2811	Data set is too small to compute reliable and meaningful statistics and estimates!											
2812	The data set for variable Arsenic, dissolved (pt-3m) was not processed!											
2813												
2814	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2815	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2816												
2817												
2818												
2819	Arsenic, dissolved (pt-3s)											
2820												
2821	General Statistics											
2822						Number of Valid Data	2			Number of Detected Data	1	
2823						Number of Distinct Detected Data	1			Number of Non-Detect Data	1	
2824										Percent Non-Detects	50.00%	
2825												
2826	Warning: This data set only has 2 observations!											
2827	Data set is too small to compute reliable and meaningful statistics and estimates!											
2828	The data set for variable Arsenic, dissolved (pt-3s) was not processed!											
2829												
2830	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2831	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2832												
2833												
2834												
2835	Arsenic, dissolved (pt-4d)											
2836												
2837	General Statistics											
2838						Number of Valid Data	2			Number of Detected Data	1	
2839						Number of Distinct Detected Data	1			Number of Non-Detect Data	1	
2840										Percent Non-Detects	50.00%	
2841												
2842	Warning: This data set only has 2 observations!											
2843	Data set is too small to compute reliable and meaningful statistics and estimates!											
2844	The data set for variable Arsenic, dissolved (pt-4d) was not processed!											
2845												
2846	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2847	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2848												
2849												
2850												
2851	Arsenic, dissolved (pt-4m)											
2852												
2853	General Statistics											
2854						Number of Valid Data	2			Number of Detected Data	0	
2855						Number of Distinct Detected Data	0			Number of Non-Detect Data	2	
2856										Percent Non-Detects	100.00%	
2857												
2858	Warning: This data set only has 2 observations!											
2859	Data set is too small to compute reliable and meaningful statistics and estimates!											
2860	The data set for variable Arsenic, dissolved (pt-4m) was not processed!											
2861												
2862	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											

	A	B	C	D	E	F	G	H	I	J	K	L
2863	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2864												
2865												
2866												
2867	Arsenic, dissolved (pt-4s)											
2868												
2869	General Statistics											
2870					Number of Valid Observations	2			Number of Distinct Observations	2		
2871												
2872												
2873	Warning: This data set only has 2 observations!											
2874	Data set is too small to compute reliable and meaningful statistics and estimates!											
2875	The data set for variable Arsenic, dissolved (pt-4s) was not processed!											
2876												
2877	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2878	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2879												
2880												
2881												
2882	Arsenic, dissolved (pt-5d)											
2883												
2884	General Statistics											
2885					Number of Valid Data	2			Number of Detected Data	1		
2886					Number of Distinct Detected Data	1			Number of Non-Detect Data	1		
2887									Percent Non-Detects	50.00%		
2888												
2889	Warning: This data set only has 2 observations!											
2890	Data set is too small to compute reliable and meaningful statistics and estimates!											
2891	The data set for variable Arsenic, dissolved (pt-5d) was not processed!											
2892												
2893	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2894	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2895												
2896												
2897												
2898	Arsenic, dissolved (pt-5m)											
2899												
2900	General Statistics											
2901					Number of Valid Data	2			Number of Detected Data	1		
2902					Number of Distinct Detected Data	1			Number of Non-Detect Data	1		
2903									Percent Non-Detects	50.00%		
2904												
2905	Warning: This data set only has 2 observations!											
2906	Data set is too small to compute reliable and meaningful statistics and estimates!											
2907	The data set for variable Arsenic, dissolved (pt-5m) was not processed!											
2908												
2909	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2910	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2911												
2912												
2913												
2914	Arsenic, dissolved (pt-5s)											
2915												

	A	B	C	D	E	F	G	H	I	J	K	L
2916	General Statistics											
2917	Number of Valid Observations					2	Number of Distinct Observations					2
2918												
2919												
2920	Warning: This data set only has 2 observations!											
2921	Data set is too small to compute reliable and meaningful statistics and estimates!											
2922	The data set for variable Arsenic, dissolved (pt-5s) was not processed!											
2923												
2924	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2925	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2926												
2927												
2928												
2929	Arsenic, dissolved (pt-6d)											
2930												
2931	General Statistics											
2932	Number of Valid Data					2	Number of Detected Data					0
2933	Number of Distinct Detected Data					0	Number of Non-Detect Data					2
2934							Percent Non-Detects					100.00%
2935												
2936	Warning: This data set only has 2 observations!											
2937	Data set is too small to compute reliable and meaningful statistics and estimates!											
2938	The data set for variable Arsenic, dissolved (pt-6d) was not processed!											
2939												
2940	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2941	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2942												
2943												
2944												
2945	Arsenic, dissolved (pt-6m)											
2946												
2947	General Statistics											
2948	Number of Valid Data					2	Number of Detected Data					0
2949	Number of Distinct Detected Data					0	Number of Non-Detect Data					2
2950							Percent Non-Detects					100.00%
2951												
2952	Warning: This data set only has 2 observations!											
2953	Data set is too small to compute reliable and meaningful statistics and estimates!											
2954	The data set for variable Arsenic, dissolved (pt-6m) was not processed!											
2955												
2956	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2957	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2958												
2959												
2960												
2961	Arsenic, dissolved (pt-6s)											
2962												
2963	General Statistics											
2964	Number of Valid Observations					2	Number of Distinct Observations					2
2965												
2966												
2967	Warning: This data set only has 2 observations!											
2968	Data set is too small to compute reliable and meaningful statistics and estimates!											

	A	B	C	D	E	F	G	H	I	J	K	L
2969	The data set for variable Arsenic, dissolved (pt-6s) was not processed!											
2970												
2971	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2972	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2973												
2974												
2975												
2976	Arsenic, dissolved (pt-7d)											
2977												
2978	General Statistics											
2979					Number of Valid Observations	1			Number of Distinct Observations	1		
2980												
2981												
2982	Warning: This data set only has 1 observations!											
2983	Data set is too small to compute reliable and meaningful statistics and estimates!											
2984	The data set for variable Arsenic, dissolved (pt-7d) was not processed!											
2985												
2986	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2987	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2988												
2989												
2990												
2991	Arsenic, dissolved (pt-7m)											
2992												
2993	General Statistics											
2994					Number of Valid Data	1			Number of Detected Data	0		
2995					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
2996									Percent Non-Detects	100.00%		
2997												
2998	Warning: This data set only has 1 observations!											
2999	Data set is too small to compute reliable and meaningful statistics and estimates!											
3000	The data set for variable Arsenic, dissolved (pt-7m) was not processed!											
3001												
3002	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3003	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3004												
3005												
3006												
3007	Arsenic, dissolved (pt-7s)											
3008												
3009	General Statistics											
3010					Number of Valid Data	1			Number of Detected Data	0		
3011					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
3012									Percent Non-Detects	100.00%		
3013												
3014	Warning: This data set only has 1 observations!											
3015	Data set is too small to compute reliable and meaningful statistics and estimates!											
3016	The data set for variable Arsenic, dissolved (pt-7s) was not processed!											
3017												
3018	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3019	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3020												
3021												

	A	B	C	D	E	F	G	H	I	J	K	L
3022												
3023	**Arsenic, dissolved (pt-8d)**											
3024												
3025	**General Statistics**											
3026	Number of Valid Observations					1	Number of Distinct Observations					1
3027												
3028												
3029	**Warning: This data set only has 1 observations!**											
3030	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3031	**The data set for variable Arsenic, dissolved (pt-8d) was not processed!**											
3032												
3033	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3034	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3035												
3036												
3037												
3038	**Arsenic, dissolved (pt-8m)**											
3039												
3040	**General Statistics**											
3041	Number of Valid Data					1	Number of Detected Data					0
3042	Number of Distinct Detected Data					0	Number of Non-Detect Data					1
3043							Percent Non-Detects					100.00%
3044												
3045	**Warning: This data set only has 1 observations!**											
3046	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3047	**The data set for variable Arsenic, dissolved (pt-8m) was not processed!**											
3048												
3049	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3050	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3051												
3052												
3053												
3054	**Arsenic, dissolved (pt-8s)**											
3055												
3056	**General Statistics**											
3057	Number of Valid Data					1	Number of Detected Data					0
3058	Number of Distinct Detected Data					0	Number of Non-Detect Data					1
3059							Percent Non-Detects					100.00%
3060												
3061	**Warning: This data set only has 1 observations!**											
3062	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3063	**The data set for variable Arsenic, dissolved (pt-8s) was not processed!**											
3064												
3065	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3066	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3067												
3068												
3069												
3070	**Arsenic, dissolved (pt-9d)**											
3071												
3072	**General Statistics**											
3073	Number of Valid Observations					1	Number of Distinct Observations					1
3074												

	A	B	C	D	E	F	G	H	I	J	K	L
3075												
3076	Warning: This data set only has 1 observations!											
3077	Data set is too small to compute reliable and meaningful statistics and estimates!											
3078	The data set for variable Arsenic, dissolved (pt-9d) was not processed!											
3079												
3080	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3081	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3082												
3083												
3084												
3085	Arsenic, dissolved (pt-9m)											
3086												
3087	General Statistics											
3088					Number of Valid Data	1			Number of Detected Data	0		
3089					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
3090									Percent Non-Detects	100.00%		
3091												
3092	Warning: This data set only has 1 observations!											
3093	Data set is too small to compute reliable and meaningful statistics and estimates!											
3094	The data set for variable Arsenic, dissolved (pt-9m) was not processed!											
3095												
3096	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3097	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3098												
3099												
3100												
3101	Arsenic, dissolved (pt-9s)											
3102												
3103	General Statistics											
3104					Number of Valid Data	1			Number of Detected Data	0		
3105					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
3106									Percent Non-Detects	100.00%		
3107												
3108	Warning: This data set only has 1 observations!											
3109	Data set is too small to compute reliable and meaningful statistics and estimates!											
3110	The data set for variable Arsenic, dissolved (pt-9s) was not processed!											
3111												
3112	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3113	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3114												
3115												
3116												
3117	Arsenic, dissolved (pti-1d)											
3118												
3119	General Statistics											
3120					Number of Valid Data	2			Number of Detected Data	0		
3121					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
3122									Percent Non-Detects	100.00%		
3123												
3124	Warning: This data set only has 2 observations!											
3125	Data set is too small to compute reliable and meaningful statistics and estimates!											
3126	The data set for variable Arsenic, dissolved (pti-1d) was not processed!											
3127												

	A	B	C	D	E	F	G	H	I	J	K	L
3128	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3129	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3130												
3131												
3132												
3133	Arsenic, dissolved (pti-1m)											
3134												
3135	General Statistics											
3136					Number of Valid Data	2			Number of Detected Data	0		
3137					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
3138									Percent Non-Detects	100.00%		
3139												
3140	Warning: This data set only has 2 observations!											
3141	Data set is too small to compute reliable and meaningful statistics and estimates!											
3142	The data set for variable Arsenic, dissolved (pti-1m) was not processed!											
3143												
3144	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3145	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3146												
3147												
3148												
3149	Arsenic, dissolved (pti-1s)											
3150												
3151	General Statistics											
3152					Number of Valid Observations	2			Number of Distinct Observations	2		
3153												
3154												
3155	Warning: This data set only has 2 observations!											
3156	Data set is too small to compute reliable and meaningful statistics and estimates!											
3157	The data set for variable Arsenic, dissolved (pti-1s) was not processed!											
3158												
3159	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3160	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3161												
3162												
3163												
3164	Arsenic, dissolved (ptr-1)											
3165												
3166	General Statistics											
3167					Number of Valid Data	1			Number of Detected Data	0		
3168					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
3169									Percent Non-Detects	100.00%		
3170												
3171	Warning: This data set only has 1 observations!											
3172	Data set is too small to compute reliable and meaningful statistics and estimates!											
3173	The data set for variable Arsenic, dissolved (ptr-1) was not processed!											
3174												
3175	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3176	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3177												
3178												
3179												
3180	Arsenic, dissolved (ptr-2)											

3181												
3182						General Statistics						
3183						Number of Valid Data	1			Number of Detected Data	0	
3184						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
3185										Percent Non-Detects	100.00%	
3186												
3187						Warning: This data set only has 1 observations!						
3188						Data set is too small to compute reliable and meaningful statistics and estimates!						
3189						The data set for variable Arsenic, dissolved (ptr-2) was not processed!						
3190												
3191						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
3192						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
3193												
3194												
3195												
3196	Arsenic, dissolved (tw-1)											
3197												
3198						General Statistics						
3199						Number of Valid Data	4			Number of Detected Data	0	
3200						Number of Distinct Detected Data	0			Number of Non-Detect Data	4	
3201										Percent Non-Detects	100.00%	
3202												
3203						Warning: This data set only has 4 observations!						
3204						Data set is too small to compute reliable and meaningful statistics and estimates!						
3205						The data set for variable Arsenic, dissolved (tw-1) was not processed!						
3206												
3207						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
3208						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
3209												
3210												
3211												
3212	Arsenic, dissolved (tw-2d)											
3213												
3214						General Statistics						
3215						Number of Valid Data	5			Number of Detected Data	1	
3216						Number of Distinct Detected Data	1			Number of Non-Detect Data	4	
3217										Percent Non-Detects	80.00%	
3218												
3219						Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!						
3220						It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).						
3221												
3222						The data set for variable Arsenic, dissolved (tw-2d) was not processed!						
3223												
3224												
3225												
3226	Arsenic, dissolved (tw-2s)											
3227												
3228						General Statistics						
3229						Number of Valid Data	3			Number of Detected Data	0	
3230						Number of Distinct Detected Data	0			Number of Non-Detect Data	3	
3231										Percent Non-Detects	100.00%	
3232												
3233						Warning: This data set only has 3 observations!						

	A	B	C	D	E	F	G	H	I	J	K	L
3234	Data set is too small to compute reliable and meaningful statistics and estimates!											
3235	The data set for variable Arsenic, dissolved (tw-2s) was not processed!											
3236												
3237	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3238	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3239												
3240												
3241												
3242	Arsenic, dissolved (tw-3d)											
3243												
3244	General Statistics											
3245						Number of Valid Data	2			Number of Detected Data	0	
3246						Number of Distinct Detected Data	0			Number of Non-Detect Data	2	
3247										Percent Non-Detects	100.00%	
3248												
3249	Warning: This data set only has 2 observations!											
3250	Data set is too small to compute reliable and meaningful statistics and estimates!											
3251	The data set for variable Arsenic, dissolved (tw-3d) was not processed!											
3252												
3253	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3254	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3255												
3256												

General UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Barium, dissolved (1)

General Statistics

Number of Valid Observations	149	Number of Distinct Observations	137

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0115	Minimum of Log Data	-4.465
Maximum	0.188	Maximum of Log Data	-1.671
Mean	0.06	Mean of log Data	-2.993
Median	0.0488	SD of log Data	0.601
SD	0.0381		
Coefficient of Variation	0.635		
Skewness	1.361		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.163	Lilliefors Test Statistic	0.0451
Lilliefors Critical Value	0.0726	Lilliefors Critical Value	0.0726
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0652	95% H-UCL	0.0658
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0739
95% Adjusted-CLT UCL	0.0655	97.5% Chebyshev (MVUE) UCL	0.0799
95% Modified-t UCL	0.0652	99% Chebyshev (MVUE) UCL	0.0917
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.885	**Data appear Lognormal at 5% Significance Level**	
Theta Star	0.0208		
nu star	859.9		
Approximate Chi Square Value (.05)	792.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0484	95% CLT UCL	0.0651
Adjusted Chi Square Value	792.2	95% Jackknife UCL	0.0652
		95% Standard Bootstrap UCL	0.0651
Anderson-Darling Test Statistic	1.423	95% Bootstrap-t UCL	0.0655
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	0.0654
Kolmogorov-Smirnov Test Statistic	0.0846	95% Percentile Bootstrap UCL	0.0653
Kolmogorov-Smirnov 5% Critical Value	0.0774	95% BCA Bootstrap UCL	0.0654
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0736
		97.5% Chebyshev(Mean, Sd) UCL	0.0795
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.091
95% Approximate Gamma UCL	0.0651		
95% Adjusted Gamma UCL	0.0651		
Potential UCL to Use		Use 95% H-UCL	0.0658

	A	B	C	D	E	F	G	H	I	J	K	L
54												
55												
56	**Barium, dissolved (cw-1d)**											
57												
58						**General Statistics**						
59					Number of Valid Data	8			Number of Detected Data			5
60					Number of Distinct Detected Data	5			Number of Non-Detect Data			3
61									Percent Non-Detects			37.50%
62												
63					**Raw Statistics**				**Log-transformed Statistics**			
64					Minimum Detected	0.0203			Minimum Detected			-3.897
65					Maximum Detected	0.0721			Maximum Detected			-2.63
66					Mean of Detected	0.0461			Mean of Detected			-3.22
67					SD of Detected	0.0251			SD of Detected			0.624
68					Minimum Non-Detect	0.3			Minimum Non-Detect			-1.204
69					Maximum Non-Detect	0.3			Maximum Non-Detect			-1.204
70												
71												
72					**Warning: There are only 5 Detected Values in this data**							
73					**Note: It should be noted that even though bootstrap may be performed on this data set**							
74					**the resulting calculations may not be reliable enough tp draw conclusions**							
75												
76					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
77												
78												
79						**UCL Statistics**						
80					**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**			
81					Shapiro Wilk Test Statistic	0.845			Shapiro Wilk Test Statistic			0.821
82					5% Shapiro Wilk Critical Value	0.762			5% Shapiro Wilk Critical Value			0.762
83					**Data appear Normal at 5% Significance Level**				**Data appear Lognormal at 5% Significance Level**			
84												
85					**Assuming Normal Distribution**				**Assuming Lognormal Distribution**			
86					DL/2 Substitution Method				DL/2 Substitution Method			
87					Mean	0.0851			Mean			-2.724
88					SD	0.057			SD			0.831
89					95% DL/2 (t) UCL	0.123			95% H-Stat (DL/2) UCL			1.087
90												
91					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
92					**MLE method failed to converge properly**				Mean in Log Scale			-3.22
93									SD in Log Scale			0.548
94									Mean in Original Scale			0.0452
95									SD in Original Scale			0.0224
96									95% Percentile Bootstrap UCL			0.0578
97									95% BCA Bootstrap UCL			0.0578
98												
99					**Gamma Distribution Test with Detected Values Only**				**Data Distribution Test with Detected Values Only**			
100					k star (bias corrected)	1.594			**Data appear Normal at 5% Significance Level**			
101					Theta Star	0.0289						
102					nu star	15.94						
103												
104					A-D Test Statistic	0.52			**Nonparametric Statistics**			
105					5% A-D Critical Value	0.682			Kaplan-Meier (KM) Method			
106					K-S Test Statistic	0.682			Mean			0.0461

107				5% K-S Critical Value	0.359					SD	0.0224
108	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.0112
109										95% KM (t) UCL	0.0673
110	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0645
111	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL	0.0683
112				Minimum	0.0203					95% KM (bootstrap t) UCL	0.0736
113				Maximum	0.0721					95% KM (BCA) UCL	0.0631
114				Mean	0.0463					95% KM (Percentile Bootstrap) UCL	0.0631
115				Median	0.0476					95% KM (Chebyshev) UCL	0.095
116				SD	0.0224					97.5% KM (Chebyshev) UCL	0.116
117				k star	2.72					99% KM (Chebyshev) UCL	0.158
118				Theta star	0.017						
119				Nu star	43.53					**Potential UCLs to Use**	
120				AppChi2	29.4					95% KM (t) UCL	0.0673
121				95% Gamma Approximate UCL	0.0685					95% KM (Percentile Bootstrap) UCL	0.0631
122				95% Adjusted Gamma UCL	0.076						
123	**Note: DL/2 is not a recommended method.**										
124											
125											
126	**Barium, dissolved (cw-1m)**										
127											
128					**General Statistics**						
129				Number of Valid Data	8					Number of Detected Data	6
130				Number of Distinct Detected Data	6					Number of Non-Detect Data	2
131										Percent Non-Detects	25.00%
132											
133				**Raw Statistics**						**Log-transformed Statistics**	
134				Minimum Detected	0.0444					Minimum Detected	-3.115
135				Maximum Detected	0.0862					Maximum Detected	-2.451
136				Mean of Detected	0.0656					Mean of Detected	-2.755
137				SD of Detected	0.0179					SD of Detected	0.277
138				Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
139				Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
140											
141											
142	**Warning: There are only 6 Detected Values in this data**										
143	**Note: It should be noted that even though bootstrap may be performed on this data set**										
144	**the resulting calculations may not be reliable enough tp draw conclusions**										
145											
146	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**										
147											
148											
149					**UCL Statistics**						
150				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
151				Shapiro Wilk Test Statistic	0.894					Shapiro Wilk Test Statistic	0.912
152				5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
153				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
154											
155				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
156				DL/2 Substitution Method						DL/2 Substitution Method	
157				Mean	0.0867					Mean	-2.541
158				SD	0.0419					SD	0.461
159				95% DL/2 (t) UCL	0.115					95% H-Stat (DL/2) UCL	0.362

160												
161				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
162				**MLE method failed to converge properly**						Mean in Log Scale		-2.755
163										SD in Log Scale		0.248
164										Mean in Original Scale		0.0653
165										SD in Original Scale		0.016
166										95% Percentile Bootstrap UCL		0.0742
167										95% BCA Bootstrap UCL		0.0743
168												
169				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
170				k star (bias corrected)		8.07				**Data appear Normal at 5% Significance Level**		
171				Theta Star		0.00813						
172				nu star		96.84						
173												
174				A-D Test Statistic		0.35				**Nonparametric Statistics**		
175				5% A-D Critical Value		0.698				Kaplan-Meier (KM) Method		
176				K-S Test Statistic		0.698				Mean		0.0656
177				5% K-S Critical Value		0.332				SD		0.0164
178				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		0.00732
179										95% KM (t) UCL		0.0795
180				**Assuming Gamma Distribution**						95% KM (z) UCL		0.0777
181				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0798
182				Minimum		0.0444				95% KM (bootstrap t) UCL		0.0833
183				Maximum		0.0862				95% KM (BCA) UCL		0.0773
184				Mean		0.066				95% KM (Percentile Bootstrap) UCL		0.0769
185				Median		0.0636				95% KM (Chebyshev) UCL		0.0975
186				SD		0.016				97.5% KM (Chebyshev) UCL		0.111
187				k star		11.98				99% KM (Chebyshev) UCL		0.138
188				Theta star		0.00551						
189				Nu star		191.7				**Potential UCLs to Use**		
190				AppChi2		160.6				95% KM (t) UCL		0.0795
191				95% Gamma Approximate UCL		0.0788				95% KM (Percentile Bootstrap) UCL		0.0769
192				95% Adjusted Gamma UCL		0.0825						
193	**Note: DL/2 is not a recommended method.**											
194												
195												
196	**Barium, dissolved (cw-2d)**											
197												
198										**General Statistics**		
199				Number of Valid Data		8				Number of Detected Data		5
200				Number of Distinct Detected Data		5				Number of Non-Detect Data		3
201										Percent Non-Detects		37.50%
202												
203				**Raw Statistics**						**Log-transformed Statistics**		
204				Minimum Detected		0.0106				Minimum Detected		-4.547
205				Maximum Detected		0.0766				Maximum Detected		-2.569
206				Mean of Detected		0.0435				Mean of Detected		-3.412
207				SD of Detected		0.0304				SD of Detected		0.903
208				Minimum Non-Detect		0.3				Minimum Non-Detect		-1.204
209				Maximum Non-Detect		0.3				Maximum Non-Detect		-1.204
210												
211												
212						**Warning: There are only 5 Detected Values in this data**							

213	Note: It should be noted that even though bootstrap may be performed on this data set											
214	the resulting calculations may not be reliable enough tp draw conclusions											
215												
216	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
217												
218												
219	UCL Statistics											
220	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
221	Shapiro Wilk Test Statistic				0.884		Shapiro Wilk Test Statistic					0.868
222	5% Shapiro Wilk Critical Value				0.762		5% Shapiro Wilk Critical Value					0.762
223	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
224												
225	Assuming Normal Distribution						Assuming Lognormal Distribution					
226	DL/2 Substitution Method						DL/2 Substitution Method					
227	Mean				0.0834		Mean					-2.844
228	SD				0.0597		SD					1.04
229	95% DL/2 (t) UCL				0.123		95% H-Stat (DL/2) UCL					1.804
230												
231	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
232	MLE method failed to converge properly						Mean in Log Scale					-3.412
233							SD in Log Scale					0.798
234							Mean in Original Scale					0.0421
235							SD in Original Scale					0.0277
236							95% Percentile Bootstrap UCL					0.0571
237							95% BCA Bootstrap UCL					0.0573
238												
239	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
240	k star (bias corrected)				0.914		Data appear Normal at 5% Significance Level					
241	Theta Star				0.0476							
242	nu star				9.143							
243												
244	A-D Test Statistic				0.421		Nonparametric Statistics					
245	5% A-D Critical Value				0.685		Kaplan-Meier (KM) Method					
246	K-S Test Statistic				0.685		Mean					0.0435
247	5% K-S Critical Value				0.361		SD					0.0272
248	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.0136
249							95% KM (t) UCL					0.0692
250	Assuming Gamma Distribution						95% KM (z) UCL					0.0659
251	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0704
252	Minimum				0.0106		95% KM (bootstrap t) UCL					0.0743
253	Maximum				0.0766		95% KM (BCA) UCL					0.0655
254	Mean				0.0434		95% KM (Percentile Bootstrap) UCL					0.0639
255	Median				0.0437		95% KM (Chebyshev) UCL					0.103
256	SD				0.0274		97.5% KM (Chebyshev) UCL					0.128
257	k star				1.478		99% KM (Chebyshev) UCL					0.179
258	Theta star				0.0294							
259	Nu star				23.66		Potential UCLs to Use					
260	AppChi2				13.59		95% KM (t) UCL					0.0692
261	95% Gamma Approximate UCL				0.0756		95% KM (Percentile Bootstrap) UCL					0.0639
262	95% Adjusted Gamma UCL				0.0877							
263	Note: DL/2 is not a recommended method.											
264												
265												

266	**Barium, dissolved (cw-2m)**											
267												
268	**General Statistics**											
269					Number of Valid Data	8				Number of Detected Data	6	
270					Number of Distinct Detected Data	6				Number of Non-Detect Data	2	
271										Percent Non-Detects	25.00%	
272												
273	**Raw Statistics**						**Log-transformed Statistics**					
274					Minimum Detected	0.0481				Minimum Detected	-3.034	
275					Maximum Detected	0.0684				Maximum Detected	-2.682	
276					Mean of Detected	0.0593				Mean of Detected	-2.831	
277					SD of Detected	0.00651				SD of Detected	0.114	
278					Minimum Non-Detect	0.3				Minimum Non-Detect	-1.204	
279					Maximum Non-Detect	0.3				Maximum Non-Detect	-1.204	
280												
281												
282	**Warning: There are only 6 Detected Values in this data**											
283	**Note: It should be noted that even though bootstrap may be performed on this data set**											
284	**the resulting calculations may not be reliable enough tp draw conclusions**											
285												
286	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
287												
288												
289	**UCL Statistics**											
290	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
291					Shapiro Wilk Test Statistic	0.89				Shapiro Wilk Test Statistic	0.87	
292					5% Shapiro Wilk Critical Value	0.788				5% Shapiro Wilk Critical Value	0.788	
293	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
294												
295	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
296					DL/2 Substitution Method					DL/2 Substitution Method		
297					Mean	0.082				Mean	-2.598	
298					SD	0.0424				SD	0.443	
299					95% DL/2 (t) UCL	0.11				95% H-Stat (DL/2) UCL	0.343	
300												
301					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
302	**MLE method failed to converge properly**									Mean in Log Scale	-2.831	
303										SD in Log Scale	0.101	
304										Mean in Original Scale	0.0592	
305										SD in Original Scale	0.00579	
306										95% Percentile Bootstrap UCL	0.0622	
307										95% BCA Bootstrap UCL	0.0621	
308												
309	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
310					k star (bias corrected)	47.57	**Data appear Normal at 5% Significance Level**					
311					Theta Star	0.00125						
312					nu star	570.9						
313												
314					A-D Test Statistic	0.537	**Nonparametric Statistics**					
315					5% A-D Critical Value	0.696				Kaplan-Meier (KM) Method		
316					K-S Test Statistic	0.696				Mean	0.0593	
317					5% K-S Critical Value	0.332				SD	0.00594	
318	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00266	

319											95% KM (t) UCL	0.0643
320	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0636
321				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.0644
322					Minimum	0.0481					95% KM (bootstrap t) UCL	0.0635
323					Maximum	0.0684					95% KM (BCA) UCL	0.0631
324					Mean	0.0594					95% KM (Percentile Bootstrap) UCL	0.063
325					Median	0.0598					95% KM (Chebyshev) UCL	0.0709
326					SD	0.00579					97.5% KM (Chebyshev) UCL	0.0759
327					k star	71.93					99% KM (Chebyshev) UCL	0.0857
328					Theta star	0.0008262						
329					Nu star	1151					**Potential UCLs to Use**	
330					AppChi2	1073					95% KM (t) UCL	0.0643
331				95% Gamma Approximate UCL		0.0637					95% KM (Percentile Bootstrap) UCL	0.063
332				95% Adjusted Gamma UCL		0.0649						
333	**Note: DL/2 is not a recommended method.**											
334												
335												
336	**Barium, dissolved (cw-3d)**											
337												
338	**General Statistics**											
339				Number of Valid Data		8					Number of Detected Data	5
340				Number of Distinct Detected Data		5					Number of Non-Detect Data	3
341											Percent Non-Detects	37.50%
342												
343	**Raw Statistics**										**Log-transformed Statistics**	
344					Minimum Detected	0.0127					Minimum Detected	-4.366
345					Maximum Detected	0.119					Maximum Detected	-2.129
346					Mean of Detected	0.0652					Mean of Detected	-3.031
347					SD of Detected	0.0461					SD of Detected	0.961
348					Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
349					Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
350												
351												
352	**Warning: There are only 5 Detected Values in this data**											
353	**Note: It should be noted that even though bootstrap may be performed on this data set**											
354	**the resulting calculations may not be reliable enough tp draw conclusions**											
355												
356	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
357												
358												
359	**UCL Statistics**											
360	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
361					Shapiro Wilk Test Statistic	0.927					Shapiro Wilk Test Statistic	0.899
362					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
363	**Data appear Normal at 5% Significance Level**										**Data appear Lognormal at 5% Significance Level**	
364												
365	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
366					DL/2 Substitution Method						DL/2 Substitution Method	
367					Mean	0.097					Mean	-2.606
368					SD	0.056					SD	0.934
369					95% DL/2 (t) UCL	0.135					95% H-Stat (DL/2) UCL	1.102
370												
371					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	

372	**MLE method failed to converge properly**									Mean in Log Scale		-3.031
373										SD in Log Scale		0.851
374										Mean in Original Scale		0.0633
375										SD in Original Scale		0.0427
376										95% Percentile Bootstrap UCL		0.0873
377										95% BCA Bootstrap UCL		0.0857
378												
379	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
380				k star (bias corrected)	0.858					**Data appear Normal at 5% Significance Level**		
381				Theta Star	0.076							
382				nu star	8.577							
383												
384				A-D Test Statistic	0.34					**Nonparametric Statistics**		
385				5% A-D Critical Value	0.685					Kaplan-Meier (KM) Method		
386				K-S Test Statistic	0.685					Mean		0.0652
387				5% K-S Critical Value	0.361					SD		0.0412
388	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.0206
389										95% KM (t) UCL		0.104
390	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0991
391				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.106
392				Minimum	0.0127					95% KM (bootstrap t) UCL		0.108
393				Maximum	0.119					95% KM (BCA) UCL		0.1
394				Mean	0.065					95% KM (Percentile Bootstrap) UCL		0.0977
395				Median	0.0662					95% KM (Chebyshev) UCL		0.155
396				SD	0.0418					97.5% KM (Chebyshev) UCL		0.194
397				k star	1.381					99% KM (Chebyshev) UCL		0.27
398				Theta star	0.047							
399				Nu star	22.1					**Potential UCLs to Use**		
400				AppChi2	12.41					95% KM (t) UCL		0.104
401				95% Gamma Approximate UCL	0.116					95% KM (Percentile Bootstrap) UCL		0.0977
402				95% Adjusted Gamma UCL	0.135							
403	**Note: DL/2 is not a recommended method.**											
404												
405												
406	**Barium, dissolved (cw-3m)**											
407												
408	**General Statistics**											
409				Number of Valid Data	8					Number of Detected Data		5
410				Number of Distinct Detected Data	5					Number of Non-Detect Data		3
411										Percent Non-Detects		37.50%
412												
413	**Raw Statistics**									**Log-transformed Statistics**		
414				Minimum Detected	0.0413					Minimum Detected		-3.187
415				Maximum Detected	0.0611					Maximum Detected		-2.795
416				Mean of Detected	0.0524					Mean of Detected		-2.957
417				SD of Detected	0.0072					SD of Detected		0.144
418				Minimum Non-Detect	0.3					Minimum Non-Detect		-1.204
419				Maximum Non-Detect	0.3					Maximum Non-Detect		-1.204
420												
421												
422	**Warning: There are only 5 Detected Values in this data**											
423	**Note: It should be noted that even though bootstrap may be performed on this data set**											
424	**the resulting calculations may not be reliable enough tp draw conclusions**											

	A	B	C	D	E	F	G	H	I	J	K	L
425												
426	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
427												
428												
429	**UCL Statistics**											
430	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
431	Shapiro Wilk Test Statistic					0.936	Shapiro Wilk Test Statistic					0.911
432	5% Shapiro Wilk Critical Value					0.762	5% Shapiro Wilk Critical Value					0.762
433	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
434												
435	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
436	DL/2 Substitution Method						DL/2 Substitution Method					
437	Mean					0.089	Mean					-2.559
438	SD					0.0508	SD					0.559
439	95% DL/2 (t) UCL					0.123	95% H-Stat (DL/2) UCL					0.441
440												
441	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
442	**MLE method failed to converge properly**						Mean in Log Scale					-2.957
443							SD in Log Scale					0.127
444							Mean in Original Scale					0.0523
445							SD in Original Scale					0.00642
446							95% Percentile Bootstrap UCL					0.0558
447							95% BCA Bootstrap UCL					0.0556
448												
449	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
450	k star (bias corrected)					25.09	**Data appear Normal at 5% Significance Level**					
451	Theta Star					0.00209						
452	nu star					250.9						
453												
454	A-D Test Statistic					0.366	**Nonparametric Statistics**					
455	5% A-D Critical Value					0.678	Kaplan-Meier (KM) Method					
456	K-S Test Statistic					0.678	Mean					0.0524
457	5% K-S Critical Value					0.357	SD					0.00644
458	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00322
459							95% KM (t) UCL					0.0585
460	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0577
461	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0588
462	Minimum					0.0413	95% KM (bootstrap t) UCL					0.0576
463	Maximum					0.0611	95% KM (BCA) UCL					0.0572
464	Mean					0.0525	95% KM (Percentile Bootstrap) UCL					0.057
465	Median					0.0539	95% KM (Chebyshev) UCL					0.0664
466	SD					0.00639	97.5% KM (Chebyshev) UCL					0.0725
467	k star					45.96	99% KM (Chebyshev) UCL					0.0844
468	Theta star					0.00114						
469	Nu star					735.4	**Potential UCLs to Use**					
470	AppChi2					673.4	95% KM (t) UCL					0.0585
471	95% Gamma Approximate UCL					0.0574	95% KM (Percentile Bootstrap) UCL					0.057
472	95% Adjusted Gamma UCL					0.0587						
473	**Note: DL/2 is not a recommended method.**											
474												
475												
476	**Barium, dissolved (cw-4d)**											
477												

	A	B	C	D	E	F	G	H	I	J	K	L
478	**General Statistics**											
479					Number of Valid Data	8				Number of Detected Data		5
480					Number of Distinct Detected Data	5				Number of Non-Detect Data		3
481										Percent Non-Detects		37.50%
482												
483	**Raw Statistics**						**Log-transformed Statistics**					
484					Minimum Detected	0.0301				Minimum Detected		-3.503
485					Maximum Detected	0.0741				Maximum Detected		-2.602
486					Mean of Detected	0.049				Mean of Detected		-3.092
487					SD of Detected	0.0214				SD of Detected		0.43
488					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
489					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
490												
491												
492	**Warning: There are only 5 Detected Values in this data**											
493	**Note: It should be noted that even though bootstrap may be performed on this data set**											
494	**the resulting calculations may not be reliable enough tp draw conclusions**											
495												
496	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
497												
498												
499	**UCL Statistics**											
500	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
501					Shapiro Wilk Test Statistic	0.799				Shapiro Wilk Test Statistic		0.826
502					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
503	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
504												
505	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
506					DL/2 Substitution Method					DL/2 Substitution Method		
507					Mean	0.0869				Mean		-2.644
508					SD	0.0547				SD		0.699
509					95% DL/2 (t) UCL	0.124				95% H-Stat (DL/2) UCL		0.905
510												
511					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
512	**MLE method failed to converge properly**									Mean in Log Scale		-3.092
513										SD in Log Scale		0.378
514										Mean in Original Scale		0.0484
515										SD in Original Scale		0.0185
516										95% Percentile Bootstrap UCL		0.0579
517										95% BCA Bootstrap UCL		0.0597
518												
519	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
520					k star (bias corrected)	2.854	**Data appear Normal at 5% Significance Level**					
521					Theta Star	0.0172						
522					nu star	28.54						
523												
524					A-D Test Statistic	0.587	**Nonparametric Statistics**					
525					5% A-D Critical Value	0.68				Kaplan-Meier (KM) Method		
526					K-S Test Statistic	0.68				Mean		0.049
527					5% K-S Critical Value	0.358				SD		0.0191
528	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.00957
529										95% KM (t) UCL		0.0671
530	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0647

531	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL		0.0679
532					Minimum	0.0301				95% KM (bootstrap t) UCL		0.138
533					Maximum	0.0741				95% KM (BCA) UCL		0.0631
534					Mean	0.0492				95% KM (Percentile Bootstrap) UCL		0.0641
535					Median	0.0443				95% KM (Chebyshev) UCL		0.0907
536					SD	0.0188				97.5% KM (Chebyshev) UCL		0.109
537					k star	5.017				99% KM (Chebyshev) UCL		0.144
538					Theta star	0.00981						
539					Nu star	80.27				**Potential UCLs to Use**		
540					AppChi2	60.62				95% KM (t) UCL		0.0671
541				95% Gamma Approximate UCL		0.0652				95% KM (Percentile Bootstrap) UCL		0.0641
542				95% Adjusted Gamma UCL		0.0701						
543	**Note: DL/2 is not a recommended method.**											
544												
545												
546	**Barium, dissolved (cw-4m)**											
547												
548	**General Statistics**											
549				Number of Valid Data		8				Number of Detected Data		5
550				Number of Distinct Detected Data		5				Number of Non-Detect Data		3
551										Percent Non-Detects		37.50%
552												
553	**Raw Statistics**									**Log-transformed Statistics**		
554				Minimum Detected		0.0674				Minimum Detected		-2.697
555				Maximum Detected		0.0758				Maximum Detected		-2.58
556				Mean of Detected		0.0713				Mean of Detected		-2.642
557				SD of Detected		0.00338				SD of Detected		0.0472
558				Minimum Non-Detect		0.3				Minimum Non-Detect		-1.204
559				Maximum Non-Detect		0.3				Maximum Non-Detect		-1.204
560												
561												
562	**Warning: There are only 5 Detected Values in this data**											
563	**Note: It should be noted that even though bootstrap may be performed on this data set**											
564	**the resulting calculations may not be reliable enough tp draw conclusions**											
565												
566	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
567												
568												
569	**UCL Statistics**											
570	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
571				Shapiro Wilk Test Statistic		0.937				Shapiro Wilk Test Statistic		0.94
572				5% Shapiro Wilk Critical Value		0.762				5% Shapiro Wilk Critical Value		0.762
573	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
574												
575	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
576				DL/2 Substitution Method						DL/2 Substitution Method		
577					Mean	0.101					Mean	-2.363
578					SD	0.0408					SD	0.387
579					95% DL/2 (t) UCL	0.128				95% H-Stat (DL/2) UCL		0.349
580												
581				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
582	**MLE method failed to converge properly**									Mean in Log Scale		-2.642
583										SD in Log Scale		0.042

584											Mean in Original Scale	0.0713
585											SD in Original Scale	0.003
586											95% Percentile Bootstrap UCL	0.073
587											95% BCA Bootstrap UCL	0.073
588												
589	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
590					k star (bias corrected)	223.9	**Data appear Normal at 5% Significance Level**					
591					Theta Star	0.0003184						
592					nu star	2239						
593												
594					A-D Test Statistic	0.316	**Nonparametric Statistics**					
595					5% A-D Critical Value	0.678					Kaplan-Meier (KM) Method	
596					K-S Test Statistic	0.678					Mean	0.0713
597					5% K-S Critical Value	0.357					SD	0.00302
598	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00151
599											95% KM (t) UCL	0.0742
600	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0738
601					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0743
602					Minimum	0.0674					95% KM (bootstrap t) UCL	0.0772
603					Maximum	0.0758					95% KM (BCA) UCL	0.0737
604					Mean	0.0714					95% KM (Percentile Bootstrap) UCL	0.0737
605					Median	0.0709					95% KM (Chebyshev) UCL	0.0779
606					SD	0.00298					97.5% KM (Chebyshev) UCL	0.0807
607					k star	412.2					99% KM (Chebyshev) UCL	0.0863
608					Theta star	0.0001731						
609					Nu star	6595	**Potential UCLs to Use**					
610					AppChi2	6407					95% KM (t) UCL	0.0742
611					95% Gamma Approximate UCL	0.0735					95% KM (Percentile Bootstrap) UCL	0.0737
612					95% Adjusted Gamma UCL	0.074						
613	**Note: DL/2 is not a recommended method.**											
614												
615												
616	**Barium, dissolved (mw-1)**											
617												
618	**General Statistics**											
619					Number of Valid Observations	2					Number of Distinct Observations	2
620												
621												
622	**Warning: This data set only has 2 observations!**											
623	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
624	**The data set for variable Barium, dissolved (mw-1) was not processed!**											
625												
626	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
627	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
628												
629												
630												
631	**Barium, dissolved (mw-10)**											
632												
633	**General Statistics**											
634					Number of Valid Data	18					Number of Detected Data	14
635					Number of Distinct Detected Data	14					Number of Non-Detect Data	4
636											Percent Non-Detects	22.22%

Raw Statistics		
Minimum Detected	0.025	
Maximum Detected	0.18	
Mean of Detected	0.059	
SD of Detected	0.036	
Minimum Non-Detect	0.3	
Maximum Non-Detect	0.5	
Note: Data have multiple DLs - Use of KM Method is recommended		
For all methods (except KM, DL/2, and ROS Methods),		
Observations < Largest ND are treated as NDs		

Log-transformed Statistics		
Minimum Detected	-3.689	
Maximum Detected	-1.715	
Mean of Detected	-2.93	
SD of Detected	0.415	
Minimum Non-Detect	-1.204	
Maximum Non-Detect	-0.693	
Number treated as Non-Detect	18	
Number treated as Detected	0	
Single DL Non-Detect Percentage	100.00%	

UCL Statistics

Normal Distribution Test with Detected Values Only		
Shapiro Wilk Test Statistic	0.533	
5% Shapiro Wilk Critical Value	0.874	
Data not Normal at 5% Significance Level		
Assuming Normal Distribution		
DL/2 Substitution Method		
Mean	0.0848	
SD	0.0624	
95% DL/2 (t) UCL	0.11	
Maximum Likelihood Estimate(MLE) Method	N/A	
MLE method failed to converge properly		
Gamma Distribution Test with Detected Values Only		
k star (bias corrected)	4.107	
Theta Star	0.0144	
nu star	115	
A-D Test Statistic	1.822	
5% A-D Critical Value	0.738	
K-S Test Statistic	0.738	
5% K-S Critical Value	0.229	
Data not Gamma Distributed at 5% Significance Level		
Assuming Gamma Distribution		
Gamma ROS Statistics using Extrapolated Data		
Minimum	0.025	
Maximum	0.18	
Mean	0.0595	
Median	0.0539	
SD	0.032	
k star	5.228	
Theta star	0.0114	

Lognormal Distribution Test with Detected Values Only		
Shapiro Wilk Test Statistic	0.751	
5% Shapiro Wilk Critical Value	0.874	
Data not Lognormal at 5% Significance Level		
Assuming Lognormal Distribution		
DL/2 Substitution Method		
Mean	-2.672	
SD	0.624	
95% H-Stat (DL/2) UCL	0.187	
Log ROS Method		
Mean in Log Scale	-2.93	
SD in Log Scale	0.374	
Mean in Original Scale	0.058	
SD in Original Scale	0.032	
95% Percentile Bootstrap UCL	0.0724	
95% BCA Bootstrap UCL	0.0797	
Data Distribution Test with Detected Values Only		
Data do not follow a Discernable Distribution (0.05)		
Nonparametric Statistics		
Kaplan-Meier (KM) Method		
Mean	0.059	
SD	0.0347	
SE of Mean	0.00963	
95% KM (t) UCL	0.0758	
95% KM (z) UCL	0.0748	
95% KM (jackknife) UCL	0.0759	
95% KM (bootstrap t) UCL	0.108	
95% KM (BCA) UCL	0.0795	
95% KM (Percentile Bootstrap) UCL	0.0769	
95% KM (Chebyshev) UCL	0.101	
97.5% KM (Chebyshev) UCL	0.119	
99% KM (Chebyshev) UCL	0.155	

690					Nu star	188.2	**Potential UCLs to Use**					
691					AppChi2	157.5					95% KM (BCA) UCL	0.0795
692					95% Gamma Approximate UCL	0.0712						
693					95% Adjusted Gamma UCL	0.0724						
694	**Note: DL/2 is not a recommended method.**											
695												
696												
697	**Barium, dissolved (mw-11)**											
698												
699					**General Statistics**							
700					Number of Valid Data	14					Number of Detected Data	11
701					Number of Distinct Detected Data	11					Number of Non-Detect Data	3
702											Percent Non-Detects	21.43%
703												
704					**Raw Statistics**						**Log-transformed Statistics**	
705					Minimum Detected	0.028					Minimum Detected	-3.576
706					Maximum Detected	0.22					Maximum Detected	-1.514
707					Mean of Detected	0.056					Mean of Detected	-3.08
708					SD of Detected	0.0546					SD of Detected	0.535
709					Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
710					Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693
711												
712	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	14
713	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
714	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
715												
716					**UCL Statistics**							
717					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
718					Shapiro Wilk Test Statistic	0.425					Shapiro Wilk Test Statistic	0.569
719					5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85
720					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
721												
722					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
723					DL/2 Substitution Method						DL/2 Substitution Method	
724					Mean	0.0833					Mean	-2.79
725					SD	0.0758					SD	0.752
726					95% DL/2 (t) UCL	0.119					95% H-Stat (DL/2) UCL	0.237
727												
728					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
729					**MLE method failed to converge properly**						Mean in Log Scale	-3.08
730											SD in Log Scale	0.476
731											Mean in Original Scale	0.054
732											SD in Original Scale	0.0482
733											95% Percentile Bootstrap UCL	0.0793
734											95% BCA Bootstrap UCL	0.0928
735												
736					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
737					k star (bias corrected)	2.012					**Data do not follow a Discernable Distribution (0.05)**	
738					Theta Star	0.0278						
739					nu star	44.27						
740												
741					A-D Test Statistic	2.539					**Nonparametric Statistics**	
742					5% A-D Critical Value	0.735					Kaplan-Meier (KM) Method	

743				K-S Test Statistic	0.735					Mean	0.056	
744				5% K-S Critical Value	0.257					SD	0.0521	
745				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0165	
746										95% KM (t) UCL	0.0852	
747				**Assuming Gamma Distribution**						95% KM (z) UCL	0.0831	
748				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0855	
749				Minimum	0.028					95% KM (bootstrap t) UCL	0.337	
750				Maximum	0.22					95% KM (BCA) UCL	0.0919	
751				Mean	0.0566					95% KM (Percentile Bootstrap) UCL	0.0868	
752				Median	0.0418					95% KM (Chebyshev) UCL	0.128	
753				SD	0.0483					97.5% KM (Chebyshev) UCL	0.159	
754				k star	2.609					99% KM (Chebyshev) UCL	0.22	
755				Theta star	0.0217							
756				Nu star	73.06					**Potential UCLs to Use**		
757				AppChi2	54.38					95% KM (BCA) UCL	0.0919	
758				95% Gamma Approximate UCL	0.076							
759				95% Adjusted Gamma UCL	0.0791							
760	**Note: DL/2 is not a recommended method.**											
761												
762												
763	**Barium, dissolved (mw-12)**											
764												
765					**General Statistics**							
766				Number of Valid Data	21					Number of Detected Data	15	
767				Number of Distinct Detected Data	15					Number of Non-Detect Data	6	
768										Percent Non-Detects	28.57%	
769												
770				**Raw Statistics**						**Log-transformed Statistics**		
771				Minimum Detected	0.034					Minimum Detected	-3.381	
772				Maximum Detected	0.11					Maximum Detected	-2.207	
773				Mean of Detected	0.0628					Mean of Detected	-2.818	
774				SD of Detected	0.0208					SD of Detected	0.326	
775				Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204	
776				Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693	
777												
778	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	21	
779	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
780	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
781												
782					**UCL Statistics**							
783				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
784				Shapiro Wilk Test Statistic	0.932					Shapiro Wilk Test Statistic	0.967	
785				5% Shapiro Wilk Critical Value	0.881					5% Shapiro Wilk Critical Value	0.881	
786				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
787												
788				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
789				DL/2 Substitution Method						DL/2 Substitution Method		
790				Mean	0.0972					Mean	-2.506	
791				SD	0.0639					SD	0.589	
792				95% DL/2 (t) UCL	0.121					95% H-Stat (DL/2) UCL	0.174	
793												
794				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
795				**MLE method failed to converge properly**						Mean in Log Scale	-2.818	

796											SD in Log Scale	0.296
797											Mean in Original Scale	0.0623
798											SD in Original Scale	0.0187
799											95% Percentile Bootstrap UCL	0.0687
800											95% BCA Bootstrap UCL	0.0691
801												
802	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
803					k star (bias corrected)	8.226	**Data appear Normal at 5% Significance Level**					
804					Theta Star	0.00763						
805					nu star	246.8						
806												
807					A-D Test Statistic	0.346	**Nonparametric Statistics**					
808					5% A-D Critical Value	0.737	Kaplan-Meier (KM) Method					
809					K-S Test Statistic	0.737	Mean	0.0628				
810					5% K-S Critical Value	0.222	SD	0.0201				
811	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00536				
812							95% KM (t) UCL	0.072				
813	**Assuming Gamma Distribution**						95% KM (z) UCL	0.0716				
814	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0721				
815					Minimum	0.034	95% KM (bootstrap t) UCL	0.0723				
816					Maximum	0.11	95% KM (BCA) UCL	0.0716				
817					Mean	0.0633	95% KM (Percentile Bootstrap) UCL	0.0714				
818					Median	0.0607	95% KM (Chebyshev) UCL	0.0861				
819					SD	0.0187	97.5% KM (Chebyshev) UCL	0.0962				
820					k star	10.59	99% KM (Chebyshev) UCL	0.116				
821					Theta star	0.00598						
822					Nu star	444.8	**Potential UCLs to Use**					
823					AppChi2	396.9	95% KM (t) UCL	0.072				
824					95% Gamma Approximate UCL	0.071	95% KM (Percentile Bootstrap) UCL	0.0714				
825					95% Adjusted Gamma UCL	0.0716						
826	**Note: DL/2 is not a recommended method.**											
827												
828												
829	**Barium, dissolved (mw-13)**											
830												
831	**General Statistics**											
832					Number of Valid Data	7	Number of Detected Data	5				
833					Number of Distinct Detected Data	5	Number of Non-Detect Data	2				
834							Percent Non-Detects	28.57%				
835												
836	**Raw Statistics**						**Log-transformed Statistics**					
837					Minimum Detected	0.0543	Minimum Detected	-2.913				
838					Maximum Detected	0.071	Maximum Detected	-2.645				
839					Mean of Detected	0.0599	Mean of Detected	-2.821				
840					SD of Detected	0.00692	SD of Detected	0.111				
841					Minimum Non-Detect	0.3	Minimum Non-Detect	-1.204				
842					Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693				
843												
844	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	7				
845	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	0				
846	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	100.00%				
847												
848	**Warning: There are only 5 Detected Values in this data**											

	A	B	C	D	E	F	G	H	I	J	K	L
849	**Note: It should be noted that even though bootstrap may be performed on this data set**											
850	**the resulting calculations may not be reliable enough tp draw conclusions**											
851												
852	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
853												
854												
855	**UCL Statistics**											
856	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
857	Shapiro Wilk Test Statistic					0.854	Shapiro Wilk Test Statistic					0.87
858	5% Shapiro Wilk Critical Value					0.762	5% Shapiro Wilk Critical Value					0.762
859	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
860												
861	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
862	DL/2 Substitution Method						DL/2 Substitution Method					
863	Mean					0.0999	Mean					-2.484
864	SD					0.0744	SD					0.601
865	95% DL/2 (t) UCL					0.155	95% H-Stat (DL/2) UCL					0.467
866												
867	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
868	**MLE method failed to converge properly**						Mean in Log Scale					-2.821
869							SD in Log Scale					0.0906
870							Mean in Original Scale					0.0598
871							SD in Original Scale					0.00565
872							95% Percentile Bootstrap UCL					0.0632
873							95% BCA Bootstrap UCL					0.0641
874												
875	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
876	k star (bias corrected)					39.7	**Data appear Normal at 5% Significance Level**					
877	Theta Star					0.00151						
878	nu star					397						
879												
880	A-D Test Statistic					0.435	**Nonparametric Statistics**					
881	5% A-D Critical Value					0.678	Kaplan-Meier (KM) Method					
882	K-S Test Statistic					0.678	Mean					0.0599
883	5% K-S Critical Value					0.357	SD					0.00619
884	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00309
885							95% KM (t) UCL					0.0659
886	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0649
887	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0661
888	Minimum					0.0543	95% KM (bootstrap t) UCL					0.0814
889	Maximum					0.071	95% KM (BCA) UCL					0.0653
890	Mean					0.0601	95% KM (Percentile Bootstrap) UCL					0.0648
891	Median					0.0608	95% KM (Chebyshev) UCL					0.0733
892	SD					0.00567	97.5% KM (Chebyshev) UCL					0.0792
893	k star					78.62	99% KM (Chebyshev) UCL					0.0906
894	Theta star					0.0007649						
895	Nu star					1101	**Potential UCLs to Use**					
896	AppChi2					1025	95% KM (t) UCL					0.0659
897	95% Gamma Approximate UCL					0.0646	95% KM (Percentile Bootstrap) UCL					0.0648
898	95% Adjusted Gamma UCL					0.066						
899	**Note: DL/2 is not a recommended method.**											
900												
901												

902	**Barium, dissolved (mw-14)**											
903												
904	**General Statistics**											
905					Number of Valid Data	7				Number of Detected Data		6
906					Number of Distinct Detected Data	5				Number of Non-Detect Data		1
907										Percent Non-Detects		14.29%
908												
909	**Raw Statistics**						**Log-transformed Statistics**					
910					Minimum Detected	0.0968				Minimum Detected		-2.335
911					Maximum Detected	0.13				Maximum Detected		-2.04
912					Mean of Detected	0.108				Mean of Detected		-2.229
913					SD of Detected	0.0121				SD of Detected		0.108
914					Minimum Non-Detect	0.5				Minimum Non-Detect		-0.693
915					Maximum Non-Detect	0.5				Maximum Non-Detect		-0.693
916												
917												
918	**Warning: There are only 6 Detected Values in this data**											
919	**Note: It should be noted that even though bootstrap may be performed on this data set**											
920	**the resulting calculations may not be reliable enough tp draw conclusions**											
921												
922	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
923												
924												
925	**UCL Statistics**											
926	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
927					Shapiro Wilk Test Statistic	0.869				Shapiro Wilk Test Statistic		0.891
928					5% Shapiro Wilk Critical Value	0.788				5% Shapiro Wilk Critical Value		0.788
929	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
930												
931	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
932					DL/2 Substitution Method					DL/2 Substitution Method		
933					Mean	0.128				Mean		-2.109
934					SD	0.0547				SD		0.333
935					95% DL/2 (t) UCL	0.169				95% H-Stat (DL/2) UCL		0.337
936												
937					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
938	**MLE method failed to converge properly**									Mean in Log Scale		-2.229
939										SD in Log Scale		0.0982
940										Mean in Original Scale		0.108
941										SD in Original Scale		0.0111
942										95% Percentile Bootstrap UCL		0.115
943										95% BCA Bootstrap UCL		0.118
944												
945	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
946					k star (bias corrected)	50.72	**Data appear Normal at 5% Significance Level**					
947					Theta Star	0.00213						
948					nu star	608.6						
949												
950					A-D Test Statistic	0.406	**Nonparametric Statistics**					
951					5% A-D Critical Value	0.696				Kaplan-Meier (KM) Method		
952					K-S Test Statistic	0.696				Mean		0.108
953					5% K-S Critical Value	0.332				SD		0.0111
954	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.00494

955											95% KM (t) UCL	0.118
956	**Assuming Gamma Distribution**										95% KM (z) UCL	0.116
957				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.118
958					Minimum	0.0968					95% KM (bootstrap t) UCL	0.123
959					Maximum	0.13					95% KM (BCA) UCL	0.116
960					Mean	0.108					95% KM (Percentile Bootstrap) UCL	0.117
961					Median	0.11					95% KM (Chebyshev) UCL	0.13
962					SD	0.0111					97.5% KM (Chebyshev) UCL	0.139
963					k star	67.28					99% KM (Chebyshev) UCL	0.157
964					Theta star	0.00161						
965					Nu star	942				**Potential UCLs to Use**		
966					AppChi2	871.7					95% KM (t) UCL	0.118
967				95% Gamma Approximate UCL		0.117					95% KM (Percentile Bootstrap) UCL	0.117
968				95% Adjusted Gamma UCL		0.12						
969	**Note: DL/2 is not a recommended method.**											
970												
971												
972	**Barium, dissolved (mw-15)**											
973												
974	**General Statistics**											
975				Number of Valid Data		6					Number of Detected Data	5
976				Number of Distinct Detected Data		5					Number of Non-Detect Data	1
977											Percent Non-Detects	16.67%
978												
979	**Raw Statistics**									**Log-transformed Statistics**		
980					Minimum Detected	0.052					Minimum Detected	-2.957
981					Maximum Detected	0.12					Maximum Detected	-2.12
982					Mean of Detected	0.0759					Mean of Detected	-2.624
983					SD of Detected	0.0271					SD of Detected	0.33
984					Minimum Non-Detect	0.5					Minimum Non-Detect	-0.693
985					Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693
986												
987												
988	**Warning: There are only 5 Detected Values in this data**											
989	**Note: It should be noted that even though bootstrap may be performed on this data set**											
990	**the resulting calculations may not be reliable enough tp draw conclusions**											
991												
992	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
993												
994												
995	**UCL Statistics**											
996	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
997					Shapiro Wilk Test Statistic	0.884					Shapiro Wilk Test Statistic	0.941
998					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
999	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
1000												
1001	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
1002					DL/2 Substitution Method						DL/2 Substitution Method	
1003					Mean	0.105					Mean	-2.417
1004					SD	0.0751					SD	0.585
1005					95% DL/2 (t) UCL	0.167					95% H-Stat (DL/2) UCL	0.524
1006												
1007					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	

1008	MLE method failed to converge properly									Mean in Log Scale		-2.624
1009										SD in Log Scale		0.295
1010										Mean in Original Scale		0.0754
1011										SD in Original Scale		0.0243
1012										95% Percentile Bootstrap UCL		0.0911
1013										95% BCA Bootstrap UCL		0.0938
1014												
1015	Gamma Distribution Test with Detected Values Only									Data Distribution Test with Detected Values Only		
1016				k star (bias corrected)		4.572				Data appear Normal at 5% Significance Level		
1017				Theta Star		0.0166						
1018				nu star		45.72						
1019												
1020				A-D Test Statistic		0.302				Nonparametric Statistics		
1021				5% A-D Critical Value		0.679				Kaplan-Meier (KM) Method		
1022				K-S Test Statistic		0.679				Mean		0.0759
1023				5% K-S Critical Value		0.358				SD		0.0242
1024	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		0.0121
1025										95% KM (t) UCL		0.1
1026	Assuming Gamma Distribution									95% KM (z) UCL		0.0959
1027				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.101
1028				Minimum		0.052				95% KM (bootstrap t) UCL		0.122
1029				Maximum		0.12				95% KM (BCA) UCL		0.095
1030				Mean		0.0764				95% KM (Percentile Bootstrap) UCL		0.0964
1031				Median		0.0744				95% KM (Chebyshev) UCL		0.129
1032				SD		0.0242				97.5% KM (Chebyshev) UCL		0.152
1033				k star		6.735				99% KM (Chebyshev) UCL		0.196
1034				Theta star		0.0113						
1035				Nu star		80.82				Potential UCLs to Use		
1036				AppChi2		61.11				95% KM (t) UCL		0.1
1037				95% Gamma Approximate UCL		0.101				95% KM (Percentile Bootstrap) UCL		0.0964
1038				95% Adjusted Gamma UCL		0.112						
1039	Note: DL/2 is not a recommended method.											
1040												
1041												
1042	Barium, dissolved (mw-19)											
1043												
1044	General Statistics											
1045				Number of Valid Data		5				Number of Detected Data		4
1046				Number of Distinct Detected Data		4				Number of Non-Detect Data		1
1047										Percent Non-Detects		20.00%
1048												
1049	Raw Statistics									Log-transformed Statistics		
1050				Minimum Detected		0.076				Minimum Detected		-2.577
1051				Maximum Detected		0.086				Maximum Detected		-2.453
1052				Mean of Detected		0.0808				Mean of Detected		-2.517
1053				SD of Detected		0.00412				SD of Detected		0.0509
1054				Minimum Non-Detect		0.5				Minimum Non-Detect		-0.693
1055				Maximum Non-Detect		0.5				Maximum Non-Detect		-0.693
1056												
1057												
1058	Warning: There are only 4 Distinct Detected Values in this data											
1059	Note: It should be noted that even though bootstrap may be performed on this data set											
1060	the resulting calculations may not be reliable enough tp draw conclusions											

	A	B	C	D	E	F	G	H	I	J	K	L
1061												
1062	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1063												
1064												
1065	**UCL Statistics**											
1066	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1067	Shapiro Wilk Test Statistic					0.983	Shapiro Wilk Test Statistic					0.985
1068	5% Shapiro Wilk Critical Value					0.748	5% Shapiro Wilk Critical Value					0.748
1069	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1070												
1071	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1072	DL/2 Substitution Method						DL/2 Substitution Method					
1073	Mean					0.115	Mean					-2.291
1074	SD					0.0758	SD					0.507
1075	95% DL/2 (t) UCL					0.187	95% H-Stat (DL/2) UCL					1.414
1076												
1077	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1078	**MLE method failed to converge properly**						Mean in Log Scale					-2.517
1079							SD in Log Scale					0.044
1080							Mean in Original Scale					0.0808
1081							SD in Original Scale					0.00357
1082							95% Percentile Bootstrap UCL					0.083
1083							95% BCA Bootstrap UCL					0.083
1084												
1085	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1086	k star (bias corrected)					128.9	**Data appear Normal at 5% Significance Level**					
1087	Theta Star					0.0006269						
1088	nu star					1031						
1089												
1090	A-D Test Statistic					0.231	**Nonparametric Statistics**					
1091	5% A-D Critical Value					0.657	Kaplan-Meier (KM) Method					
1092	K-S Test Statistic					0.657	Mean					0.0808
1093	5% K-S Critical Value					0.394	SD					0.00357
1094	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00206
1095							95% KM (t) UCL					0.0852
1096	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0842
1097	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0853
1098	Minimum					0.076	95% KM (bootstrap t) UCL					0.0858
1099	Maximum					0.086	95% KM (BCA) UCL					0.0836
1100	Mean					0.0809	95% KM (Percentile Bootstrap) UCL					0.0838
1101	Median					0.0812	95% KM (Chebyshev) UCL					0.0898
1102	SD					0.00358	97.5% KM (Chebyshev) UCL					0.0937
1103	k star					256.2	99% KM (Chebyshev) UCL					0.101
1104	Theta star					0.0003158						
1105	Nu star					2562	**Potential UCLs to Use**					
1106	AppChi2					2446	95% KM (t) UCL					0.0852
1107	95% Gamma Approximate UCL					0.0848	95% KM (Percentile Bootstrap) UCL					0.0838
1108	95% Adjusted Gamma UCL					N/A						
1109	**Note: DL/2 is not a recommended method.**											
1110												
1111												
1112	**Barium, dissolved (mw-20-100)**											
1113												

	A	B	C	D	E	F	G	H	I	J	K	L
1114	**General Statistics**											
1115					Number of Valid Data	5				Number of Detected Data		4
1116					Number of Distinct Detected Data	4				Number of Non-Detect Data		1
1117										Percent Non-Detects		20.00%
1118												
1119	**Raw Statistics**						**Log-transformed Statistics**					
1120					Minimum Detected	0.025				Minimum Detected		-3.689
1121					Maximum Detected	0.042				Maximum Detected		-3.17
1122					Mean of Detected	0.0325				Mean of Detected		-3.444
1123					SD of Detected	0.00705				SD of Detected		0.213
1124					Minimum Non-Detect	0.5				Minimum Non-Detect		-0.693
1125					Maximum Non-Detect	0.5				Maximum Non-Detect		-0.693
1126												
1127												
1128	**Warning: There are only 4 Distinct Detected Values in this data**											
1129	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1130	**the resulting calculations may not be reliable enough tp draw conclusions**											
1131												
1132	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1133												
1134												
1135	**UCL Statistics**											
1136	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1137					Shapiro Wilk Test Statistic	0.942				Shapiro Wilk Test Statistic		0.964
1138					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value		0.748
1139	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1140												
1141	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1142					DL/2 Substitution Method					DL/2 Substitution Method		
1143					Mean	0.076				Mean		-3.032
1144					SD	0.0975				SD		0.938
1145					95% DL/2 (t) UCL	0.169				95% H-Stat (DL/2) UCL		7.355
1146												
1147					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1148	**MLE method failed to converge properly**									Mean in Log Scale		-3.444
1149										SD in Log Scale		0.184
1150										Mean in Original Scale		0.0324
1151										SD in Original Scale		0.00611
1152										95% Percentile Bootstrap UCL		0.0364
1153										95% BCA Bootstrap UCL		0.0376
1154												
1155	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1156					k star (bias corrected)	7.487	**Data appear Normal at 5% Significance Level**					
1157					Theta Star	0.00434						
1158					nu star	59.9						
1159												
1160					A-D Test Statistic	0.29	**Nonparametric Statistics**					
1161					5% A-D Critical Value	0.657				Kaplan-Meier (KM) Method		
1162					K-S Test Statistic	0.657				Mean		0.0325
1163					5% K-S Critical Value	0.394				SD		0.0061
1164	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.00352
1165										95% KM (t) UCL		0.04
1166	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0383

1167	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL		0.0403
1168					Minimum	0.025				95% KM (bootstrap t) UCL		0.0447
1169					Maximum	0.042				95% KM (BCA) UCL		0.0378
1170					Mean	0.0327				95% KM (Percentile Bootstrap) UCL		0.0378
1171					Median	0.032				95% KM (Chebyshev) UCL		0.0479
1172					SD	0.00611				97.5% KM (Chebyshev) UCL		0.0545
1173					k star	14.71				99% KM (Chebyshev) UCL		0.0676
1174					Theta star	0.00222						
1175					Nu star	147.1				**Potential UCLs to Use**		
1176					AppChi2	120.1				95% KM (t) UCL		0.04
1177				95% Gamma Approximate UCL		0.04				95% KM (Percentile Bootstrap) UCL		0.0378
1178				95% Adjusted Gamma UCL		N/A						
1179	**Note: DL/2 is not a recommended method.**											
1180												
1181												
1182	**Barium, dissolved (mw-20-130)**											
1183												
1184	**General Statistics**											
1185				Number of Valid Data		16				Number of Detected Data		13
1186				Number of Distinct Detected Data		12				Number of Non-Detect Data		3
1187										Percent Non-Detects		18.75%
1188												
1189	**Raw Statistics**						**Log-transformed Statistics**					
1190				Minimum Detected		0.0215				Minimum Detected		-3.84
1191				Maximum Detected		0.049				Maximum Detected		-3.016
1192				Mean of Detected		0.0302				Mean of Detected		-3.53
1193				SD of Detected		0.00834				SD of Detected		0.248
1194				Minimum Non-Detect		0.3				Minimum Non-Detect		-1.204
1195				Maximum Non-Detect		0.5				Maximum Non-Detect		-0.693
1196												
1197	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		16
1198	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1199	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1200												
1201	**UCL Statistics**											
1202	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1203				Shapiro Wilk Test Statistic		0.79				Shapiro Wilk Test Statistic		0.834
1204				5% Shapiro Wilk Critical Value		0.866				5% Shapiro Wilk Critical Value		0.866
1205	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1206												
1207	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1208				DL/2 Substitution Method						DL/2 Substitution Method		
1209				Mean		0.0589				Mean		-3.192
1210				SD		0.0657				SD		0.768
1211				95% DL/2 (t) UCL		0.0877				95% H-Stat (DL/2) UCL		0.185
1212												
1213				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
1214	**MLE method failed to converge properly**									Mean in Log Scale		-3.53
1215										SD in Log Scale		0.226
1216										Mean in Original Scale		0.0301
1217										SD in Original Scale		0.00756
1218										95% Percentile Bootstrap UCL		0.0333
1219										95% BCA Bootstrap UCL		0.0338

1220												
1221	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1222					k star (bias corrected)	12.78	**Data do not follow a Discernable Distribution (0.05)**					
1223					Theta Star	0.00236						
1224					nu star	332.3						
1225												
1226					A-D Test Statistic	1.221	**Nonparametric Statistics**					
1227					5% A-D Critical Value	0.733	Kaplan-Meier (KM) Method					
1228					K-S Test Statistic	0.733	Mean	0.0302				
1229					5% K-S Critical Value	0.236	SD	0.00801				
1230	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00231				
1231							95% KM (t) UCL	0.0343				
1232	**Assuming Gamma Distribution**						95% KM (z) UCL	0.034				
1233	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0343				
1234					Minimum	0.0215	95% KM (bootstrap t) UCL	0.0362				
1235					Maximum	0.049	95% KM (BCA) UCL	0.0341				
1236					Mean	0.0304	95% KM (Percentile Bootstrap) UCL	0.034				
1237					Median	0.0268	95% KM (Chebyshev) UCL	0.0403				
1238					SD	0.00757	97.5% KM (Chebyshev) UCL	0.0446				
1239					k star	16.06	99% KM (Chebyshev) UCL	0.0532				
1240					Theta star	0.00189						
1241					Nu star	513.9	**Potential UCLs to Use**					
1242					AppChi2	462.3	95% KM (Chebyshev) UCL	0.0403				
1243					95% Gamma Approximate UCL	0.0338						
1244					95% Adjusted Gamma UCL	0.0342						
1245	**Note: DL/2 is not a recommended method.**											
1246												
1247												
1248	**Barium, dissolved (mw-20-70)**											
1249												
1250	**General Statistics**											
1251					Number of Valid Data	17	Number of Detected Data	14				
1252					Number of Distinct Detected Data	13	Number of Non-Detect Data	3				
1253							Percent Non-Detects	17.65%				
1254												
1255	**Raw Statistics**						**Log-transformed Statistics**					
1256					Minimum Detected	0.033	Minimum Detected	-3.411				
1257					Maximum Detected	0.0591	Maximum Detected	-2.829				
1258					Mean of Detected	0.0439	Mean of Detected	-3.15				
1259					SD of Detected	0.00988	SD of Detected	0.222				
1260					Minimum Non-Detect	0.3	Minimum Non-Detect	-1.204				
1261					Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693				
1262												
1263	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	17				
1264	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	0				
1265	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	100.00%				
1266												
1267	**UCL Statistics**											
1268	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1269					Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Test Statistic	0.846				
1270					5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874				
1271	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1272												

	A	B	C	D	E	F	G	H	I	J	K	L
1273	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1274					DL/2 Substitution Method						DL/2 Substitution Method	
1275					Mean	0.0685					Mean	-2.899
1276					SD	0.0592					SD	0.603
1277					95% DL/2 (t) UCL	0.0935					95% H-Stat (DL/2) UCL	0.138
1278												
1279					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1280	**MLE method failed to converge properly**										Mean in Log Scale	-3.15
1281											SD in Log Scale	0.204
1282											Mean in Original Scale	0.0437
1283											SD in Original Scale	0.00905
1284											95% Percentile Bootstrap UCL	0.0471
1285											95% BCA Bootstrap UCL	0.0477
1286												
1287	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1288					k star (bias corrected)	17.15	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
1289					Theta Star	0.00256						
1290					nu star	480.2						
1291												
1292					A-D Test Statistic	1.035	**Nonparametric Statistics**					
1293					5% A-D Critical Value	0.734					Kaplan-Meier (KM) Method	
1294					K-S Test Statistic	0.734					Mean	0.0439
1295					5% K-S Critical Value	0.228					SD	0.00952
1296	**Data follow Appr. Gamma Distribution at 5% Significance Level**										SE of Mean	0.00264
1297											95% KM (t) UCL	0.0485
1298	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0482
1299					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0485
1300					Minimum	0.033					95% KM (bootstrap t) UCL	0.049
1301					Maximum	0.0591					95% KM (BCA) UCL	0.0484
1302					Mean	0.0441					95% KM (Percentile Bootstrap) UCL	0.0482
1303					Median	0.0409					95% KM (Chebyshev) UCL	0.0554
1304					SD	0.00905					97.5% KM (Chebyshev) UCL	0.0603
1305					k star	21.09					99% KM (Chebyshev) UCL	0.0701
1306					Theta star	0.00209						
1307					Nu star	717.2	**Potential UCLs to Use**					
1308					AppChi2	656					95% KM (BCA) UCL	0.0484
1309					95% Gamma Approximate UCL	0.0482						
1310					95% Adjusted Gamma UCL	0.0487						
1311	**Note: DL/2 is not a recommended method.**											
1312												
1313												
1314	**Barium, dissolved (mw-21)**											
1315												
1316	**General Statistics**											
1317					Number of Valid Data	8					Number of Detected Data	3
1318					Number of Distinct Detected Data	3					Number of Non-Detect Data	5
1319											Percent Non-Detects	62.50%
1320												
1321	**Raw Statistics**						**Log-transformed Statistics**					
1322					Minimum Detected	0.037					Minimum Detected	-3.297
1323					Maximum Detected	0.042					Maximum Detected	-3.17
1324					Mean of Detected	0.04					Mean of Detected	-3.22
1325					SD of Detected	0.00265					SD of Detected	0.0673

1326					Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
1327					Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693
1328												
1329	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
1330	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1331	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1332												
1333	**Warning: There are only 3 Distinct Detected Values in this data set**											
1334	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1335	**Those methods will return a 'N/A' value on your output display!**											
1336												
1337	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1338	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1339												
1340												
1341	**UCL Statistics**											
1342	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1343	Shapiro Wilk Test Statistic					0.893	Shapiro Wilk Test Statistic					0.886
1344	5% Shapiro Wilk Critical Value					0.767	5% Shapiro Wilk Critical Value					0.767
1345	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1346												
1347	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1348	DL/2 Substitution Method						DL/2 Substitution Method					
1349	Mean					0.134	Mean					-2.266
1350	SD					0.088	SD					0.819
1351	95% DL/2 (t) UCL					0.193	95% H-Stat (DL/2) UCL					0.688
1352												
1353	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1354	**MLE method failed to converge properly**						Mean in Log Scale					-3.22
1355							SD in Log Scale					0.0539
1356							Mean in Original Scale					0.04
1357							SD in Original Scale					0.00214
1358							95% Percentile Bootstrap UCL					0.0411
1359							95% BCA Bootstrap UCL					0.0411
1360												
1361	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1362	k star (bias corrected)					N/A	**Data appear Normal at 5% Significance Level**					
1363	Theta Star					N/A						
1364	nu star					N/A						
1365												
1366	A-D Test Statistic					0.406	**Nonparametric Statistics**					
1367	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
1368	K-S Test Statistic					N/A	Mean					0.04
1369	5% K-S Critical Value					N/A	SD					0.00216
1370	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.00153
1371							95% KM (t) UCL					0.0429
1372	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0425
1373	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0433
1374	Minimum					N/A	95% KM (bootstrap t) UCL					0.0431
1375	Maximum					N/A	95% KM (BCA) UCL					N/A
1376	Mean					N/A	95% KM (Percentile Bootstrap) UCL					0.042
1377	Median					N/A	95% KM (Chebyshev) UCL					0.0467
1378	SD					N/A	97.5% KM (Chebyshev) UCL					0.0495

1379					k star	N/A				99% KM (Chebyshev) UCL		0.0552
1380					Theta star	N/A						
1381					Nu star	N/A				**Potential UCLs to Use**		
1382					AppChi2	N/A				95% KM (t) UCL		0.0429
1383				95% Gamma Approximate UCL		N/A				95% KM (Percentile Bootstrap) UCL		0.042
1384				95% Adjusted Gamma UCL		N/A						
1385	**Warning: Recommended UCL exceeds the maximum observation**											
1386	**Note: DL/2 is not a recommended method.**											
1387												
1388												
1389	**Barium, dissolved (mw-22)**											
1390												
1391	**General Statistics**											
1392					Number of Valid Data	7				Number of Detected Data		3
1393					Number of Distinct Detected Data	3				Number of Non-Detect Data		4
1394										Percent Non-Detects		57.14%
1395												
1396	**Raw Statistics**						**Log-transformed Statistics**					
1397					Minimum Detected	0.11				Minimum Detected		-2.207
1398					Maximum Detected	0.5				Maximum Detected		-0.693
1399					Mean of Detected	0.253				Mean of Detected		-1.599
1400					SD of Detected	0.215				SD of Detected		0.8
1401					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
1402					Maximum Non-Detect	0.5				Maximum Non-Detect		-0.693
1403												
1404	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		6
1405	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
1406	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		85.71%
1407												
1408	**Warning: There are only 3 Distinct Detected Values in this data set**											
1409	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1410	**Those methods will return a 'N/A' value on your output display!**											
1411												
1412	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1413	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1414												
1415												
1416	**UCL Statistics**											
1417	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1418					Shapiro Wilk Test Statistic	0.826				Shapiro Wilk Test Statistic		0.896
1419					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
1420	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1421												
1422	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1423					DL/2 Substitution Method					DL/2 Substitution Method		
1424					Mean	0.209				Mean		-1.696
1425					SD	0.135				SD		0.504
1426					95% DL/2 (t) UCL	0.308				95% H-Stat (DL/2) UCL		0.277
1427												
1428					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1429	**MLE method failed to converge properly**									Mean in Log Scale		-1.843
1430										SD in Log Scale		0.575
1431										Mean in Original Scale		0.188

1432											SD in Original Scale	0.143
1433											95% Percentile Bootstrap UCL	0.28
1434											95% BCA Bootstrap UCL	0.32
1435												
1436	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
1437					k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**	
1438					Theta Star	N/A						
1439					nu star	N/A						
1440												
1441					A-D Test Statistic	0.431					**Nonparametric Statistics**	
1442					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
1443					K-S Test Statistic	N/A					Mean	0.183
1444					5% K-S Critical Value	N/A					SD	0.131
1445	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0617
1446											95% KM (t) UCL	0.303
1447	**Assuming Gamma Distribution**										95% KM (z) UCL	0.284
1448					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.294
1449					Minimum	N/A					95% KM (bootstrap t) UCL	0.571
1450					Maximum	N/A					95% KM (BCA) UCL	0.5
1451					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.5
1452					Median	N/A					95% KM (Chebyshev) UCL	0.452
1453					SD	N/A					97.5% KM (Chebyshev) UCL	0.568
1454					k star	N/A					99% KM (Chebyshev) UCL	0.797
1455					Theta star	N/A						
1456					Nu star	N/A					**Potential UCLs to Use**	
1457					AppChi2	N/A					95% KM (t) UCL	0.303
1458					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.5
1459					95% Adjusted Gamma UCL	N/A						
1460	**Note: DL/2 is not a recommended method.**											
1461												
1462												
1463	**Barium, dissolved (mw-23)**											
1464												
1465	**General Statistics**											
1466					Number of Valid Data	8					Number of Detected Data	3
1467					Number of Distinct Detected Data	3					Number of Non-Detect Data	5
1468											Percent Non-Detects	62.50%
1469												
1470	**Raw Statistics**										**Log-transformed Statistics**	
1471					Minimum Detected	0.089					Minimum Detected	-2.419
1472					Maximum Detected	5.3					Maximum Detected	1.668
1473					Mean of Detected	1.89					Mean of Detected	-0.675
1474					SD of Detected	2.955					SD of Detected	2.108
1475					Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
1476					Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693
1477												
1478	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	7
1479	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
1480	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	87.50%
1481												
1482	**Warning: There are only 3 Distinct Detected Values in this data set**											
1483	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1484	**Those methods will return a 'N/A' value on your output display!**											

	A	B	C	D	E	F	G	H	I	J	K	L
1485												
1486	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
1487	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
1488												
1489												
1490	UCL Statistics											
1491	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1492					Shapiro Wilk Test Statistic	0.777				Shapiro Wilk Test Statistic		0.94
1493					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
1494	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1495												
1496	Assuming Normal Distribution						Assuming Lognormal Distribution					
1497					DL/2 Substitution Method					DL/2 Substitution Method		
1498					Mean	0.827				Mean		-1.311
1499					SD	1.808				SD		1.262
1500					95% DL/2 (t) UCL	2.039				95% H-Stat (DL/2) UCL		1.684
1501												
1502					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1503	MLE method failed to converge properly									Mean in Log Scale		-1.387
1504										SD in Log Scale		1.475
1505										Mean in Original Scale		0.853
1506										SD in Original Scale		1.804
1507										95% Percentile Bootstrap UCL		2.085
1508										95% BCA Bootstrap UCL		2.724
1509												
1510	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1511					k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level					
1512					Theta Star	N/A						
1513					nu star	N/A						
1514												
1515					A-D Test Statistic	0.401	Nonparametric Statistics					
1516					5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method					
1517					K-S Test Statistic	N/A				Mean		0.824
1518					5% K-S Critical Value	N/A				SD		1.694
1519	Data not Gamma Distributed at 5% Significance Level									SE of Mean		0.736
1520										95% KM (t) UCL		2.219
1521	Assuming Gamma Distribution									95% KM (z) UCL		2.035
1522					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		2.053
1523					Minimum	N/A				95% KM (bootstrap t) UCL		11.42
1524					Maximum	N/A				95% KM (BCA) UCL		5.3
1525					Mean	N/A				95% KM (Percentile Bootstrap) UCL		5.3
1526					Median	N/A				95% KM (Chebyshev) UCL		4.033
1527					SD	N/A				97.5% KM (Chebyshev) UCL		5.421
1528					k star	N/A				99% KM (Chebyshev) UCL		8.148
1529					Theta star	N/A						
1530					Nu star	N/A	Potential UCLs to Use					
1531					AppChi2	N/A				95% KM (t) UCL		2.219
1532					95% Gamma Approximate UCL	N/A				95% KM (Percentile Bootstrap) UCL		5.3
1533					95% Adjusted Gamma UCL	N/A						
1534	Note: DL/2 is not a recommended method.											
1535												
1536												
1537	Barium, dissolved (mw-24a)											

1538												
1539	**General Statistics**											
1540					Number of Valid Data	7				Number of Detected Data		4
1541					Number of Distinct Detected Data	4				Number of Non-Detect Data		3
1542										Percent Non-Detects		42.86%
1543												
1544	**Raw Statistics**							**Log-transformed Statistics**				
1545					Minimum Detected	0.026				Minimum Detected		-3.65
1546					Maximum Detected	0.944				Maximum Detected		-0.0576
1547					Mean of Detected	0.262				Mean of Detected		-2.543
1548					SD of Detected	0.455				SD of Detected		1.669
1549					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
1550					Maximum Non-Detect	0.5				Maximum Non-Detect		-0.693
1551												
1552	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		6
1553	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
1554	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		85.71%
1555												
1556	**Warning: There are only 4 Distinct Detected Values in this data**											
1557	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1558	**the resulting calculations may not be reliable enough tp draw conclusions**											
1559												
1560	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1561												
1562												
1563	**UCL Statistics**											
1564	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
1565					Shapiro Wilk Test Statistic	0.643				Shapiro Wilk Test Statistic		0.737
1566					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value		0.748
1567	**Data not Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**				
1568												
1569	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
1570					DL/2 Substitution Method					DL/2 Substitution Method		
1571					Mean	0.228				Mean		-2.193
1572					SD	0.326				SD		1.27
1573					95% DL/2 (t) UCL	0.468				95% H-Stat (DL/2) UCL		5.923
1574												
1575					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1576	**MLE method failed to converge properly**									Mean in Log Scale		-2.82
1577										SD in Log Scale		1.277
1578										Mean in Original Scale		0.17
1579										SD in Original Scale		0.342
1580										95% Percentile Bootstrap UCL		0.425
1581										95% BCA Bootstrap UCL		0.437
1582												
1583	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
1584					k star (bias corrected)	0.298		**Data do not follow a Discernable Distribution (0.05)**				
1585					Theta Star	0.881						
1586					nu star	2.381						
1587												
1588					A-D Test Statistic	0.8		**Nonparametric Statistics**				
1589					5% A-D Critical Value	0.68				Kaplan-Meier (KM) Method		
1590					K-S Test Statistic	0.68				Mean		0.165

1591				5% K-S Critical Value	0.41					SD	0.318
1592	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.139
1593										95% KM (t) UCL	0.435
1594	**Assuming Gamma Distribution**									95% KM (z) UCL	0.393
1595				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.417
1596				Minimum	0.026					95% KM (bootstrap t) UCL	7.951
1597				Maximum	0.944					95% KM (BCA) UCL	0.427
1598				Mean	0.263					95% KM (Percentile Bootstrap) UCL	0.427
1599				Median	0.131					95% KM (Chebyshev) UCL	0.77
1600				SD	0.329					97.5% KM (Chebyshev) UCL	1.032
1601				k star	0.561					99% KM (Chebyshev) UCL	1.547
1602				Theta star	0.469						
1603				Nu star	7.859					**Potential UCLs to Use**	
1604				AppChi2	2.654					99% KM (Chebyshev) UCL	1.547
1605				95% Gamma Approximate UCL	0.779						
1606				95% Adjusted Gamma UCL	N/A						
1607	**Warning: Recommended UCL exceeds the maximum observation**										
1608	**Note: DL/2 is not a recommended method.**										
1609											
1610											
1611	**Barium, dissolved (mw-24b)**										
1612											
1613	**General Statistics**										
1614				Number of Valid Data	5					Number of Detected Data	4
1615				Number of Distinct Detected Data	4					Number of Non-Detect Data	1
1616										Percent Non-Detects	20.00%
1617											
1618	**Raw Statistics**									**Log-transformed Statistics**	
1619				Minimum Detected	0.028					Minimum Detected	-3.576
1620				Maximum Detected	0.0386					Maximum Detected	-3.255
1621				Mean of Detected	0.0342					Mean of Detected	-3.384
1622				SD of Detected	0.00451					SD of Detected	0.138
1623				Minimum Non-Detect	0.5					Minimum Non-Detect	-0.693
1624				Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693
1625											
1626											
1627	**Warning: There are only 4 Distinct Detected Values in this data**										
1628	**Note: It should be noted that even though bootstrap may be performed on this data set**										
1629	**the resulting calculations may not be reliable enough tp draw conclusions**										
1630											
1631	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**										
1632											
1633											
1634	**UCL Statistics**										
1635	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**	
1636				Shapiro Wilk Test Statistic	0.951					Shapiro Wilk Test Statistic	0.929
1637				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
1638	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**	
1639											
1640	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
1641				DL/2 Substitution Method						DL/2 Substitution Method	
1642				Mean	0.0773					Mean	-2.984
1643				SD	0.0966					SD	0.901

1644				95% DL/2 (t) UCL	0.169					95% H-Stat (DL/2) UCL		7.401
1645												
1646				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1647				**MLE method failed to converge properly**						Mean in Log Scale		-3.384
1648										SD in Log Scale		0.119
1649										Mean in Original Scale		0.0341
1650										SD in Original Scale		0.00391
1651										95% Percentile Bootstrap UCL		0.0366
1652										95% BCA Bootstrap UCL		0.0362
1653												
1654				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1655				k star (bias corrected)	18.25					**Data appear Normal at 5% Significance Level**		
1656				Theta Star	0.00187							
1657				nu star	146							
1658												
1659				A-D Test Statistic	0.306					**Nonparametric Statistics**		
1660				5% A-D Critical Value	0.656					Kaplan-Meier (KM) Method		
1661				K-S Test Statistic	0.656					Mean		0.0342
1662				5% K-S Critical Value	0.394					SD		0.00391
1663				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		0.00226
1664										95% KM (t) UCL		0.039
1665				**Assuming Gamma Distribution**						95% KM (z) UCL		0.0379
1666				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0391
1667				Minimum	0.028					95% KM (bootstrap t) UCL		0.0383
1668				Maximum	0.0386					95% KM (BCA) UCL		0.037
1669				Mean	0.0343					95% KM (Percentile Bootstrap) UCL		0.0372
1670				Median	0.0347					95% KM (Chebyshev) UCL		0.044
1671				SD	0.00392					97.5% KM (Chebyshev) UCL		0.0482
1672				k star	36.13					99% KM (Chebyshev) UCL		0.0566
1673				Theta star	0.0009485							
1674				Nu star	361.3					**Potential UCLs to Use**		
1675				AppChi2	318.2					95% KM (t) UCL		0.039
1676				95% Gamma Approximate UCL	0.0389					95% KM (Percentile Bootstrap) UCL		0.0372
1677				95% Adjusted Gamma UCL	N/A							
1678				**Warning: Recommended UCL exceeds the maximum observation**								
1679	**Note: DL/2 is not a recommended method.**											
1680												
1681												
1682	**Barium, dissolved (mw-24br)**											
1683												
1684				**General Statistics**								
1685				Number of Valid Data	4					Number of Detected Data		3
1686				Number of Distinct Detected Data	3					Number of Non-Detect Data		1
1687										Percent Non-Detects		25.00%
1688												
1689				**Warning: This data set only has 4 observations!**								
1690				**Data set is too small to compute reliable and meaningful statistics and estimates!**								
1691				**The data set for variable Barium, dissolved (mw-24br) was not processed!**								
1692												
1693				**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**								
1694				**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**								
1695												
1696												

1697												
1698	**Barium, dissolved (mw-25)**											
1699												
1700	**General Statistics**											
1701					Number of Valid Data	14			Number of Detected Data	11		
1702					Number of Distinct Detected Data	10			Number of Non-Detect Data	3		
1703									Percent Non-Detects	21.43%		
1704												
1705	**Raw Statistics**						**Log-transformed Statistics**					
1706					Minimum Detected	0.037			Minimum Detected	-3.297		
1707					Maximum Detected	0.0489			Maximum Detected	-3.018		
1708					Mean of Detected	0.0408			Mean of Detected	-3.201		
1709					SD of Detected	0.00326			SD of Detected	0.0766		
1710					Minimum Non-Detect	0.3			Minimum Non-Detect	-1.204		
1711					Maximum Non-Detect	0.5			Maximum Non-Detect	-0.693		
1712												
1713	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	14		
1714	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	0		
1715	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	100.00%		
1716												
1717	**UCL Statistics**											
1718	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1719					Shapiro Wilk Test Statistic	0.873			Shapiro Wilk Test Statistic	0.901		
1720					5% Shapiro Wilk Critical Value	0.85			5% Shapiro Wilk Critical Value	0.85		
1721	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1722												
1723	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1724					DL/2 Substitution Method				DL/2 Substitution Method			
1725					Mean	0.0714			Mean	-2.885		
1726					SD	0.0648			SD	0.642		
1727					95% DL/2 (t) UCL	0.102			95% H-Stat (DL/2) UCL	0.223		
1728												
1729					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
1730	**MLE method failed to converge properly**								Mean in Log Scale	-3.201		
1731									SD in Log Scale	0.0687		
1732									Mean in Original Scale	0.0408		
1733									SD in Original Scale	0.00292		
1734									95% Percentile Bootstrap UCL	0.0421		
1735									95% BCA Bootstrap UCL	0.0424		
1736												
1737	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1738					k star (bias corrected)	133	**Data appear Normal at 5% Significance Level**					
1739					Theta Star	0.000307						
1740					nu star	2925						
1741												
1742					A-D Test Statistic	0.447	**Nonparametric Statistics**					
1743					5% A-D Critical Value	0.726			Kaplan-Meier (KM) Method			
1744					K-S Test Statistic	0.726			Mean	0.0408		
1745					5% K-S Critical Value	0.254			SD	0.00311		
1746	**Data appear Gamma Distributed at 5% Significance Level**								SE of Mean	0.0009831		
1747									95% KM (t) UCL	0.0426		
1748	**Assuming Gamma Distribution**								95% KM (z) UCL	0.0424		
1749					Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL	0.0426		

1750				Minimum	0.037				95% KM (bootstrap t) UCL			0.0436
1751				Maximum	0.0489				95% KM (BCA) UCL			0.0425
1752				Mean	0.0409				95% KM (Percentile Bootstrap) UCL			0.0425
1753				Median	0.0408				95% KM (Chebyshev) UCL			0.0451
1754				SD	0.00292				97.5% KM (Chebyshev) UCL			0.047
1755				k star	175.6				99% KM (Chebyshev) UCL			0.0506
1756				Theta star	0.000233							
1757				Nu star	4917				**Potential UCLs to Use**			
1758				AppChi2	4755				95% KM (t) UCL			0.0426
1759				95% Gamma Approximate UCL	0.0423				95% KM (Percentile Bootstrap) UCL			0.0425
1760				95% Adjusted Gamma UCL	0.0425							
1761	**Note: DL/2 is not a recommended method.**											
1762												
1763												
1764	**Barium, dissolved (mw-26)**											
1765												
1766	**General Statistics**											
1767				Number of Valid Data	7				Number of Detected Data			3
1768				Number of Distinct Detected Data	3				Number of Non-Detect Data			4
1769									Percent Non-Detects			57.14%
1770												
1771	**Raw Statistics**					**Log-transformed Statistics**						
1772				Minimum Detected	0.036				Minimum Detected			-3.324
1773				Maximum Detected	0.17				Maximum Detected			-1.772
1774				Mean of Detected	0.0817				Mean of Detected			-2.78
1775				SD of Detected	0.0765				SD of Detected			0.874
1776				Minimum Non-Detect	0.3				Minimum Non-Detect			-1.204
1777				Maximum Non-Detect	0.5				Maximum Non-Detect			-0.693
1778												
1779	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			7
1780	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			0
1781	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
1782												
1783	**Warning: There are only 3 Distinct Detected Values in this data set**											
1784	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1785	**Those methods will return a 'N/A' value on your output display!**											
1786												
1787	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1788	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1789												
1790												
1791	**UCL Statistics**											
1792	**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**						
1793				Shapiro Wilk Test Statistic	0.767				Shapiro Wilk Test Statistic			0.789
1794				5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value			0.767
1795	**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**						
1796												
1797	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
1798				DL/2 Substitution Method					DL/2 Substitution Method			
1799				Mean	0.149				Mean			-2.13
1800				SD	0.0873				SD			0.818
1801				95% DL/2 (t) UCL	0.213				95% H-Stat (DL/2) UCL			0.483
1802												

1803	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1804	**MLE method failed to converge properly**						Mean in Log Scale					-2.78
1805							SD in Log Scale					0.647
1806							Mean in Original Scale					0.0749
1807							SD in Original Scale					0.0517
1808							95% Percentile Bootstrap UCL					0.104
1809							95% BCA Bootstrap UCL					0.112
1810												
1811	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1812	k star (bias corrected)					N/A	**Data appear Lognormal at 5% Significance Level**					
1813	Theta Star					N/A						
1814	nu star					N/A						
1815												
1816	A-D Test Statistic					0.571	**Nonparametric Statistics**					
1817	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
1818	K-S Test Statistic					N/A	Mean					0.0817
1819	5% K-S Critical Value					N/A	SD					0.0625
1820	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0442
1821							95% KM (t) UCL					0.168
1822	**Assuming Gamma Distribution**						95% KM (z) UCL					0.154
1823	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.179
1824	Minimum					N/A	95% KM (bootstrap t) UCL					2.727
1825	Maximum					N/A	95% KM (BCA) UCL					0.17
1826	Mean					N/A	95% KM (Percentile Bootstrap) UCL					N/A
1827	Median					N/A	95% KM (Chebyshev) UCL					0.274
1828	SD					N/A	97.5% KM (Chebyshev) UCL					0.358
1829	k star					N/A	99% KM (Chebyshev) UCL					0.521
1830	Theta star					N/A						
1831	Nu star					N/A	**Potential UCLs to Use**					
1832	AppChi2					N/A	95% KM (t) UCL					0.168
1833	95% Gamma Approximate UCL					N/A	95% KM (% Bootstrap) UCL					N/A
1834	95% Adjusted Gamma UCL					N/A						
1835	**Note: DL/2 is not a recommended method.**											
1836												
1837												
1838	**Barium, dissolved (mw-27-20)**											
1839												
1840	**General Statistics**											
1841	Number of Valid Data					4	Number of Detected Data					3
1842	Number of Distinct Detected Data					3	Number of Non-Detect Data					1
1843							Percent Non-Detects					25.00%
1844												
1845	**Warning: This data set only has 4 observations!**											
1846	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1847	**The data set for variable Barium, dissolved (mw-27-20) was not processed!**											
1848												
1849	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1850	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1851												
1852												
1853												
1854	**Barium, dissolved (mw-27-60)**											
1855												

	A	B	C	D	E	F	G	H	I	J	K	L
1856	General Statistics											
1857					Number of Valid Data	2				Number of Detected Data		0
1858					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
1859										Percent Non-Detects		100.00%
1860												
1861	Warning: This data set only has 2 observations!											
1862	Data set is too small to compute reliable and meaningful statistics and estimates!											
1863	The data set for variable Barium, dissolved (mw-27-60) was not processed!											
1864												
1865	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1866	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1867												
1868												
1869												
1870	Barium, dissolved (mw-27-85)											
1871												
1872	General Statistics											
1873					Number of Valid Data	2				Number of Detected Data		0
1874					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
1875										Percent Non-Detects		100.00%
1876												
1877	Warning: This data set only has 2 observations!											
1878	Data set is too small to compute reliable and meaningful statistics and estimates!											
1879	The data set for variable Barium, dissolved (mw-27-85) was not processed!											
1880												
1881	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1882	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1883												
1884												
1885												
1886	Barium, dissolved (mw-28-25)											
1887												
1888	General Statistics											
1889					Number of Valid Data	4				Number of Detected Data		3
1890					Number of Distinct Detected Data	3				Number of Non-Detect Data		1
1891										Percent Non-Detects		25.00%
1892												
1893	Warning: This data set only has 4 observations!											
1894	Data set is too small to compute reliable and meaningful statistics and estimates!											
1895	The data set for variable Barium, dissolved (mw-28-25) was not processed!											
1896												
1897	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1898	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1899												
1900												
1901												
1902	Barium, dissolved (mw-28-90)											
1903												
1904	General Statistics											
1905					Number of Valid Observations	1				Number of Distinct Observations		1
1906												
1907												
1908	Warning: This data set only has 1 observations!											

1909	Data set is too small to compute reliable and meaningful statistics and estimates!											
1910	The data set for variable Barium, dissolved (mw-28-90) was not processed!											
1911												
1912	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1913	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1914												
1915												
1916												
1917	Barium, dissolved (mw-29)											
1918												
1919	General Statistics											
1920						Number of Valid Data	4			Number of Detected Data	3	
1921						Number of Distinct Detected Data	3			Number of Non-Detect Data	1	
1922										Percent Non-Detects	25.00%	
1923												
1924	Warning: This data set only has 4 observations!											
1925	Data set is too small to compute reliable and meaningful statistics and estimates!											
1926	The data set for variable Barium, dissolved (mw-29) was not processed!											
1927												
1928	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1929	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1930												
1931												
1932												
1933	Barium, dissolved (mw-3)											
1934												
1935	General Statistics											
1936						Number of Valid Observations	2			Number of Distinct Observations	2	
1937												
1938												
1939	Warning: This data set only has 2 observations!											
1940	Data set is too small to compute reliable and meaningful statistics and estimates!											
1941	The data set for variable Barium, dissolved (mw-3) was not processed!											
1942												
1943	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1944	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1945												
1946												
1947												
1948	Barium, dissolved (mw-30-30)											
1949												
1950	General Statistics											
1951						Number of Valid Data	5			Number of Detected Data	4	
1952						Number of Distinct Detected Data	4			Number of Non-Detect Data	1	
1953										Percent Non-Detects	20.00%	
1954												
1955	Raw Statistics									Log-transformed Statistics		
1956						Minimum Detected	0.083			Minimum Detected	-2.489	
1957						Maximum Detected	1.1			Maximum Detected	0.0953	
1958						Mean of Detected	0.413			Mean of Detected	-1.423	
1959						SD of Detected	0.476			SD of Detected	1.211	
1960						Minimum Non-Detect	0.5			Minimum Non-Detect	-0.693	
1961						Maximum Non-Detect	0.5			Maximum Non-Detect	-0.693	

	A	B	C	D	E	F	G	H	I	J	K	L
1962												
1963												
1964	**Warning: There are only 4 Distinct Detected Values in this data**											
1965	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1966	**the resulting calculations may not be reliable enough tp draw conclusions**											
1967												
1968	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1969												
1970												
1971	**UCL Statistics**											
1972	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1973	Shapiro Wilk Test Statistic					0.814	Shapiro Wilk Test Statistic					0.905
1974	5% Shapiro Wilk Critical Value					0.748	5% Shapiro Wilk Critical Value					0.748
1975	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1976												
1977	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1978	DL/2 Substitution Method						DL/2 Substitution Method					
1979	Mean					0.381	Mean					-1.415
1980	SD					0.419	SD					1.049
1981	95% DL/2 (t) UCL					0.78	95% H-Stat (DL/2) UCL					2.862
1982												
1983	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1984	**MLE method failed to converge properly**						Mean in Log Scale					-1.518
1985							SD in Log Scale					1.07
1986							Mean in Original Scale					0.361
1987							SD in Original Scale					0.429
1988							95% Percentile Bootstrap UCL					0.697
1989							95% BCA Bootstrap UCL					0.754
1990												
1991	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1992	k star (bias corrected)					0.433	**Data appear Normal at 5% Significance Level**					
1993	Theta Star					0.955						
1994	nu star					3.46						
1995												
1996	A-D Test Statistic					0.379	**Nonparametric Statistics**					
1997	5% A-D Critical Value					0.666	Kaplan-Meier (KM) Method					
1998	K-S Test Statistic					0.666	Mean					0.367
1999	5% K-S Critical Value					0.402	SD					0.385
2000	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.202
2001							95% KM (t) UCL					0.797
2002	**Assuming Gamma Distribution**						95% KM (z) UCL					0.699
2003	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.79
2004	Minimum					0.083	95% KM (bootstrap t) UCL					11.71
2005	Maximum					1.1	95% KM (BCA) UCL					0.697
2006	Mean					0.411	95% KM (Percentile Bootstrap) UCL					0.693
2007	Median					0.37	95% KM (Chebyshev) UCL					1.247
2008	SD					0.413	97.5% KM (Chebyshev) UCL					1.627
2009	k star					0.654	99% KM (Chebyshev) UCL					2.375
2010	Theta star					0.628						
2011	Nu star					6.537	**Potential UCLs to Use**					
2012	AppChi2					1.92	95% KM (t) UCL					0.797
2013	95% Gamma Approximate UCL					1.398	95% KM (Percentile Bootstrap) UCL					0.693
2014	95% Adjusted Gamma UCL					N/A						

2015	**Note: DL/2 is not a recommended method.**											
2016												
2017												
2018	**Barium, dissolved (mw-30-50)**											
2019												
2020	**General Statistics**											
2021						Number of Valid Data	1			Number of Detected Data	0	
2022						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
2023										Percent Non-Detects	100.00%	
2024												
2025	**Warning: This data set only has 1 observations!**											
2026	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2027	**The data set for variable Barium, dissolved (mw-30-50) was not processed!**											
2028												
2029	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2030	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2031												
2032												
2033												
2034	**Barium, dissolved (mw-31-135)**											
2035												
2036	**General Statistics**											
2037						Number of Valid Observations	2			Number of Distinct Observations	2	
2038												
2039												
2040	**Warning: This data set only has 2 observations!**											
2041	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2042	**The data set for variable Barium, dissolved (mw-31-135) was not processed!**											
2043												
2044	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2045	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2046												
2047												
2048												
2049	**Barium, dissolved (mw-31-60)**											
2050												
2051	**General Statistics**											
2052						Number of Valid Data	6			Number of Detected Data	4	
2053						Number of Distinct Detected Data	4			Number of Non-Detect Data	2	
2054										Percent Non-Detects	33.33%	
2055												
2056	**Raw Statistics**									**Log-transformed Statistics**		
2057						Minimum Detected	0.0357			Minimum Detected	-3.333	
2058						Maximum Detected	0.054			Maximum Detected	-2.919	
2059						Mean of Detected	0.0444			Mean of Detected	-3.127	
2060						SD of Detected	0.00817			SD of Detected	0.185	
2061						Minimum Non-Detect	0.3			Minimum Non-Detect	-1.204	
2062						Maximum Non-Detect	0.5			Maximum Non-Detect	-0.693	
2063												
2064	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	6	
2065	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
2066	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
2067												

2068	**Warning: There are only 4 Distinct Detected Values in this data**											
2069	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2070	**the resulting calculations may not be reliable enough tp draw conclusions**											
2071												
2072	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2073												
2074												
2075	**UCL Statistics**											
2076	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2077				Shapiro Wilk Test Statistic	0.968					Shapiro Wilk Test Statistic	0.97	
2078				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748	
2079	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2080												
2081	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2082				DL/2 Substitution Method						DL/2 Substitution Method		
2083				Mean	0.0963					Mean	-2.632	
2084				SD	0.0866					SD	0.797	
2085				95% DL/2 (t) UCL	0.167					95% H-Stat (DL/2) UCL	1.306	
2086												
2087				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2088	**MLE method failed to converge properly**									Mean in Log Scale	-3.127	
2089										SD in Log Scale	0.143	
2090										Mean in Original Scale	0.0442	
2091										SD in Original Scale	0.00633	
2092										95% Percentile Bootstrap UCL	0.0483	
2093										95% BCA Bootstrap UCL	0.0483	
2094												
2095	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2096				k star (bias corrected)	10.01		**Data appear Normal at 5% Significance Level**					
2097				Theta Star	0.00444							
2098				nu star	80.11							
2099												
2100				A-D Test Statistic	0.246		**Nonparametric Statistics**					
2101				5% A-D Critical Value	0.656					Kaplan-Meier (KM) Method		
2102				K-S Test Statistic	0.656					Mean	0.0444	
2103				5% K-S Critical Value	0.394					SD	0.00707	
2104	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00408	
2105										95% KM (t) UCL	0.0527	
2106	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0511	
2107				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0531	
2108				Minimum	0.0357					95% KM (bootstrap t) UCL	0.0536	
2109				Maximum	0.054					95% KM (BCA) UCL	0.0505	
2110				Mean	0.0448					95% KM (Percentile Bootstrap) UCL	0.0507	
2111				Median	0.0455					95% KM (Chebyshev) UCL	0.0622	
2112				SD	0.00635					97.5% KM (Chebyshev) UCL	0.0699	
2113				k star	29.41					99% KM (Chebyshev) UCL	0.0851	
2114				Theta star	0.00152							
2115				Nu star	352.9		**Potential UCLs to Use**					
2116				AppChi2	310.4					95% KM (t) UCL	0.0527	
2117				95% Gamma Approximate UCL	0.0509					95% KM (Percentile Bootstrap) UCL	0.0507	
2118				95% Adjusted Gamma UCL	N/A							
2119	**Note: DL/2 is not a recommended method.**											
2120												

	A	B	C	D	E	F	G	H	I	J	K	L
2121												
2122	**Barium, dissolved (mw-32-20)**											
2123												
2124						**General Statistics**						
2125					Number of Valid Observations	1			Number of Distinct Observations	1		
2126												
2127												
2128						**Warning: This data set only has 1 observations!**						
2129						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
2130						**The data set for variable Barium, dissolved (mw-32-20) was not processed!**						
2131												
2132						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
2133						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
2134												
2135												
2136												
2137	**Barium, dissolved (mw-32-35)**											
2138												
2139						**General Statistics**						
2140					Number of Valid Data	4			Number of Detected Data	0		
2141					Number of Distinct Detected Data	0			Number of Non-Detect Data	4		
2142									Percent Non-Detects	100.00%		
2143												
2144						**Warning: This data set only has 4 observations!**						
2145						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
2146						**The data set for variable Barium, dissolved (mw-32-35) was not processed!**						
2147												
2148						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
2149						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
2150												
2151												
2152												
2153	**Barium, dissolved (mw-33-150)**											
2154												
2155						**General Statistics**						
2156					Number of Valid Data	1			Number of Detected Data	0		
2157					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
2158									Percent Non-Detects	100.00%		
2159												
2160						**Warning: This data set only has 1 observations!**						
2161						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
2162						**The data set for variable Barium, dissolved (mw-33-150) was not processed!**						
2163												
2164						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
2165						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
2166												
2167												
2168												
2169	**Barium, dissolved (mw-33-210)**											
2170												
2171						**General Statistics**						
2172					Number of Valid Data	3			Number of Detected Data	1		
2173					Number of Distinct Detected Data	1			Number of Non-Detect Data	2		

2174											Percent Non-Detects	66.67%
2175												
2176	Warning: This data set only has 3 observations!											
2177	Data set is too small to compute reliable and meaningful statistics and estimates!											
2178	The data set for variable Barium, dissolved (mw-33-210) was not processed!											
2179												
2180	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2181	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2182												
2183												
2184												
2185	Barium, dissolved (mw-33-40)											
2186												
2187	General Statistics											
2188						Number of Valid Data	2				Number of Detected Data	1
2189						Number of Distinct Detected Data	1				Number of Non-Detect Data	1
2190											Percent Non-Detects	50.00%
2191												
2192	Warning: This data set only has 2 observations!											
2193	Data set is too small to compute reliable and meaningful statistics and estimates!											
2194	The data set for variable Barium, dissolved (mw-33-40) was not processed!											
2195												
2196	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2197	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2198												
2199												
2200												
2201	Barium, dissolved (mw-33-90)											
2202												
2203	General Statistics											
2204						Number of Valid Data	3				Number of Detected Data	2
2205						Number of Distinct Detected Data	2				Number of Non-Detect Data	1
2206											Percent Non-Detects	33.33%
2207												
2208	Warning: This data set only has 3 observations!											
2209	Data set is too small to compute reliable and meaningful statistics and estimates!											
2210	The data set for variable Barium, dissolved (mw-33-90) was not processed!											
2211												
2212	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2213	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2214												
2215												
2216												
2217	Barium, dissolved (mw-34-100)											
2218												
2219	General Statistics											
2220						Number of Valid Data	4				Number of Detected Data	2
2221						Number of Distinct Detected Data	2				Number of Non-Detect Data	2
2222											Percent Non-Detects	50.00%
2223												
2224	Warning: This data set only has 4 observations!											
2225	Data set is too small to compute reliable and meaningful statistics and estimates!											
2226	The data set for variable Barium, dissolved (mw-34-100) was not processed!											

	A	B	C	D	E	F	G	H	I	J	K	L
2227												
2228	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2229	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2230												
2231												
2232												
2233	**Barium, dissolved (mw-34-55)**											
2234												
2235	**General Statistics**											
2236					Number of Valid Data	10			Number of Detected Data	7		
2237					Number of Distinct Detected Data	7			Number of Non-Detect Data	3		
2238									Percent Non-Detects	30.00%		
2239												
2240	**Raw Statistics**						**Log-transformed Statistics**					
2241					Minimum Detected	0.0186			Minimum Detected	-3.985		
2242					Maximum Detected	0.0876			Maximum Detected	-2.435		
2243					Mean of Detected	0.0619			Mean of Detected	-2.877		
2244					SD of Detected	0.0236			SD of Detected	0.532		
2245					Minimum Non-Detect	0.3			Minimum Non-Detect	-1.204		
2246					Maximum Non-Detect	0.5			Maximum Non-Detect	-0.693		
2247												
2248	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	10		
2249	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	0		
2250	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	100.00%		
2251												
2252	**Warning: There are only 7 Detected Values in this data**											
2253	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2254	**the resulting calculations may not be reliable enough tp draw conclusions**											
2255												
2256	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2257												
2258												
2259	**UCL Statistics**											
2260	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2261					Shapiro Wilk Test Statistic	0.931			Shapiro Wilk Test Statistic	0.803		
2262					5% Shapiro Wilk Critical Value	0.803			5% Shapiro Wilk Critical Value	0.803		
2263	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2264												
2265	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2266					DL/2 Substitution Method				DL/2 Substitution Method			
2267					Mean	0.0984			Mean	-2.532		
2268					SD	0.0675			SD	0.719		
2269					95% DL/2 (t) UCL	0.137			95% H-Stat (DL/2) UCL	0.571		
2270												
2271					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
2272	**MLE method failed to converge properly**								Mean in Log Scale	-2.877		
2273									SD in Log Scale	0.451		
2274									Mean in Original Scale	0.0606		
2275									SD in Original Scale	0.0206		
2276									95% Percentile Bootstrap UCL	0.0701		
2277									95% BCA Bootstrap UCL	0.07		
2278												
2279	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					

2280					k star (bias corrected)	3.167		**Data appear Normal at 5% Significance Level**				
2281					Theta Star	0.0196						
2282					nu star	44.34						
2283												
2284					A-D Test Statistic	0.516		**Nonparametric Statistics**				
2285					5% A-D Critical Value	0.71				Kaplan-Meier (KM) Method		
2286					K-S Test Statistic	0.71				Mean		0.0619
2287					5% K-S Critical Value	0.313				SD		0.0219
2288	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.00893
2289										95% KM (t) UCL		0.0783
2290	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0766
2291				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0787
2292					Minimum	0.0186				95% KM (bootstrap t) UCL		0.076
2293					Maximum	0.0876				95% KM (BCA) UCL		0.075
2294					Mean	0.0626				95% KM (Percentile Bootstrap) UCL		0.0752
2295					Median	0.066				95% KM (Chebyshev) UCL		0.101
2296					SD	0.0203				97.5% KM (Chebyshev) UCL		0.118
2297					k star	5.061				99% KM (Chebyshev) UCL		0.151
2298					Theta star	0.0124						
2299					Nu star	101.2		**Potential UCLs to Use**				
2300					AppChi2	79				95% KM (t) UCL		0.0783
2301					95% Gamma Approximate UCL	0.0802				95% KM (Percentile Bootstrap) UCL		0.0752
2302					95% Adjusted Gamma UCL	0.0839						
2303	**Note: DL/2 is not a recommended method.**											
2304												
2305												
2306	**Barium, dissolved (mw-34-80)**											
2307												
2308						**General Statistics**						
2309					Number of Valid Data	15				Number of Detected Data		11
2310					Number of Distinct Detected Data	10				Number of Non-Detect Data		4
2311										Percent Non-Detects		26.67%
2312												
2313					**Raw Statistics**					**Log-transformed Statistics**		
2314					Minimum Detected	0.0299				Minimum Detected		-3.51
2315					Maximum Detected	0.0541				Maximum Detected		-2.917
2316					Mean of Detected	0.0409				Mean of Detected		-3.219
2317					SD of Detected	0.00895				SD of Detected		0.221
2318					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
2319					Maximum Non-Detect	0.5				Maximum Non-Detect		-0.693
2320												
2321	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		15
2322	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
2323	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
2324												
2325						**UCL Statistics**							
2326	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
2327					Shapiro Wilk Test Statistic	0.911				Shapiro Wilk Test Statistic		0.912
2328					5% Shapiro Wilk Critical Value	0.85				5% Shapiro Wilk Critical Value		0.85
2329	**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
2330												
2331	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
2332					DL/2 Substitution Method					DL/2 Substitution Method		

2333					Mean	0.0833					Mean	-2.798
2334					SD	0.0779					SD	0.758
2335					95% DL/2 (t) UCL	0.119					95% H-Stat (DL/2) UCL	0.295
2336												
2337					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2338					**MLE method failed to converge properly**						Mean in Log Scale	-3.219
2339											SD in Log Scale	0.196
2340											Mean in Original Scale	0.0407
2341											SD in Original Scale	0.00793
2342											95% Percentile Bootstrap UCL	0.0439
2343											95% BCA Bootstrap UCL	0.0442
2344												
2345					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
2346					k star (bias corrected)	16.68					**Data appear Normal at 5% Significance Level**	
2347					Theta Star	0.00245						
2348					nu star	367						
2349												
2350					A-D Test Statistic	0.41					**Nonparametric Statistics**	
2351					5% A-D Critical Value	0.729					Kaplan-Meier (KM) Method	
2352					K-S Test Statistic	0.729					Mean	0.0409
2353					5% K-S Critical Value	0.255					SD	0.00854
2354					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0027
2355											95% KM (t) UCL	0.0457
2356					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0453
2357					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0457
2358					Minimum	0.0299					95% KM (bootstrap t) UCL	0.0458
2359					Maximum	0.0541					95% KM (BCA) UCL	0.0454
2360					Mean	0.0412					95% KM (Percentile Bootstrap) UCL	0.0451
2361					Median	0.0396					95% KM (Chebyshev) UCL	0.0527
2362					SD	0.00793					97.5% KM (Chebyshev) UCL	0.0578
2363					k star	22.86					99% KM (Chebyshev) UCL	0.0678
2364					Theta star	0.0018						
2365					Nu star	685.9					**Potential UCLs to Use**	
2366					AppChi2	626.1					95% KM (t) UCL	0.0457
2367					95% Gamma Approximate UCL	0.0452					95% KM (Percentile Bootstrap) UCL	0.0451
2368					95% Adjusted Gamma UCL	0.0457						
2369	**Note: DL/2 is not a recommended method.**											
2370												
2371												
2372	**Barium, dissolved (mw-35-135)**											
2373												
2374						**General Statistics**						
2375					Number of Valid Observations	3					Number of Distinct Observations	3
2376												
2377												
2378						**Warning: This data set only has 3 observations!**						
2379						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
2380						**The data set for variable Barium, dissolved (mw-35-135) was not processed!**						
2381												
2382						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
2383						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
2384												
2385												

	A	B	C	D	E	F	G	H	I	J	K	L
2386												
2387	**Barium, dissolved (mw-35-60)**											
2388												
2389	**General Statistics**											
2390	Number of Valid Observations					2	Number of Distinct Observations					2
2391												
2392												
2393	**Warning: This data set only has 2 observations!**											
2394	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2395	**The data set for variable Barium, dissolved (mw-35-60) was not processed!**											
2396												
2397	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2398	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2399												
2400												
2401												
2402	**Barium, dissolved (mw-36-100)**											
2403												
2404	**General Statistics**											
2405	Number of Valid Observations					1	Number of Distinct Observations					1
2406												
2407												
2408	**Warning: This data set only has 1 observations!**											
2409	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2410	**The data set for variable Barium, dissolved (mw-36-100) was not processed!**											
2411												
2412	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2413	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2414												
2415												
2416												
2417	**Barium, dissolved (mw-36-20)**											
2418												
2419	**General Statistics**											
2420	Number of Valid Observations					1	Number of Distinct Observations					1
2421												
2422												
2423	**Warning: This data set only has 1 observations!**											
2424	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2425	**The data set for variable Barium, dissolved (mw-36-20) was not processed!**											
2426												
2427	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2428	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2429												
2430												
2431												
2432	**Barium, dissolved (mw-36-40)**											
2433												
2434	**General Statistics**											
2435	Number of Valid Observations					1	Number of Distinct Observations					1
2436												
2437												
2438	**Warning: This data set only has 1 observations!**											

	A	B	C	D	E	F	G	H	I	J	K	L
2439	Data set is too small to compute reliable and meaningful statistics and estimates!											
2440	The data set for variable Barium, dissolved (mw-36-40) was not processed!											
2441												
2442	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2443	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2444												
2445												
2446												
2447	Barium, dissolved (mw-36-50)											
2448												
2449	General Statistics											
2450	Number of Valid Observations	1				Number of Distinct Observations	1					
2451												
2452												
2453	Warning: This data set only has 1 observations!											
2454	Data set is too small to compute reliable and meaningful statistics and estimates!											
2455	The data set for variable Barium, dissolved (mw-36-50) was not processed!											
2456												
2457	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2458	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2459												
2460												
2461												
2462	Barium, dissolved (mw-36-70)											
2463												
2464	General Statistics											
2465	Number of Valid Observations	1				Number of Distinct Observations	1					
2466												
2467												
2468	Warning: This data set only has 1 observations!											
2469	Data set is too small to compute reliable and meaningful statistics and estimates!											
2470	The data set for variable Barium, dissolved (mw-36-70) was not processed!											
2471												
2472	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2473	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2474												
2475												
2476												
2477	Barium, dissolved (mw-36-90)											
2478												
2479	General Statistics											
2480	Number of Valid Observations	1				Number of Distinct Observations	1					
2481												
2482												
2483	Warning: This data set only has 1 observations!											
2484	Data set is too small to compute reliable and meaningful statistics and estimates!											
2485	The data set for variable Barium, dissolved (mw-36-90) was not processed!											
2486												
2487	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2488	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2489												
2490												
2491												

	A	B	C	D	E	F	G	H	I	J	K	L
2492	**Barium, dissolved (mw-37d)**											
2493												
2494					**General Statistics**							
2495					Number of Valid Data	13				Number of Detected Data		11
2496					Number of Distinct Detected Data	11				Number of Non-Detect Data		2
2497										Percent Non-Detects		15.38%
2498												
2499					**Raw Statistics**					**Log-transformed Statistics**		
2500					Minimum Detected	0.0398				Minimum Detected		-3.224
2501					Maximum Detected	0.0659				Maximum Detected		-2.72
2502					Mean of Detected	0.048				Mean of Detected		-3.05
2503					SD of Detected	0.00854				SD of Detected		0.17
2504					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
2505					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
2506												
2507												
2508					**UCL Statistics**							
2509					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
2510					Shapiro Wilk Test Statistic	0.857				Shapiro Wilk Test Statistic		0.871
2511					5% Shapiro Wilk Critical Value	0.85				5% Shapiro Wilk Critical Value		0.85
2512					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
2513												
2514					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
2515					DL/2 Substitution Method					DL/2 Substitution Method		
2516					Mean	0.0637				Mean		-2.873
2517					SD	0.0391				SD		0.46
2518					95% DL/2 (t) UCL	0.083				95% H-Stat (DL/2) UCL		0.139
2519												
2520					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
2521					**MLE method failed to converge properly**					Mean in Log Scale		-3.05
2522										SD in Log Scale		0.159
2523										Mean in Original Scale		0.0479
2524										SD in Original Scale		0.00796
2525										95% Percentile Bootstrap UCL		0.0517
2526										95% BCA Bootstrap UCL		0.0519
2527												
2528					**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**		
2529					k star (bias corrected)	27.03				**Data appear Normal at 5% Significance Level**		
2530					Theta Star	0.00178						
2531					nu star	594.7						
2532												
2533					A-D Test Statistic	0.681				**Nonparametric Statistics**		
2534					5% A-D Critical Value	0.729				Kaplan-Meier (KM) Method		
2535					K-S Test Statistic	0.729				Mean		0.048
2536					5% K-S Critical Value	0.255				SD		0.00814
2537					**Data appear Gamma Distributed at 5% Significance Level**					SE of Mean		0.00258
2538										95% KM (t) UCL		0.0526
2539					**Assuming Gamma Distribution**					95% KM (z) UCL		0.0522
2540					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.0526
2541					Minimum	0.0398				95% KM (bootstrap t) UCL		0.0541
2542					Maximum	0.0659				95% KM (BCA) UCL		0.0524
2543					Mean	0.0482				95% KM (Percentile Bootstrap) UCL		0.0522
2544					Median	0.0454				95% KM (Chebyshev) UCL		0.0592

2545				SD	0.00795				97.5% KM (Chebyshev) UCL			0.0641
2546				k star	32.44				99% KM (Chebyshev) UCL			0.0736
2547				Theta star	0.00148							
2548				Nu star	843.5				**Potential UCLs to Use**			
2549				AppChi2	777.1				95% KM (t) UCL			0.0526
2550				95% Gamma Approximate UCL	0.0523				95% KM (Percentile Bootstrap) UCL			0.0522
2551				95% Adjusted Gamma UCL	0.0529							
2552	**Note: DL/2 is not a recommended method.**											
2553												
2554												
2555	**Barium, dissolved (mw-37s)**											
2556												
2557	**General Statistics**											
2558				Number of Valid Observations	2				Number of Distinct Observations			2
2559												
2560												
2561	**Warning: This data set only has 2 observations!**											
2562	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2563	**The data set for variable Barium, dissolved (mw-37s) was not processed!**											
2564												
2565	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2566	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2567												
2568												
2569												
2570	**Barium, dissolved (mw-38d)**											
2571												
2572	**General Statistics**											
2573				Number of Valid Observations	2				Number of Distinct Observations			2
2574												
2575												
2576	**Warning: This data set only has 2 observations!**											
2577	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2578	**The data set for variable Barium, dissolved (mw-38d) was not processed!**											
2579												
2580	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2581	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2582												
2583												
2584												
2585	**Barium, dissolved (mw-38s)**											
2586												
2587	**General Statistics**											
2588				Number of Valid Observations	2				Number of Distinct Observations			2
2589												
2590												
2591	**Warning: This data set only has 2 observations!**											
2592	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2593	**The data set for variable Barium, dissolved (mw-38s) was not processed!**											
2594												
2595	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2596	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2597												

	A	B	C	D	E	F	G	H	I	J	K	L
2598												
2599												
2600	**Barium, dissolved (mw-39-100)**											
2601												
2602						**General Statistics**						
2603					Number of Valid Observations	1			Number of Distinct Observations	1		
2604												
2605												
2606						**Warning: This data set only has 1 observations!**						
2607						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
2608						**The data set for variable Barium, dissolved (mw-39-100) was not processed!**						
2609												
2610						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
2611						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
2612												
2613												
2614												
2615	**Barium, dissolved (mw-39-40)**											
2616												
2617						**General Statistics**						
2618					Number of Valid Observations	1			Number of Distinct Observations	1		
2619												
2620												
2621						**Warning: This data set only has 1 observations!**						
2622						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
2623						**The data set for variable Barium, dissolved (mw-39-40) was not processed!**						
2624												
2625						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
2626						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
2627												
2628												
2629												
2630	**Barium, dissolved (mw-39-50)**											
2631												
2632						**General Statistics**						
2633					Number of Valid Observations	1			Number of Distinct Observations	1		
2634												
2635												
2636						**Warning: This data set only has 1 observations!**						
2637						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
2638						**The data set for variable Barium, dissolved (mw-39-50) was not processed!**						
2639												
2640						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
2641						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
2642												
2643												
2644												
2645	**Barium, dissolved (mw-39-60)**											
2646												
2647						**General Statistics**						
2648					Number of Valid Observations	2			Number of Distinct Observations	2		
2649												
2650												

	A	B	C	D	E	F	G	H	I	J	K	L
2651	Warning: This data set only has 2 observations!											
2652	Data set is too small to compute reliable and meaningful statistics and estimates!											
2653	The data set for variable Barium, dissolved (mw-39-60) was not processed!											
2654												
2655	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2656	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2657												
2658												
2659												
2660	Barium, dissolved (mw-39-70)											
2661												
2662	General Statistics											
2663	Number of Valid Observations	1				Number of Distinct Observations	1					
2664												
2665												
2666	Warning: This data set only has 1 observations!											
2667	Data set is too small to compute reliable and meaningful statistics and estimates!											
2668	The data set for variable Barium, dissolved (mw-39-70) was not processed!											
2669												
2670	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2671	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2672												
2673												
2674												
2675	Barium, dissolved (mw-39-80)											
2676												
2677	General Statistics											
2678	Number of Valid Observations	1				Number of Distinct Observations	1					
2679												
2680												
2681	Warning: This data set only has 1 observations!											
2682	Data set is too small to compute reliable and meaningful statistics and estimates!											
2683	The data set for variable Barium, dissolved (mw-39-80) was not processed!											
2684												
2685	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2686	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2687												
2688												
2689												
2690	Barium, dissolved (mw-4)											
2691												
2692	General Statistics											
2693	Number of Valid Observations	2				Number of Distinct Observations	2					
2694												
2695												
2696	Warning: This data set only has 2 observations!											
2697	Data set is too small to compute reliable and meaningful statistics and estimates!											
2698	The data set for variable Barium, dissolved (mw-4) was not processed!											
2699												
2700	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2701	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2702												
2703												

	A	B	C	D	E	F	G	H	I	J	K	L
2704												
2705	**Barium, dissolved (mw-40d)**											
2706												
2707	**General Statistics**											
2708	Number of Valid Observations					2	Number of Distinct Observations					2
2709												
2710												
2711	**Warning: This data set only has 2 observations!**											
2712	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2713	**The data set for variable Barium, dissolved (mw-40d) was not processed!**											
2714												
2715	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2716	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2717												
2718												
2719												
2720	**Barium, dissolved (mw-40s)**											
2721												
2722	**General Statistics**											
2723	Number of Valid Observations					2	Number of Distinct Observations					2
2724												
2725												
2726	**Warning: This data set only has 2 observations!**											
2727	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2728	**The data set for variable Barium, dissolved (mw-40s) was not processed!**											
2729												
2730	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2731	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2732												
2733												
2734												
2735	**Barium, dissolved (mw-42-30)**											
2736												
2737	**General Statistics**											
2738	Number of Valid Data					2	Number of Detected Data					0
2739	Number of Distinct Detected Data					0	Number of Non-Detect Data					2
2740							Percent Non-Detects					100.00%
2741												
2742	**Warning: This data set only has 2 observations!**											
2743	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2744	**The data set for variable Barium, dissolved (mw-42-30) was not processed!**											
2745												
2746	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2747	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2748												
2749												
2750												
2751	**Barium, dissolved (mw-42-55)**											
2752												
2753	**General Statistics**											
2754	Number of Valid Data					2	Number of Detected Data					0
2755	Number of Distinct Detected Data					0	Number of Non-Detect Data					2
2756							Percent Non-Detects					100.00%

	A	B	C	D	E	F	G	H	I	J	K	L
2757												
2758	Warning: This data set only has 2 observations!											
2759	Data set is too small to compute reliable and meaningful statistics and estimates!											
2760	The data set for variable Barium, dissolved (mw-42-55) was not processed!											
2761												
2762	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2763	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2764												
2765												
2766												
2767	Barium, dissolved (mw-42-65)											
2768												
2769	General Statistics											
2770	Number of Valid Data					2	Number of Detected Data					0
2771	Number of Distinct Detected Data					0	Number of Non-Detect Data					2
2772							Percent Non-Detects					100.00%
2773												
2774	Warning: This data set only has 2 observations!											
2775	Data set is too small to compute reliable and meaningful statistics and estimates!											
2776	The data set for variable Barium, dissolved (mw-42-65) was not processed!											
2777												
2778	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2779	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2780												
2781												
2782												
2783	Barium, dissolved (mw-43-25)											
2784												
2785	General Statistics											
2786	Number of Valid Data					4	Number of Detected Data					0
2787	Number of Distinct Detected Data					0	Number of Non-Detect Data					4
2788							Percent Non-Detects					100.00%
2789												
2790	Warning: This data set only has 4 observations!											
2791	Data set is too small to compute reliable and meaningful statistics and estimates!											
2792	The data set for variable Barium, dissolved (mw-43-25) was not processed!											
2793												
2794	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2795	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2796												
2797												
2798												
2799	Barium, dissolved (mw-43-75)											
2800												
2801	General Statistics											
2802	Number of Valid Data					1	Number of Detected Data					0
2803	Number of Distinct Detected Data					0	Number of Non-Detect Data					1
2804							Percent Non-Detects					100.00%
2805												
2806	Warning: This data set only has 1 observations!											
2807	Data set is too small to compute reliable and meaningful statistics and estimates!											
2808	The data set for variable Barium, dissolved (mw-43-75) was not processed!											
2809												

	A	B	C	D	E	F	G	H	I	J	K	L
2810	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2811	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2812												
2813												
2814												
2815	Barium, dissolved (mw-43-90)											
2816												
2817	General Statistics											
2818					Number of Valid Data	1			Number of Detected Data	0		
2819					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
2820									Percent Non-Detects	100.00%		
2821												
2822	Warning: This data set only has 1 observations!											
2823	Data set is too small to compute reliable and meaningful statistics and estimates!											
2824	The data set for variable Barium, dissolved (mw-43-90) was not processed!											
2825												
2826	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2827	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2828												
2829												
2830												
2831	Barium, dissolved (mw-44-115)											
2832												
2833	General Statistics											
2834					Number of Valid Data	3			Number of Detected Data	0		
2835					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
2836									Percent Non-Detects	100.00%		
2837												
2838	Warning: This data set only has 3 observations!											
2839	Data set is too small to compute reliable and meaningful statistics and estimates!											
2840	The data set for variable Barium, dissolved (mw-44-115) was not processed!											
2841												
2842	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2843	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2844												
2845												
2846												
2847	Barium, dissolved (mw-44-125)											
2848												
2849	General Statistics											
2850					Number of Valid Observations	1			Number of Distinct Observations	1		
2851												
2852												
2853	Warning: This data set only has 1 observations!											
2854	Data set is too small to compute reliable and meaningful statistics and estimates!											
2855	The data set for variable Barium, dissolved (mw-44-125) was not processed!											
2856												
2857	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2858	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2859												
2860												
2861												
2862	Barium, dissolved (mw-45-095a)											

	A	B	C	D	E	F	G	H	I	J	K	L
2863												
2864	**General Statistics**											
2865	Number of Valid Observations					1	Number of Distinct Observations					1
2866												
2867												
2868	**Warning: This data set only has 1 observations!**											
2869	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2870	**The data set for variable Barium, dissolved (mw-45-095a) was not processed!**											
2871												
2872	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2873	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2874												
2875												
2876												
2877	**Barium, dissolved (mw-46-175)**											
2878												
2879	**General Statistics**											
2880	Number of Valid Observations					1	Number of Distinct Observations					1
2881												
2882												
2883	**Warning: This data set only has 1 observations!**											
2884	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2885	**The data set for variable Barium, dissolved (mw-46-175) was not processed!**											
2886												
2887	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2888	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2889												
2890												
2891												
2892	**Barium, dissolved (mw-47-55)**											
2893												
2894	**General Statistics**											
2895	Number of Valid Observations					1	Number of Distinct Observations					1
2896												
2897												
2898	**Warning: This data set only has 1 observations!**											
2899	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2900	**The data set for variable Barium, dissolved (mw-47-55) was not processed!**											
2901												
2902	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2903	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2904												
2905												
2906												
2907	**Barium, dissolved (mw-48)**											
2908												
2909	**General Statistics**											
2910	Number of Valid Data					3	Number of Detected Data					0
2911	Number of Distinct Detected Data					0	Number of Non-Detect Data					3
2912							Percent Non-Detects					100.00%
2913												
2914	**Warning: This data set only has 3 observations!**											
2915	**Data set is too small to compute reliable and meaningful statistics and estimates!**											

	A	B	C	D	E	F	G	H	I	J	K	L
2916	The data set for variable Barium, dissolved (mw-48) was not processed!											
2917												
2918	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2919	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2920												
2921												
2922												
2923	Barium, dissolved (mw-5)											
2924												
2925	General Statistics											
2926					Number of Valid Observations	2			Number of Distinct Observations	2		
2927												
2928												
2929	Warning: This data set only has 2 observations!											
2930	Data set is too small to compute reliable and meaningful statistics and estimates!											
2931	The data set for variable Barium, dissolved (mw-5) was not processed!											
2932												
2933	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2934	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2935												
2936												
2937												
2938	Barium, dissolved (mw-50-200)											
2939												
2940	General Statistics											
2941					Number of Valid Data	3			Number of Detected Data	0		
2942					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
2943									Percent Non-Detects	100.00%		
2944												
2945	Warning: This data set only has 3 observations!											
2946	Data set is too small to compute reliable and meaningful statistics and estimates!											
2947	The data set for variable Barium, dissolved (mw-50-200) was not processed!											
2948												
2949	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2950	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2951												
2952												
2953												
2954	Barium, dissolved (mw-51)											
2955												
2956	General Statistics											
2957					Number of Valid Data	3			Number of Detected Data	0		
2958					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
2959									Percent Non-Detects	100.00%		
2960												
2961	Warning: This data set only has 3 observations!											
2962	Data set is too small to compute reliable and meaningful statistics and estimates!											
2963	The data set for variable Barium, dissolved (mw-51) was not processed!											
2964												
2965	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2966	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2967												
2968												

	A	B	C	D	E	F	G	H	I	J	K	L
2969												
2970	**Barium, dissolved (mw-6)**											
2971												
2972	**General Statistics**											
2973	Number of Valid Observations					2	Number of Distinct Observations					2
2974												
2975												
2976	**Warning: This data set only has 2 observations!**											
2977	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2978	**The data set for variable Barium, dissolved (mw-6) was not processed!**											
2979												
2980	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2981	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2982												
2983												
2984												
2985	**Barium, dissolved (mw-7)**											
2986												
2987	**General Statistics**											
2988	Number of Valid Observations					2	Number of Distinct Observations					2
2989												
2990												
2991	**Warning: This data set only has 2 observations!**											
2992	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2993	**The data set for variable Barium, dissolved (mw-7) was not processed!**											
2994												
2995	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2996	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2997												
2998												
2999												
3000	**Barium, dissolved (mw-8)**											
3001												
3002	**General Statistics**											
3003	Number of Valid Observations					2	Number of Distinct Observations					2
3004												
3005												
3006	**Warning: This data set only has 2 observations!**											
3007	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3008	**The data set for variable Barium, dissolved (mw-8) was not processed!**											
3009												
3010	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3011	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3012												
3013												
3014												
3015	**Barium, dissolved (mw-9)**											
3016												
3017	**General Statistics**											
3018	Number of Valid Data					7	Number of Detected Data					6
3019	Number of Distinct Detected Data					6	Number of Non-Detect Data					1
3020							Percent Non-Detects					14.29%
3021												

	A	B	C	D	E	F	G	H	I	J	K	L
3022	**Raw Statistics**						**Log-transformed Statistics**					
3023					Minimum Detected	0.0522					Minimum Detected	-2.953
3024					Maximum Detected	0.073					Maximum Detected	-2.617
3025					Mean of Detected	0.061					Mean of Detected	-2.803
3026					SD of Detected	0.00709					SD of Detected	0.114
3027					Minimum Non-Detect	0.5					Minimum Non-Detect	-0.693
3028					Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693
3029												
3030												
3031	**Warning: There are only 6 Detected Values in this data**											
3032	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3033	**the resulting calculations may not be reliable enough tp draw conclusions**											
3034												
3035	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3036												
3037												
3038	**UCL Statistics**											
3039	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3040					Shapiro Wilk Test Statistic	0.951					Shapiro Wilk Test Statistic	0.969
3041					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
3042	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3043												
3044	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3045					DL/2 Substitution Method						DL/2 Substitution Method	
3046					Mean	0.088					Mean	-2.601
3047					SD	0.0717					SD	0.546
3048					95% DL/2 (t) UCL	0.141					95% H-Stat (DL/2) UCL	0.345
3049												
3050					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3051	**MLE method failed to converge properly**										Mean in Log Scale	-2.803
3052											SD in Log Scale	0.104
3053											Mean in Original Scale	0.0609
3054											SD in Original Scale	0.00648
3055											95% Percentile Bootstrap UCL	0.0647
3056											95% BCA Bootstrap UCL	0.0654
3057												
3058	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3059					k star (bias corrected)	45.77	**Data appear Normal at 5% Significance Level**					
3060					Theta Star	0.00133						
3061					nu star	549.2						
3062												
3063					A-D Test Statistic	0.237	**Nonparametric Statistics**					
3064					5% A-D Critical Value	0.696					Kaplan-Meier (KM) Method	
3065					K-S Test Statistic	0.696					Mean	0.061
3066					5% K-S Critical Value	0.332					SD	0.00648
3067	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0029
3068											95% KM (t) UCL	0.0666
3069	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0657
3070					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0667
3071					Minimum	0.0522					95% KM (bootstrap t) UCL	0.0682
3072					Maximum	0.073					95% KM (BCA) UCL	0.0657
3073					Mean	0.0611					95% KM (Percentile Bootstrap) UCL	0.0655
3074					Median	0.0615					95% KM (Chebyshev) UCL	0.0736

3075					SD	0.00649				97.5% KM (Chebyshev) UCL		0.079
3076					k star	60.68				99% KM (Chebyshev) UCL		0.0898
3077					Theta star	0.00101						
3078					Nu star	849.6				**Potential UCLs to Use**		
3079					AppChi2	782.9				95% KM (t) UCL		0.0666
3080					95% Gamma Approximate UCL	0.0663				95% KM (Percentile Bootstrap) UCL		0.0655
3081					95% Adjusted Gamma UCL	0.068						
3082	**Note: DL/2 is not a recommended method.**											
3083												
3084												
3085	**Barium, dissolved (ow-1d)**											
3086												
3087					**General Statistics**							
3088					Number of Valid Data	15				Number of Detected Data		8
3089					Number of Distinct Detected Data	8				Number of Non-Detect Data		7
3090										Percent Non-Detects		46.67%
3091												
3092					**Raw Statistics**					**Log-transformed Statistics**		
3093					Minimum Detected	0.0328				Minimum Detected		-3.417
3094					Maximum Detected	0.113				Maximum Detected		-2.18
3095					Mean of Detected	0.072				Mean of Detected		-2.727
3096					SD of Detected	0.0312				SD of Detected		0.491
3097					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
3098					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
3099												
3100												
3101					**Warning: There are only 8 Detected Values in this data**							
3102					**Note: It should be noted that even though bootstrap may be performed on this data set**							
3103					**the resulting calculations may not be reliable enough tp draw conclusions**							
3104												
3105					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
3106												
3107												
3108					**UCL Statistics**							
3109					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
3110					Shapiro Wilk Test Statistic	0.909				Shapiro Wilk Test Statistic		0.881
3111					5% Shapiro Wilk Critical Value	0.818				5% Shapiro Wilk Critical Value		0.818
3112					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
3113												
3114					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
3115					DL/2 Substitution Method					DL/2 Substitution Method		
3116					Mean	0.108				Mean		-2.34
3117					SD	0.0459				SD		0.552
3118					95% DL/2 (t) UCL	0.129				95% H-Stat (DL/2) UCL		0.453
3119												
3120					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
3121					**MLE method failed to converge properly**					Mean in Log Scale		-2.727
3122										SD in Log Scale		0.46
3123										Mean in Original Scale		0.0718
3124										SD in Original Scale		0.0307
3125										95% Percentile Bootstrap UCL		0.0847
3126										95% BCA Bootstrap UCL		0.0845
3127												

3128	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
3129					k star (bias corrected)	3.41	Data appear Normal at 5% Significance Level					
3130					Theta Star	0.0211						
3131					nu star	54.55						
3132												
3133					A-D Test Statistic	0.443	Nonparametric Statistics					
3134					5% A-D Critical Value	0.719				Kaplan-Meier (KM) Method		
3135					K-S Test Statistic	0.719				Mean		0.072
3136					5% K-S Critical Value	0.295				SD		0.0292
3137	Data appear Gamma Distributed at 5% Significance Level									SE of Mean		0.011
3138										95% KM (t) UCL		0.0914
3139	Assuming Gamma Distribution									95% KM (z) UCL		0.0902
3140					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.0921
3141					Minimum	0.0243				95% KM (bootstrap t) UCL		0.0913
3142					Maximum	0.113				95% KM (BCA) UCL		0.089
3143					Mean	0.0721				95% KM (Percentile Bootstrap) UCL		0.0891
3144					Median	0.0765				95% KM (Chebyshev) UCL		0.12
3145					SD	0.0294				97.5% KM (Chebyshev) UCL		0.141
3146					k star	4.276				99% KM (Chebyshev) UCL		0.182
3147					Theta star	0.0169						
3148					Nu star	128.3	Potential UCLs to Use					
3149					AppChi2	103.1				95% KM (t) UCL		0.0914
3150					95% Gamma Approximate UCL	0.0897				95% KM (Percentile Bootstrap) UCL		0.0891
3151					95% Adjusted Gamma UCL	0.0922						
3152	Note: DL/2 is not a recommended method.											
3153												
3154												
3155	Barium, dissolved (ow-1m)											
3156												
3157	General Statistics											
3158					Number of Valid Data	15				Number of Detected Data		8
3159					Number of Distinct Detected Data	8				Number of Non-Detect Data		7
3160										Percent Non-Detects		46.67%
3161												
3162	Raw Statistics						Log-transformed Statistics					
3163					Minimum Detected	0.0218				Minimum Detected		-3.826
3164					Maximum Detected	0.0962				Maximum Detected		-2.341
3165					Mean of Detected	0.0582				Mean of Detected		-2.91
3166					SD of Detected	0.0205				SD of Detected		0.419
3167					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
3168					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
3169												
3170												
3171	Warning: There are only 8 Detected Values in this data											
3172	Note: It should be noted that even though bootstrap may be performed on this data set											
3173	the resulting calculations may not be reliable enough tp draw conclusions											
3174												
3175	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
3176												
3177												
3178	UCL Statistics											
3179	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
3180					Shapiro Wilk Test Statistic	0.899				Shapiro Wilk Test Statistic		0.824

3181				5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818
3182	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3183												
3184	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3185				DL/2 Substitution Method						DL/2 Substitution Method		
3186				Mean	0.101					Mean	-2.437	
3187				SD	0.0496					SD	0.601	
3188				95% DL/2 (t) UCL	0.124					95% H-Stat (DL/2) UCL	0.488	
3189												
3190				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3191	**MLE method failed to converge properly**									Mean in Log Scale	-2.91	
3192										SD in Log Scale	0.379	
3193										Mean in Original Scale	0.0579	
3194										SD in Original Scale	0.0198	
3195										95% Percentile Bootstrap UCL	0.0664	
3196										95% BCA Bootstrap UCL	0.0664	
3197												
3198	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3199				k star (bias corrected)	4.891		**Data appear Normal at 5% Significance Level**					
3200				Theta Star	0.0119							
3201				nu star	78.25							
3202												
3203				A-D Test Statistic	0.655		**Nonparametric Statistics**					
3204				5% A-D Critical Value	0.717					Kaplan-Meier (KM) Method		
3205				K-S Test Statistic	0.717					Mean	0.0582	
3206				5% K-S Critical Value	0.295					SD	0.0192	
3207	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00724	
3208										95% KM (t) UCL	0.071	
3209	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0701	
3210				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0714	
3211				Minimum	0.0218					95% KM (bootstrap t) UCL	0.0728	
3212				Maximum	0.0962					95% KM (BCA) UCL	0.0706	
3213				Mean	0.0583					95% KM (Percentile Bootstrap) UCL	0.0694	
3214				Median	0.0581					95% KM (Chebyshev) UCL	0.0898	
3215				SD	0.0186					97.5% KM (Chebyshev) UCL	0.103	
3216				k star	7.064					99% KM (Chebyshev) UCL	0.13	
3217				Theta star	0.00825							
3218				Nu star	211.9		**Potential UCLs to Use**					
3219				AppChi2	179.2					95% KM (t) UCL	0.071	
3220				95% Gamma Approximate UCL	0.0689					95% KM (Percentile Bootstrap) UCL	0.0694	
3221				95% Adjusted Gamma UCL	0.0704							
3222	**Note: DL/2 is not a recommended method.**											
3223												
3224												
3225	**Barium, dissolved (ow-1s)**											
3226												
3227	**General Statistics**											
3228				Number of Valid Data	13					Number of Detected Data	6	
3229				Number of Distinct Detected Data	6					Number of Non-Detect Data	7	
3230										Percent Non-Detects	53.85%	
3231												
3232	**Raw Statistics**						**Log-transformed Statistics**					
3233				Minimum Detected	0.0607					Minimum Detected	-2.802	

3234				Maximum Detected	0.0829					Maximum Detected	-2.49	
3235				Mean of Detected	0.0704					Mean of Detected	-2.66	
3236				SD of Detected	0.00839					SD of Detected	0.117	
3237				Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204	
3238				Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204	
3239												
3240												
3241	**Warning: There are only 6 Detected Values in this data**											
3242	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3243	**the resulting calculations may not be reliable enough tp draw conclusions**											
3244												
3245	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3246												
3247												
3248	**UCL Statistics**											
3249	**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**						
3250				Shapiro Wilk Test Statistic	0.893					Shapiro Wilk Test Statistic	0.906	
3251				5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788	
3252	**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**						
3253												
3254	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
3255				DL/2 Substitution Method						DL/2 Substitution Method		
3256				Mean	0.113					Mean	-2.249	
3257				SD	0.0417					SD	0.403	
3258				95% DL/2 (t) UCL	0.134					95% H-Stat (DL/2) UCL	0.39	
3259												
3260				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3261	**MLE method failed to converge properly**									Mean in Log Scale	-2.66	
3262										SD in Log Scale	0.11	
3263										Mean in Original Scale	0.0703	
3264										SD in Original Scale	0.00783	
3265										95% Percentile Bootstrap UCL	0.0737	
3266										95% BCA Bootstrap UCL	0.0739	
3267												
3268	**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**						
3269				k star (bias corrected)	43.63	**Data appear Normal at 5% Significance Level**						
3270				Theta Star	0.00161							
3271				nu star	523.5							
3272												
3273				A-D Test Statistic	0.451	**Nonparametric Statistics**						
3274				5% A-D Critical Value	0.696					Kaplan-Meier (KM) Method		
3275				K-S Test Statistic	0.696					Mean	0.0704	
3276				5% K-S Critical Value	0.332					SD	0.00766	
3277	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00342	
3278										95% KM (t) UCL	0.0765	
3279	**Assuming Gamma Distribution**									95% KM (z) UCL	0.076	
3280				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0768	
3281				Minimum	0.0572					95% KM (bootstrap t) UCL	0.0853	
3282				Maximum	0.0829					95% KM (BCA) UCL	0.0759	
3283				Mean	0.0703					95% KM (Percentile Bootstrap) UCL	0.0759	
3284				Median	0.0684					95% KM (Chebyshev) UCL	0.0853	
3285				SD	0.00766					97.5% KM (Chebyshev) UCL	0.0917	
3286				k star	69.59					99% KM (Chebyshev) UCL	0.104	

3287					Theta star	0.00101						
3288					Nu star	1809	**Potential UCLs to Use**					
3289					AppChi2	1712				95% KM (t) UCL		0.0765
3290				95% Gamma Approximate UCL		0.0743				95% KM (Percentile Bootstrap) UCL		0.0759
3291				95% Adjusted Gamma UCL		0.0749						
3292	**Note: DL/2 is not a recommended method.**											
3293												
3294												
3295	**Barium, dissolved (ow-2d)**											
3296												
3297	**General Statistics**											
3298					Number of Valid Data	14				Number of Detected Data		7
3299					Number of Distinct Detected Data	7				Number of Non-Detect Data		7
3300										Percent Non-Detects		50.00%
3301												
3302	**Raw Statistics**						**Log-transformed Statistics**					
3303					Minimum Detected	0.0197				Minimum Detected		-3.927
3304					Maximum Detected	0.0833				Maximum Detected		-2.485
3305					Mean of Detected	0.0418				Mean of Detected		-3.364
3306					SD of Detected	0.0276				SD of Detected		0.655
3307					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
3308					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
3309												
3310												
3311	**Warning: There are only 7 Detected Values in this data**											
3312	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3313	**the resulting calculations may not be reliable enough tp draw conclusions**											
3314												
3315	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3316												
3317												
3318	**UCL Statistics**											
3319	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3320					Shapiro Wilk Test Statistic	0.79				Shapiro Wilk Test Statistic		0.782
3321					5% Shapiro Wilk Critical Value	0.803				5% Shapiro Wilk Critical Value		0.803
3322	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3323												
3324	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3325					DL/2 Substitution Method					DL/2 Substitution Method		
3326					Mean	0.0959				Mean		-2.63
3327					SD	0.0592				SD		0.882
3328					95% DL/2 (t) UCL	0.124				95% H-Stat (DL/2) UCL		0.872
3329												
3330					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
3331	**MLE method failed to converge properly**									Mean in Log Scale		-3.364
3332										SD in Log Scale		0.601
3333										Mean in Original Scale		0.0409
3334										SD in Original Scale		0.0246
3335										95% Percentile Bootstrap UCL		0.0518
3336										95% BCA Bootstrap UCL		0.0527
3337												
3338	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3339					k star (bias corrected)	1.707	**Data do not follow a Discernable Distribution (0.05)**					

3340					Theta Star	0.0245						
3341					nu star	23.9						
3342												
3343					A-D Test Statistic	0.819	**Nonparametric Statistics**					
3344					5% A-D Critical Value	0.713	Kaplan-Meier (KM) Method					
3345					K-S Test Statistic	0.713	Mean	0.0418				
3346					5% K-S Critical Value	0.314	SD	0.0255				
3347	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0104				
3348							95% KM (t) UCL	0.0602				
3349	**Assuming Gamma Distribution**						95% KM (z) UCL	0.0589				
3350					Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.061				
3351					Minimum	0.00471	95% KM (bootstrap t) UCL	0.0698				
3352					Maximum	0.0833	95% KM (BCA) UCL	0.0587				
3353					Mean	0.0418	95% KM (Percentile Bootstrap) UCL	0.0583				
3354					Median	0.0382	95% KM (Chebyshev) UCL	0.0872				
3355					SD	0.025	97.5% KM (Chebyshev) UCL	0.107				
3356					k star	1.893	99% KM (Chebyshev) UCL	0.145				
3357					Theta star	0.0221						
3358					Nu star	53	**Potential UCLs to Use**					
3359					AppChi2	37.28	95% KM (t) UCL	0.0602				
3360					95% Gamma Approximate UCL	0.0594	95% KM (% Bootstrap) UCL	0.0583				
3361					95% Adjusted Gamma UCL	0.0623						
3362	**Note: DL/2 is not a recommended method.**											
3363												
3364												
3365	**Barium, dissolved (ow-2m)**											
3366												
3367	**General Statistics**											
3368					Number of Valid Data	13	Number of Detected Data	6				
3369					Number of Distinct Detected Data	6	Number of Non-Detect Data	7				
3370							Percent Non-Detects	53.85%				
3371												
3372	**Raw Statistics**						**Log-transformed Statistics**					
3373					Minimum Detected	0.0449	Minimum Detected	-3.103				
3374					Maximum Detected	0.0672	Maximum Detected	-2.7				
3375					Mean of Detected	0.0558	Mean of Detected	-2.897				
3376					SD of Detected	0.00883	SD of Detected	0.16				
3377					Minimum Non-Detect	0.3	Minimum Non-Detect	-1.204				
3378					Maximum Non-Detect	0.3	Maximum Non-Detect	-1.204				
3379												
3380												
3381	**Warning: There are only 6 Detected Values in this data**											
3382	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3383	**the resulting calculations may not be reliable enough tp draw conclusions**											
3384												
3385	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3386												
3387												
3388	**UCL Statistics**											
3389	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3390					Shapiro Wilk Test Statistic	0.941	Shapiro Wilk Test Statistic	0.937				
3391					5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788				
3392	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					

3393												
3394	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3395				DL/2 Substitution Method						DL/2 Substitution Method		
3396				Mean	0.107					Mean	-2.359	
3397				SD	0.0492					SD	0.529	
3398				95% DL/2 (t) UCL	0.131					95% H-Stat (DL/2) UCL	0.465	
3399												
3400				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3401	**MLE method failed to converge properly**									Mean in Log Scale	-2.897	
3402										SD in Log Scale	0.154	
3403										Mean in Original Scale	0.0558	
3404										SD in Original Scale	0.00854	
3405										95% Percentile Bootstrap UCL	0.0596	
3406										95% BCA Bootstrap UCL	0.0596	
3407												
3408	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3409				k star (bias corrected)	23.7		**Data appear Normal at 5% Significance Level**					
3410				Theta Star	0.00235							
3411				nu star	284.4							
3412												
3413				A-D Test Statistic	0.291		**Nonparametric Statistics**					
3414				5% A-D Critical Value	0.697					Kaplan-Meier (KM) Method		
3415				K-S Test Statistic	0.697					Mean	0.0558	
3416				5% K-S Critical Value	0.332					SD	0.00806	
3417	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00361	
3418										95% KM (t) UCL	0.0622	
3419	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0617	
3420				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0625	
3421				Minimum	0.0409					95% KM (bootstrap t) UCL	0.0632	
3422				Maximum	0.0672					95% KM (BCA) UCL	0.0615	
3423				Mean	0.0557					95% KM (Percentile Bootstrap) UCL	0.0612	
3424				Median	0.0573					95% KM (Chebyshev) UCL	0.0715	
3425				SD	0.00842					97.5% KM (Chebyshev) UCL	0.0783	
3426				k star	34.9					99% KM (Chebyshev) UCL	0.0917	
3427				Theta star	0.0016							
3428				Nu star	907.3		**Potential UCLs to Use**					
3429				AppChi2	838.4					95% KM (t) UCL	0.0622	
3430				95% Gamma Approximate UCL	0.0603					95% KM (Percentile Bootstrap) UCL	0.0612	
3431				95% Adjusted Gamma UCL	0.061							
3432	**Note: DL/2 is not a recommended method.**											
3433												
3434												
3435	**Barium, dissolved (ow-2s)**											
3436												
3437	**General Statistics**											
3438				Number of Valid Data	13					Number of Detected Data	6	
3439				Number of Distinct Detected Data	6					Number of Non-Detect Data	7	
3440										Percent Non-Detects	53.85%	
3441												
3442	**Raw Statistics**						**Log-transformed Statistics**					
3443				Minimum Detected	0.0319					Minimum Detected	-3.445	
3444				Maximum Detected	0.0625					Maximum Detected	-2.773	
3445				Mean of Detected	0.0507					Mean of Detected	-3.006	

3446					SD of Detected	0.0112					SD of Detected	0.247
3447					Minimum Non-Detect	0.3					Minimum Non-Detect	-1.204
3448					Maximum Non-Detect	0.3					Maximum Non-Detect	-1.204
3449												
3450												
3451					**Warning: There are only 6 Detected Values in this data**							
3452					**Note: It should be noted that even though bootstrap may be performed on this data set**							
3453					**the resulting calculations may not be reliable enough tp draw conclusions**							
3454												
3455					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
3456												
3457												
3458					**UCL Statistics**							
3459					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
3460					Shapiro Wilk Test Statistic	0.937					Shapiro Wilk Test Statistic	0.894
3461					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
3462					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
3463												
3464					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3465					DL/2 Substitution Method						DL/2 Substitution Method	
3466					Mean	0.104					Mean	-2.409
3467					SD	0.052					SD	0.597
3468					95% DL/2 (t) UCL	0.13					95% H-Stat (DL/2) UCL	0.391
3469												
3470					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3471					**MLE method failed to converge properly**						Mean in Log Scale	-3.006
3472											SD in Log Scale	0.232
3473											Mean in Original Scale	0.0507
3474											SD in Original Scale	0.0112
3475											95% Percentile Bootstrap UCL	0.0553
3476											95% BCA Bootstrap UCL	0.0554
3477												
3478					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
3479					k star (bias corrected)	10.82					**Data appear Normal at 5% Significance Level**	
3480					Theta Star	0.00469						
3481					nu star	129.8						
3482												
3483					A-D Test Statistic	0.328					**Nonparametric Statistics**	
3484					5% A-D Critical Value	0.697					Kaplan-Meier (KM) Method	
3485					K-S Test Statistic	0.697					Mean	0.0507
3486					5% K-S Critical Value	0.332					SD	0.0103
3487					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00459
3488											95% KM (t) UCL	0.0589
3489					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0582
3490					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0593
3491					Minimum	0.0315					95% KM (bootstrap t) UCL	0.0585
3492					Maximum	0.0638					95% KM (BCA) UCL	0.0576
3493					Mean	0.0506					95% KM (Percentile Bootstrap) UCL	0.0577
3494					Median	0.0526					95% KM (Chebyshev) UCL	0.0707
3495					SD	0.0109					97.5% KM (Chebyshev) UCL	0.0793
3496					k star	16.1					99% KM (Chebyshev) UCL	0.0963
3497					Theta star	0.00314						
3498					Nu star	418.5					**Potential UCLs to Use**	

3499					AppChi2	372.1				95% KM (t) UCL		0.0589
3500					95% Gamma Approximate UCL	0.0569				95% KM (Percentile Bootstrap) UCL		0.0577
3501					95% Adjusted Gamma UCL	0.0579						
3502	**Note: DL/2 is not a recommended method.**											
3503												
3504												
3505	**Barium, dissolved (ow-3d)**											
3506												
3507	**General Statistics**											
3508					Number of Valid Observations	2				Number of Distinct Observations		2
3509												
3510												
3511	**Warning: This data set only has 2 observations!**											
3512	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3513	**The data set for variable Barium, dissolved (ow-3d) was not processed!**											
3514												
3515	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3516	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3517												
3518												
3519												
3520	**Barium, dissolved (ow-3m)**											
3521												
3522	**General Statistics**											
3523					Number of Valid Observations	4				Number of Distinct Observations		4
3524												
3525												
3526	**Warning: This data set only has 4 observations!**											
3527	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3528	**The data set for variable Barium, dissolved (ow-3m) was not processed!**											
3529												
3530	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3531	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3532												
3533												
3534												
3535	**Barium, dissolved (ow-3s)**											
3536												
3537	**General Statistics**											
3538					Number of Valid Observations	3				Number of Distinct Observations		3
3539												
3540												
3541	**Warning: This data set only has 3 observations!**											
3542	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3543	**The data set for variable Barium, dissolved (ow-3s) was not processed!**											
3544												
3545	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3546	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3547												
3548												
3549												
3550	**Barium, dissolved (ow-5d)**											
3551												

	A	B	C	D	E	F	G	H	I	J	K	L
3552	**General Statistics**											
3553					Number of Valid Data	14				Number of Detected Data		7
3554					Number of Distinct Detected Data	7				Number of Non-Detect Data		7
3555										Percent Non-Detects		50.00%
3556												
3557	**Raw Statistics**						**Log-transformed Statistics**					
3558					Minimum Detected	0.0188				Minimum Detected		-3.974
3559					Maximum Detected	0.0844				Maximum Detected		-2.472
3560					Mean of Detected	0.0507				Mean of Detected		-3.095
3561					SD of Detected	0.0231				SD of Detected		0.547
3562					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
3563					Maximum Non-Detect	0.3				Maximum Non-Detect		-1.204
3564												
3565												
3566	**Warning: There are only 7 Detected Values in this data**											
3567	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3568	**the resulting calculations may not be reliable enough tp draw conclusions**											
3569												
3570	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3571												
3572												
3573	**UCL Statistics**											
3574	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3575					Shapiro Wilk Test Statistic	0.961				Shapiro Wilk Test Statistic		0.906
3576					5% Shapiro Wilk Critical Value	0.803				5% Shapiro Wilk Critical Value		0.803
3577	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3578												
3579	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3580					DL/2 Substitution Method					DL/2 Substitution Method		
3581					Mean	0.1				Mean		-2.496
3582					SD	0.0539				SD		0.724
3583					95% DL/2 (t) UCL	0.126				95% H-Stat (DL/2) UCL		0.601
3584												
3585					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
3586	**MLE method failed to converge properly**									Mean in Log Scale		-3.095
3587										SD in Log Scale		0.514
3588										Mean in Original Scale		0.0507
3589										SD in Original Scale		0.0238
3590										95% Percentile Bootstrap UCL		0.0613
3591										95% BCA Bootstrap UCL		0.0615
3592												
3593	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3594					k star (bias corrected)	2.717	**Data appear Normal at 5% Significance Level**					
3595					Theta Star	0.0187						
3596					nu star	38.03						
3597												
3598					A-D Test Statistic	0.343	**Nonparametric Statistics**					
3599					5% A-D Critical Value	0.71				Kaplan-Meier (KM) Method		
3600					K-S Test Statistic	0.71				Mean		0.0507
3601					5% K-S Critical Value	0.313				SD		0.0214
3602	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.00875
3603										95% KM (t) UCL		0.0662
3604	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0651

3605	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL		0.0668
3606					Minimum	0.0146				95% KM (bootstrap t) UCL		0.0676
3607					Maximum	0.0844				95% KM (BCA) UCL		0.065
3608					Mean	0.0507				95% KM (Percentile Bootstrap) UCL		0.0642
3609					Median	0.0537				95% KM (Chebyshev) UCL		0.0888
3610					SD	0.022				97.5% KM (Chebyshev) UCL		0.105
3611					k star	3.53				99% KM (Chebyshev) UCL		0.138
3612					Theta star	0.0144						
3613					Nu star	98.83				**Potential UCLs to Use**		
3614					AppChi2	76.9				95% KM (t) UCL		0.0662
3615				95% Gamma Approximate UCL		0.0651				95% KM (Percentile Bootstrap) UCL		0.0642
3616				95% Adjusted Gamma UCL		0.0674						
3617	**Note: DL/2 is not a recommended method.**											
3618												
3619												
3620	**Barium, dissolved (ow-5m)**											
3621												
3622	**General Statistics**											
3623				Number of Valid Data		14				Number of Detected Data		7
3624				Number of Distinct Detected Data		7				Number of Non-Detect Data		7
3625										Percent Non-Detects		50.00%
3626												
3627	**Raw Statistics**									**Log-transformed Statistics**		
3628				Minimum Detected		0.0381				Minimum Detected		-3.268
3629				Maximum Detected		0.0601				Maximum Detected		-2.812
3630				Mean of Detected		0.0465				Mean of Detected		-3.078
3631				SD of Detected		0.00739				SD of Detected		0.153
3632				Minimum Non-Detect		0.3				Minimum Non-Detect		-1.204
3633				Maximum Non-Detect		0.3				Maximum Non-Detect		-1.204
3634												
3635												
3636	**Warning: There are only 7 Detected Values in this data**											
3637	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3638	**the resulting calculations may not be reliable enough tp draw conclusions**											
3639												
3640	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3641												
3642												
3643	**UCL Statistics**											
3644	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
3645				Shapiro Wilk Test Statistic		0.937				Shapiro Wilk Test Statistic		0.964
3646				5% Shapiro Wilk Critical Value		0.803				5% Shapiro Wilk Critical Value		0.803
3647	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
3648												
3649	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
3650				DL/2 Substitution Method						DL/2 Substitution Method		
3651					Mean	0.0983					Mean	-2.487
3652					SD	0.0539					SD	0.621
3653				95% DL/2 (t) UCL		0.124				95% H-Stat (DL/2) UCL		0.557
3654												
3655				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
3656	**MLE method failed to converge properly**									Mean in Log Scale		-3.078
3657										SD in Log Scale		0.145

3658											Mean in Original Scale	0.0465
3659											SD in Original Scale	0.0069
3660											95% Percentile Bootstrap UCL	0.0496
3661											95% BCA Bootstrap UCL	0.0499
3662												
3663				Gamma Distribution Test with Detected Values Only							Data Distribution Test with Detected Values Only	
3664						k star (bias corrected)	28.04				Data appear Normal at 5% Significance Level	
3665						Theta Star	0.00166					
3666						nu star	392.6					
3667												
3668						A-D Test Statistic	0.23				Nonparametric Statistics	
3669						5% A-D Critical Value	0.708				Kaplan-Meier (KM) Method	
3670						K-S Test Statistic	0.708				Mean	0.0465
3671						5% K-S Critical Value	0.311				SD	0.00684
3672				Data appear Gamma Distributed at 5% Significance Level							SE of Mean	0.00279
3673											95% KM (t) UCL	0.0515
3674				Assuming Gamma Distribution							95% KM (z) UCL	0.0511
3675						Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.0517
3676						Minimum	0.0353				95% KM (bootstrap t) UCL	0.054
3677						Maximum	0.0601				95% KM (BCA) UCL	0.0514
3678						Mean	0.0465				95% KM (Percentile Bootstrap) UCL	0.0512
3679						Median	0.0467				95% KM (Chebyshev) UCL	0.0587
3680						SD	0.00674				97.5% KM (Chebyshev) UCL	0.064
3681						k star	40.34				99% KM (Chebyshev) UCL	0.0743
3682						Theta star	0.00115					
3683						Nu star	1130				Potential UCLs to Use	
3684						AppChi2	1053				95% KM (t) UCL	0.0515
3685						95% Gamma Approximate UCL	0.0499				95% KM (Percentile Bootstrap) UCL	0.0512
3686						95% Adjusted Gamma UCL	0.0504					
3687	Note: DL/2 is not a recommended method.											
3688												
3689												
3690	Barium, dissolved (ow-5s)											
3691												
3692							General Statistics					
3693						Number of Valid Data	14				Number of Detected Data	7
3694						Number of Distinct Detected Data	7				Number of Non-Detect Data	7
3695											Percent Non-Detects	50.00%
3696												
3697				Raw Statistics							Log-transformed Statistics	
3698						Minimum Detected	0.0483				Minimum Detected	-3.03
3699						Maximum Detected	0.0644				Maximum Detected	-2.743
3700						Mean of Detected	0.0544				Mean of Detected	-2.917
3701						SD of Detected	0.00581				SD of Detected	0.104
3702						Minimum Non-Detect	0.3				Minimum Non-Detect	-1.204
3703						Maximum Non-Detect	0.3				Maximum Non-Detect	-1.204
3704												
3705												
3706	Warning: There are only 7 Detected Values in this data											
3707	Note: It should be noted that even though bootstrap may be performed on this data set											
3708	the resulting calculations may not be reliable enough tp draw conclusions											
3709												
3710	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											

3711												
3712												
3713	**UCL Statistics**											
3714	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3715					Shapiro Wilk Test Statistic	0.92					Shapiro Wilk Test Statistic	0.932
3716					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
3717	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3718												
3719	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3720					DL/2 Substitution Method						DL/2 Substitution Method	
3721					Mean	0.102					Mean	-2.407
3722					SD	0.0498					SD	0.534
3723					95% DL/2 (t) UCL	0.126					95% H-Stat (DL/2) UCL	0.392
3724												
3725					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3726	**MLE method failed to converge properly**										Mean in Log Scale	-2.917
3727											SD in Log Scale	0.0986
3728											Mean in Original Scale	0.0544
3729											SD in Original Scale	0.00543
3730											95% Percentile Bootstrap UCL	0.0567
3731											95% BCA Bootstrap UCL	0.0568
3732												
3733	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3734					k star (bias corrected)	60.69	**Data appear Normal at 5% Significance Level**					
3735					Theta Star	0.0008958						
3736					nu star	849.7						
3737												
3738					A-D Test Statistic	0.303	**Nonparametric Statistics**					
3739					5% A-D Critical Value	0.708					Kaplan-Meier (KM) Method	
3740					K-S Test Statistic	0.708					Mean	0.0544
3741					5% K-S Critical Value	0.311					SD	0.00537
3742	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00219
3743											95% KM (t) UCL	0.0583
3744	**Assuming Gamma Distribution**										95% KM (z) UCL	0.058
3745					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0584
3746					Minimum	0.0455					95% KM (bootstrap t) UCL	0.0611
3747					Maximum	0.0644					95% KM (BCA) UCL	0.058
3748					Mean	0.0544					95% KM (Percentile Bootstrap) UCL	0.0577
3749					Median	0.0542					95% KM (Chebyshev) UCL	0.0639
3750					SD	0.00529					97.5% KM (Chebyshev) UCL	0.0681
3751					k star	89.51					99% KM (Chebyshev) UCL	0.0762
3752					Theta star	0.0006074						
3753					Nu star	2506	**Potential UCLs to Use**					
3754					AppChi2	2391					95% KM (t) UCL	0.0583
3755					95% Gamma Approximate UCL	0.057					95% KM (Percentile Bootstrap) UCL	0.0577
3756					95% Adjusted Gamma UCL	0.0574						
3757	**Note: DL/2 is not a recommended method.**											
3758												
3759												
3760	**Barium, dissolved (park moabi-4)**											
3761												
3762	**General Statistics**											
3763					Number of Valid Observations	1					Number of Distinct Observations	1

	A	B	C	D	E	F	G	H	I	J	K	L
3764												
3765												
3766	Warning: This data set only has 1 observations!											
3767	Data set is too small to compute reliable and meaningful statistics and estimates!											
3768	The data set for variable Barium, dissolved (park moabi-4) was not processed!											
3769												
3770	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3771	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3772												
3773												
3774												
3775	Barium, dissolved (pe-1)											
3776												
3777	General Statistics											
3778	Number of Valid Data	2		Number of Detected Data	0							
3779	Number of Distinct Detected Data	0		Number of Non-Detect Data	2							
3780				Percent Non-Detects	100.00%							
3781												
3782	Warning: This data set only has 2 observations!											
3783	Data set is too small to compute reliable and meaningful statistics and estimates!											
3784	The data set for variable Barium, dissolved (pe-1) was not processed!											
3785												
3786	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3787	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3788												
3789												
3790												
3791	Barium, dissolved (pge-6)											
3792												
3793	General Statistics											
3794	Number of Valid Observations	3		Number of Distinct Observations	3							
3795												
3796												
3797	Warning: This data set only has 3 observations!											
3798	Data set is too small to compute reliable and meaningful statistics and estimates!											
3799	The data set for variable Barium, dissolved (pge-6) was not processed!											
3800												
3801	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3802	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3803												
3804												
3805												
3806	Barium, dissolved (pge-7)											
3807												
3808	General Statistics											
3809	Number of Valid Observations	2		Number of Distinct Observations	2							
3810												
3811												
3812	Warning: This data set only has 2 observations!											
3813	Data set is too small to compute reliable and meaningful statistics and estimates!											
3814	The data set for variable Barium, dissolved (pge-7) was not processed!											
3815												
3816	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											

	A	B	C	D	E	F	G	H	I	J	K	L
3817	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3818												
3819												
3820												
3821	Barium, dissolved (pge-8)											
3822												
3823	General Statistics											
3824					Number of Valid Observations	3			Number of Distinct Observations	3		
3825												
3826												
3827	Warning: This data set only has 3 observations!											
3828	Data set is too small to compute reliable and meaningful statistics and estimates!											
3829	The data set for variable Barium, dissolved (pge-8) was not processed!											
3830												
3831	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3832	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3833												
3834												
3835												
3836	Barium, dissolved (tw-1)											
3837												
3838	General Statistics											
3839					Number of Valid Data	4			Number of Detected Data	1		
3840					Number of Distinct Detected Data	1			Number of Non-Detect Data	3		
3841									Percent Non-Detects	75.00%		
3842												
3843	Warning: This data set only has 4 observations!											
3844	Data set is too small to compute reliable and meaningful statistics and estimates!											
3845	The data set for variable Barium, dissolved (tw-1) was not processed!											
3846												
3847	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3848	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3849												
3850												
3851												
3852	Barium, dissolved (tw-2d)											
3853												
3854	General Statistics											
3855					Number of Valid Observations	3			Number of Distinct Observations	3		
3856												
3857												
3858	Warning: This data set only has 3 observations!											
3859	Data set is too small to compute reliable and meaningful statistics and estimates!											
3860	The data set for variable Barium, dissolved (tw-2d) was not processed!											
3861												
3862	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3863	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3864												
3865												
3866												
3867	Barium, dissolved (tw-2s)											
3868												
3869	General Statistics											

	A	B	C	D	E	F	G	H	I	J	K	L
3870					Number of Valid Data	3				Number of Detected Data		2
3871					Number of Distinct Detected Data	2				Number of Non-Detect Data		1
3872										Percent Non-Detects		33.33%
3873												
3874						**Warning: This data set only has 3 observations!**						
3875						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
3876						**The data set for variable Barium, dissolved (tw-2s) was not processed!**						
3877												
3878						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
3879						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
3880												
3881												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Chromium, dissolved (1)

General Statistics

Number of Valid Data	148	Number of Detected Data	105
Number of Distinct Detected Data	88	Number of Non-Detect Data	43
		Percent Non-Detects	29.05%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.00104	Minimum Detected	-6.869
Maximum Detected	0.0404	Maximum Detected	-3.209
Mean of Detected	0.0121	Mean of Detected	-4.742
SD of Detected	0.00906	SD of Detected	0.887
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.168	Lilliefors Test Statistic	0.168
5% Lilliefors Critical Value	0.0865	5% Lilliefors Critical Value	0.0865
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00872	Mean	-5.573
SD	0.00927	SD	1.501
95% DL/2 (t) UCL	0.00998	95% H-Stat (DL/2) UCL	0.00941
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00662	Mean in Log Scale	-5.315
SD	0.0119	SD in Log Scale	1.207
95% MLE (t) UCL	0.00824	Mean in Original Scale	0.00898
95% MLE (Tiku) UCL	0.00833	SD in Original Scale	0.00905
		95% Percentile Bootstrap UCL	0.0102
		95% BCA Bootstrap UCL	0.0104

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.639	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.00737		
nu star	344.2		
A-D Test Statistic	1.109	**Nonparametric Statistics**	
5% A-D Critical Value	0.768	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.768	Mean	0.00887
5% K-S Critical Value	0.0896	SD	0.0091

54	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.0007515
55											95% KM (t) UCL	0.0101
56	Assuming Gamma Distribution										95% KM (z) UCL	0.0101
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0101
58	Minimum	1E-09									95% KM (bootstrap t) UCL	0.0102
59	Maximum	0.0404									95% KM (BCA) UCL	0.0101
60	Mean	0.00985									95% KM (Percentile Bootstrap) UCL	0.0101
61	Median	0.0087									95% KM (Chebyshev) UCL	0.0122
62	SD	0.0086									97.5% KM (Chebyshev) UCL	0.0136
63	k star	0.469									99% KM (Chebyshev) UCL	0.0164
64	Theta star	0.021										
65	Nu star	138.9									Potential UCLs to Use	
66	AppChi2	112.7									95% KM (BCA) UCL	0.0101
67	95% Gamma Approximate UCL	0.0121										
68	95% Adjusted Gamma UCL	0.0122										
69	Note: DL/2 is not a recommended method.											
70												
71												
72	Chromium, dissolved (cw-1d)											
73												
74	General Statistics											
75	Number of Valid Data	8									Number of Detected Data	4
76	Number of Distinct Detected Data	4									Number of Non-Detect Data	4
77											Percent Non-Detects	50.00%
78												
79	Raw Statistics										Log-transformed Statistics	
80	Minimum Detected	0.00105									Minimum Detected	-6.859
81	Maximum Detected	0.0022									Maximum Detected	-6.119
82	Mean of Detected	0.00154									Mean of Detected	-6.515
83	SD of Detected	0.0004956									SD of Detected	0.315
84	Minimum Non-Detect	0.001									Minimum Non-Detect	-6.908
85	Maximum Non-Detect	0.001									Maximum Non-Detect	-6.908
86												
87												
88	Warning: There are only 4 Distinct Detected Values in this data											
89	Note: It should be noted that even though bootstrap may be performed on this data set											
90	the resulting calculations may not be reliable enough tp draw conclusions											
91												
92	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
93												
94												
95	UCL Statistics											
96	Normal Distribution Test with Detected Values Only										Lognormal Distribution Test with Detected Values Only	
97	Shapiro Wilk Test Statistic	0.959									Shapiro Wilk Test Statistic	0.99
98	5% Shapiro Wilk Critical Value	0.748									5% Shapiro Wilk Critical Value	0.748
99	Data appear Normal at 5% Significance Level										Data appear Lognormal at 5% Significance Level	
100												
101	Assuming Normal Distribution										Assuming Lognormal Distribution	
102	DL/2 Substitution Method										DL/2 Substitution Method	
103	Mean	0.00102									Mean	-7.058
104	SD	0.0006425									SD	0.616
105	95% DL/2 (t) UCL	0.00145									95% H-Stat (DL/2) UCL	0.00133
106												

107	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
108	Mean				0.0009915		Mean in Log Scale					-7.032
109	SD				0.0006912		SD in Log Scale					0.625
110	95% MLE (t) UCL				0.00145		Mean in Original Scale					0.00104
111	95% MLE (Tiku) UCL				0.00156		SD in Original Scale					0.0006307
112							95% Percentile Bootstrap UCL					0.0014
113							95% BCA Bootstrap UCL					0.00145
114												
115	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
116	k star (bias corrected)				3.519		**Data appear Normal at 5% Significance Level**					
117	Theta Star				0.000437							
118	nu star				28.15							
119												
120	A-D Test Statistic				0.22		**Nonparametric Statistics**					
121	5% A-D Critical Value				0.657		Kaplan-Meier (KM) Method					
122	K-S Test Statistic				0.657		Mean					0.00129
123	5% K-S Critical Value				0.395		SD					0.0003893
124	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0001589
125							95% KM (t) UCL					0.00159
126	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00156
127	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00157
128	Minimum				0.0009457		95% KM (bootstrap t) UCL					0.0016
129	Maximum				0.0022		95% KM (BCA) UCL					0.0022
130	Mean				0.00154		95% KM (Percentile Bootstrap) UCL					0.00169
131	Median				0.00151		95% KM (Chebyshev) UCL					0.00199
132	SD				0.0004472		97.5% KM (Chebyshev) UCL					0.00229
133	k star				8.293		99% KM (Chebyshev) UCL					0.00287
134	Theta star				0.0001854							
135	Nu star				132.7		**Potential UCLs to Use**					
136	AppChi2				107.1		95% KM (t) UCL					0.00159
137	95% Gamma Approximate UCL				0.00191		95% KM (Percentile Bootstrap) UCL					0.00169
138	95% Adjusted Gamma UCL				N/A							
139	**Note: DL/2 is not a recommended method.**											
140												
141												
142	**Chromium, dissolved (cw-1m)**											
143												
144	**General Statistics**											
145	Number of Valid Observations				8		Number of Distinct Observations					8
146												
147	**Raw Statistics**						**Log-transformed Statistics**					
148	Minimum				0.00481		Minimum of Log Data					-5.337
149	Maximum				0.0178		Maximum of Log Data					-4.029
150	Mean				0.0132		Mean of log Data					-4.403
151	Median				0.0143		SD of log Data					0.461
152	SD				0.00476							
153	Coefficient of Variation				0.36							
154	Skewness				-0.873							
155												
156												
157	**Warning: There are only 8 Values in this data**											
158	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
159	**the resulting calculations may not be reliable enough to draw conclusions**											

160												
161	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
162												
163	**Relevant UCL Statistics**											
164	**Normal Distribution Test**						**Lognormal Distribution Test**					
165				Shapiro Wilk Test Statistic	0.885					Shapiro Wilk Test Statistic	0.823	
166				Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818	
167	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
168												
169	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
170				95% Student's-t UCL	0.0164					95% H-UCL	0.0203	
171	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.023	
172				95% Adjusted-CLT UCL	0.0155					97.5% Chebyshev (MVUE) UCL	0.0272	
173				95% Modified-t UCL	0.0163					99% Chebyshev (MVUE) UCL	0.0354	
174												
175	**Gamma Distribution Test**						**Data Distribution**					
176				k star (bias corrected)	4.177		**Data appear Normal at 5% Significance Level**					
177				Theta Star	0.00317							
178				nu star	66.83							
179				Approximate Chi Square Value (.05)	49.02		**Nonparametric Statistics**					
180				Adjusted Level of Significance	0.0195					95% CLT UCL	0.016	
181				Adjusted Chi Square Value	45.18					95% Jackknife UCL	0.0164	
182										95% Standard Bootstrap UCL	0.0158	
183				Anderson-Darling Test Statistic	0.579					95% Bootstrap-t UCL	0.0158	
184				Anderson-Darling 5% Critical Value	0.718					95% Hall's Bootstrap UCL	0.0154	
185				Kolmogorov-Smirnov Test Statistic	0.224					95% Percentile Bootstrap UCL	0.0157	
186				Kolmogorov-Smirnov 5% Critical Value	0.295					95% BCA Bootstrap UCL	0.0155	
187	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.0206	
188										97.5% Chebyshev(Mean, Sd) UCL	0.0238	
189	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.03	
190				95% Approximate Gamma UCL	0.018							
191				95% Adjusted Gamma UCL	0.0196							
192												
193	**Potential UCL to Use**									Use 95% Student's-t UCL	0.0164	
194												
195												
196	**Chromium, dissolved (cw-2d)**											
197												
198	**General Statistics**											
199				Number of Valid Data	8					Number of Detected Data	6	
200				Number of Distinct Detected Data	6					Number of Non-Detect Data	2	
201										Percent Non-Detects	25.00%	
202												
203	**Raw Statistics**						**Log-transformed Statistics**					
204				Minimum Detected	0.00155					Minimum Detected	-6.47	
205				Maximum Detected	0.00431					Maximum Detected	-5.447	
206				Mean of Detected	0.00264					Mean of Detected	-6	
207				SD of Detected	0.00103					SD of Detected	0.394	
208				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
209				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
210												
211												
212	**Warning: There are only 6 Detected Values in this data**											

213	**Note: It should be noted that even though bootstrap may be performed on this data set**											
214	**the resulting calculations may not be reliable enough tp draw conclusions**											
215												
216	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
217												
218												
219	**UCL Statistics**											
220	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
221	Shapiro Wilk Test Statistic				0.921		Shapiro Wilk Test Statistic					0.922
222	5% Shapiro Wilk Critical Value				0.788		5% Shapiro Wilk Critical Value					0.788
223	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
224												
225	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
226	DL/2 Substitution Method						DL/2 Substitution Method					
227	Mean				0.00211		Mean					-6.4
228	SD				0.00132		SD					0.813
229	95% DL/2 (t) UCL				0.00299		95% H-Stat (DL/2) UCL					0.0036
230												
231	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
232	Mean				0.00203		Mean in Log Scale					-6.249
233	SD				0.00137		SD in Log Scale					0.575
234	95% MLE (t) UCL				0.00295		Mean in Original Scale					0.00221
235	95% MLE (Tiku) UCL				0.003		SD in Original Scale					0.00118
236							95% Percentile Bootstrap UCL					0.00286
237							95% BCA Bootstrap UCL					0.0029
238												
239	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
240	k star (bias corrected)				4.11		**Data appear Normal at 5% Significance Level**					
241	Theta Star				0.0006431							
242	nu star				49.32							
243												
244	A-D Test Statistic				0.323		**Nonparametric Statistics**					
245	5% A-D Critical Value				0.698		Kaplan-Meier (KM) Method					
246	K-S Test Statistic				0.698		Mean					0.00237
247	5% K-S Critical Value				0.333		SD					0.00094
248	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0003641
249							95% KM (t) UCL					0.00306
250	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00297
251	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00304
252	Minimum				0.00122		95% KM (bootstrap t) UCL					0.00317
253	Maximum				0.00431		95% KM (BCA) UCL					0.00312
254	Mean				0.00236		95% KM (Percentile Bootstrap) UCL					0.00305
255	Median				0.00221		95% KM (Chebyshev) UCL					0.00396
256	SD				0.00102		97.5% KM (Chebyshev) UCL					0.00464
257	k star				4.153		99% KM (Chebyshev) UCL					0.00599
258	Theta star				0.0005689							
259	Nu star				66.45		**Potential UCLs to Use**					
260	AppChi2				48.69		95% KM (t) UCL					0.00306
261	95% Gamma Approximate UCL				0.00322		95% KM (Percentile Bootstrap) UCL					0.00305
262	95% Adjusted Gamma UCL				0.0035							
263	**Note: DL/2 is not a recommended method.**											
264												
265												

Chromium, dissolved (cw-2m)

General Statistics

Number of Valid Observations	8	Number of Distinct Observations	8

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0134	Minimum of Log Data	-4.313
Maximum	0.0186	Maximum of Log Data	-3.985
Mean	0.0156	Mean of log Data	-4.165
Median	0.0156	SD of log Data	0.0958
SD	0.00152		
Coefficient of Variation	0.0976		
Skewness	0.802		

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0166	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0179
95% Adjusted-CLT UCL	0.0166	97.5% Chebyshev (MVUE) UCL	0.0189
95% Modified-t UCL	0.0166	99% Chebyshev (MVUE) UCL	0.0208
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	77.17	**Data appear Normal at 5% Significance Level**	
Theta Star	0.000202		
nu star	1235		
Approximate Chi Square Value (.05)	1154	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0165
Adjusted Chi Square Value	1134	95% Jackknife UCL	0.0166
		95% Standard Bootstrap UCL	0.0164
Anderson-Darling Test Statistic	0.322	95% Bootstrap-t UCL	0.0168
Anderson-Darling 5% Critical Value	0.715	95% Hall's Bootstrap UCL	0.0174
Kolmogorov-Smirnov Test Statistic	0.223	95% Percentile Bootstrap UCL	0.0164
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	0.0166
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0179
		97.5% Chebyshev(Mean, Sd) UCL	0.0189
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0209
95% Approximate Gamma UCL	0.0167		
95% Adjusted Gamma UCL	0.017		
Potential UCL to Use		Use 95% Student's-t UCL	0.0166

	A	B	C	D	E	F	G	H	I	J	K	L
319												
320	**Chromium, dissolved (cw-3d)**											
321												
322						**General Statistics**							
323						Number of Valid Data	8				Number of Detected Data	5
324						Number of Distinct Detected Data	5				Number of Non-Detect Data	3
325											Percent Non-Detects	37.50%
326												
327						**Raw Statistics**					**Log-transformed Statistics**	
328						Minimum Detected	0.002				Minimum Detected	-6.215
329						Maximum Detected	0.00495				Maximum Detected	-5.308
330						Mean of Detected	0.0031				Mean of Detected	-5.828
331						SD of Detected	0.00115				SD of Detected	0.346
332						Minimum Non-Detect	0.001				Minimum Non-Detect	-6.908
333						Maximum Non-Detect	0.001				Maximum Non-Detect	-6.908
334												
335												
336						**Warning: There are only 5 Detected Values in this data**							
337						**Note: It should be noted that even though bootstrap may be performed on this data set**						
338						**the resulting calculations may not be reliable enough tp draw conclusions**						
339												
340						**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**						
341												
342												
343						**UCL Statistics**							
344						**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**	
345						Shapiro Wilk Test Statistic	0.894				Shapiro Wilk Test Statistic	0.954
346						5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value	0.762
347						**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**	
348												
349						**Assuming Normal Distribution**					**Assuming Lognormal Distribution**	
350						DL/2 Substitution Method					DL/2 Substitution Method	
351						Mean	0.00212				Mean	-6.493
352						SD	0.0016				SD	0.954
353						95% DL/2 (t) UCL	0.00319				95% H-Stat (DL/2) UCL	0.00472
354												
355						Maximum Likelihood Estimate(MLE) Method					Log ROS Method	
356						Mean	0.00183				Mean in Log Scale	-6.196
357						SD	0.00193				SD in Log Scale	0.586
358						95% MLE (t) UCL	0.00312				Mean in Original Scale	0.00236
359						95% MLE (Tiku) UCL	0.00328				SD in Original Scale	0.00135
360											95% Percentile Bootstrap UCL	0.00313
361											95% BCA Bootstrap UCL	0.00325
362												
363						**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**	
364						k star (bias corrected)	4.183				**Data appear Normal at 5% Significance Level**	
365						Theta Star	0.0007401					
366						nu star	41.83					
367												
368						A-D Test Statistic	0.302				**Nonparametric Statistics**	
369						5% A-D Critical Value	0.679				Kaplan-Meier (KM) Method	
370						K-S Test Statistic	0.679				Mean	0.00269
371						5% K-S Critical Value	0.358				SD	0.0009718

372	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.0003842
373											95% KM (t) UCL	0.00341
374	Assuming Gamma Distribution										95% KM (z) UCL	0.00332
375	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00336
376	Minimum	0.00173									95% KM (bootstrap t) UCL	0.00426
377	Maximum	0.00495									95% KM (BCA) UCL	0.00359
378	Mean	0.00284									95% KM (Percentile Bootstrap) UCL	0.00353
379	Median	0.00257									95% KM (Chebyshev) UCL	0.00436
380	SD	0.001									97.5% KM (Chebyshev) UCL	0.00508
381	k star	6.661									99% KM (Chebyshev) UCL	0.00651
382	Theta star	0.0004267										
383	Nu star	106.6									Potential UCLs to Use	
384	AppChi2	83.75									95% KM (t) UCL	0.00341
385	95% Gamma Approximate UCL	0.00362									95% KM (Percentile Bootstrap) UCL	0.00353
386	95% Adjusted Gamma UCL	0.00385										
387	Note: DL/2 is not a recommended method.											
388												
389												
390	Chromium, dissolved (cw-3m)											
391												
392	General Statistics											
393	Number of Valid Observations	8									Number of Distinct Observations	8
394												
395	Raw Statistics										Log-transformed Statistics	
396	Minimum	0.0064									Minimum of Log Data	-5.051
397	Maximum	0.0119									Maximum of Log Data	-4.431
398	Mean	0.00933									Mean of log Data	-4.693
399	Median	0.00955									SD of log Data	0.208
400	SD	0.00186										
401	Coefficient of Variation	0.2										
402	Skewness	-0.142										
403												
404												
405	Warning: There are only 8 Values in this data											
406	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
407	the resulting calculations may not be reliable enough to draw conclusions											
408												
409	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
410												
411	Relevant UCL Statistics											
412	Normal Distribution Test										Lognormal Distribution Test	
413	Shapiro Wilk Test Statistic	0.97									Shapiro Wilk Test Statistic	0.959
414	Shapiro Wilk Critical Value	0.818									Shapiro Wilk Critical Value	0.818
415	Data appear Normal at 5% Significance Level										Data appear Lognormal at 5% Significance Level	
416												
417	Assuming Normal Distribution										Assuming Lognormal Distribution	
418	95% Student's-t UCL	0.0106									95% H-UCL	0.0109
419	95% UCLs (Adjusted for Skewness)										95% Chebyshev (MVUE) UCL	0.0123
420	95% Adjusted-CLT UCL	0.0104									97.5% Chebyshev (MVUE) UCL	0.0136
421	95% Modified-t UCL	0.0106									99% Chebyshev (MVUE) UCL	0.0162
422												
423	Gamma Distribution Test										Data Distribution	
424	k star (bias corrected)	17.24									Data appear Normal at 5% Significance Level	

425					Theta Star	0.000541						
426					nu star	275.8						
427					Approximate Chi Square Value (.05)	238.3				**Nonparametric Statistics**		
428					Adjusted Level of Significance	0.0195					95% CLT UCL	0.0104
429					Adjusted Chi Square Value	229.5					95% Jackknife UCL	0.0106
430											95% Standard Bootstrap UCL	0.0103
431					Anderson-Darling Test Statistic	0.214					95% Bootstrap-t UCL	0.0105
432					Anderson-Darling 5% Critical Value	0.716					95% Hall's Bootstrap UCL	0.0106
433					Kolmogorov-Smirnov Test Statistic	0.167					95% Percentile Bootstrap UCL	0.0103
434					Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	0.0103
435					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0122
436											97.5% Chebyshev(Mean, Sd) UCL	0.0134
437					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0159
438					95% Approximate Gamma UCL	0.0108						
439					95% Adjusted Gamma UCL	0.0112						
440												
441					**Potential UCL to Use**						Use 95% Student's-t UCL	0.0106
442												
443												
444	**Chromium, dissolved (cw-4d)**											
445												
446						**General Statistics**						
447					Number of Valid Data	8				Number of Detected Data	4	
448					Number of Distinct Detected Data	3				Number of Non-Detect Data	4	
449										Percent Non-Detects	50.00%	
450												
451					**Raw Statistics**					**Log-transformed Statistics**		
452					Minimum Detected	0.0024				Minimum Detected	-6.032	
453					Maximum Detected	0.00373				Maximum Detected	-5.591	
454					Mean of Detected	0.00303				Mean of Detected	-5.821	
455					SD of Detected	0.0007323				SD of Detected	0.245	
456					Minimum Non-Detect	0.001				Minimum Non-Detect	-6.908	
457					Maximum Non-Detect	0.001				Maximum Non-Detect	-6.908	
458												
459												
460					**Warning: There are only 3 Distinct Detected Values in this data set**							
461					**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**							
462					**Those methods will return a 'N/A' value on your output display!**							
463												
464					**It is necessary to have 4 or more Distinct Values for bootstrap methods.**							
465					**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**							
466												
467												
468						**UCL Statistics**						
469					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
470					Shapiro Wilk Test Statistic	0.773				Shapiro Wilk Test Statistic	0.766	
471					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value	0.748	
472					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
473												
474					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
475					DL/2 Substitution Method					DL/2 Substitution Method		
476					Mean	0.00177				Mean	-6.711	
477					SD	0.00144				SD	0.965	

478				95% DL/2 (t) UCL	0.00273					95% H-Stat (DL/2) UCL	0.0043	
479												
480				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
481				Mean	0.00127					Mean in Log Scale	-6.183	
482				SD	0.002					SD in Log Scale	0.443	
483				95% MLE (t) UCL	0.0026					Mean in Original Scale	0.00225	
484				95% MLE (Tiku) UCL	0.00291					SD in Original Scale	0.0009874	
485										95% Percentile Bootstrap UCL	0.00281	
486										95% BCA Bootstrap UCL	0.00283	
487												
488				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
489				k star (bias corrected)	5.809					**Data appear Normal at 5% Significance Level**		
490				Theta Star	0.000522							
491				nu star	46.47							
492												
493				A-D Test Statistic	0.642					**Nonparametric Statistics**		
494				5% A-D Critical Value	0.657					Kaplan-Meier (KM) Method		
495				K-S Test Statistic	0.657					Mean	0.00272	
496				5% K-S Critical Value	0.394					SD	0.0005487	
497				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.000224	
498										95% KM (t) UCL	0.00314	
499				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00308	
500				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00311	
501				Minimum	0.0022					95% KM (bootstrap t) UCL	0.00296	
502				Maximum	0.00373					95% KM (BCA) UCL	0.00362	
503				Mean	0.00303					95% KM (Percentile Bootstrap) UCL	0.00362	
504				Median	0.00311					95% KM (Chebyshev) UCL	0.00369	
505				SD	0.0006424					97.5% KM (Chebyshev) UCL	0.00412	
506				k star	15.43					99% KM (Chebyshev) UCL	0.00495	
507				Theta star	0.0001965							
508				Nu star	246.9					**Potential UCLs to Use**		
509				AppChi2	211.6					95% KM (t) UCL	0.00314	
510				95% Gamma Approximate UCL	0.00354					95% KM (Percentile Bootstrap) UCL	0.00362	
511				95% Adjusted Gamma UCL	N/A							
512	**Note: DL/2 is not a recommended method.**											
513												
514												
515	**Chromium, dissolved (cw-4m)**											
516												
517						**General Statistics**							
518				Number of Valid Observations	8					Number of Distinct Observations	8	
519												
520				**Raw Statistics**						**Log-transformed Statistics**		
521				Minimum	0.0024					Minimum of Log Data	-6.032	
522				Maximum	0.0218					Maximum of Log Data	-3.826	
523				Mean	0.0159					Mean of log Data	-4.302	
524				Median	0.0179					SD of log Data	0.739	
525				SD	0.00663							
526				Coefficient of Variation	0.417							
527				Skewness	-1.376							
528												
529												
530						**Warning: There are only 8 Values in this data**							

	A	B	C	D	E	F	G	H	I	J	K	L
531	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
532	**the resulting calculations may not be reliable enough to draw conclusions**											
533												
534	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
535												
536	**Relevant UCL Statistics**											
537	**Normal Distribution Test**						**Lognormal Distribution Test**					
538	Shapiro Wilk Test Statistic					0.862	Shapiro Wilk Test Statistic					0.688
539	Shapiro Wilk Critical Value					0.818	Shapiro Wilk Critical Value					0.818
540	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
541												
542	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
543	95% Student's-t UCL					0.0203	95% H-UCL					0.0391
544	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0369
545	95% Adjusted-CLT UCL					0.0185	97.5% Chebyshev (MVUE) UCL					0.0455
546	95% Modified-t UCL					0.0201	99% Chebyshev (MVUE) UCL					0.0623
547												
548	**Gamma Distribution Test**						**Data Distribution**					
549	k star (bias corrected)					2.144	**Data appear Normal at 5% Significance Level**					
550	Theta Star					0.0074						
551	nu star					34.3						
552	Approximate Chi Square Value (.05)					21.91	**Nonparametric Statistics**					
553	Adjusted Level of Significance					0.0195	95% CLT UCL					0.0197
554	Adjusted Chi Square Value					19.44	95% Jackknife UCL					0.0203
555							95% Standard Bootstrap UCL					0.0195
556	Anderson-Darling Test Statistic					0.906	95% Bootstrap-t UCL					0.0193
557	Anderson-Darling 5% Critical Value					0.721	95% Hall's Bootstrap UCL					0.0188
558	Kolmogorov-Smirnov Test Statistic					0.279	95% Percentile Bootstrap UCL					0.0191
559	Kolmogorov-Smirnov 5% Critical Value					0.296	95% BCA Bootstrap UCL					0.0187
560	**Data follow Appr. Gamma Distribution at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.0261
561							97.5% Chebyshev(Mean, Sd) UCL					0.0305
562	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.0392
563	95% Approximate Gamma UCL					0.0249						
564	95% Adjusted Gamma UCL					0.028						
565												
566	**Potential UCL to Use**						Use 95% Student's-t UCL					0.0203
567												
568												
569	**Chromium, dissolved (mw-1)**											
570												
571	**General Statistics**											
572	Number of Valid Data					9	Number of Detected Data					6
573	Number of Distinct Detected Data					5	Number of Non-Detect Data					3
574							Percent Non-Detects					33.33%
575												
576	**Raw Statistics**						**Log-transformed Statistics**					
577	Minimum Detected					0.004	Log Statistics Not Avaliable					
578	Maximum Detected					0.23						
579	Mean of Detected					0.0448						
580	Mean of Detected					0.0448						
581	Mean of Detected					0.0448						
582	Maximum Non-Detect					0.02						
583	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					8

584	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
585	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	88.89%
586												
587	**Warning: There are only 6 Detected Values in this data**											
588	**Note: It should be noted that even though bootstrap may be performed on this data set**											
589	**the resulting calculations may not be reliable enough tp draw conclusions**											
590												
591	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
592												
593												
594	**UCL Statistics**											
595	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
596	Shapiro Wilk Test Statistic			0.526			Not Available					
597	5% Shapiro Wilk Critical Value			0.788								
598	**Data not Normal at 5% Significance Level**											
599												
600	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
601	DL/2 Substitution Method						DL/2 Substitution Method					N/A
602	Mean			0.0321								
603	SD			0.0743								
604	95% DL/2 (t) UCL			0.0781								
605												
606	Maximum Likelihood Estimate(MLE) Method			N/A			Log ROS Method					N/A
607												
608	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
609	Gamma Statistics Not Available						Data do not follow a Discernable Distribution (0.05)					
610												
611												
612	**Potential UCLs to Use**						**Nonparametric Statistics**					
613	99% KM (Chebyshev) UCL			0.287			Kaplan-Meier (KM) Method					
614							Mean					0.0319
615							SD					0.0701
616							SE of Mean					0.0256
617							95% KM (t) UCL					0.0795
618							95% KM (z) UCL					0.074
619							95% KM (jackknife) UCL					0.0778
620							95% KM (bootstrap t) UCL					0.787
621							95% KM (BCA) UCL					0.0817
622							95% KM (Percentile Bootstrap) UCL					0.0815
623							95% KM (Chebyshev) UCL					0.143
624							97.5% KM (Chebyshev) UCL					0.192
625							99% KM (Chebyshev) UCL					0.287
626	**Warning: Recommended UCL exceeds the maximum observation**											
627	**Note: DL/2 is not a recommended method.**											
628												
629												
630	**Chromium, dissolved (mw-10)**											
631												
632	**General Statistics**											
633	Number of Valid Observations			38			Number of Distinct Observations					30
634												
635	**Raw Statistics**						**Log-transformed Statistics**					
636	Minimum			0.473			Minimum of Log Data					-0.749

637					Maximum	4.9					Maximum of Log Data	1.589
638					Mean	1.91					Mean of log Data	0.547
639					Median	1.75					SD of log Data	0.458
640					SD	0.908						
641					Coefficient of Variation	0.475						
642					Skewness	1.465						
643												
644	**Relevant UCL Statistics**											
645	**Normal Distribution Test**						**Lognormal Distribution Test**					
646					Shapiro Wilk Test Statistic	0.891					Shapiro Wilk Test Statistic	0.983
647					Shapiro Wilk Critical Value	0.938					Shapiro Wilk Critical Value	0.938
648	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
649												
650	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
651					95% Student's-t UCL	2.158					95% H-UCL	2.209
652	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	2.556
653					95% Adjusted-CLT UCL	2.189					97.5% Chebyshev (MVUE) UCL	2.834
654					95% Modified-t UCL	2.164					99% Chebyshev (MVUE) UCL	3.381
655												
656	**Gamma Distribution Test**						**Data Distribution**					
657					k star (bias corrected)	4.761	**Data appear Gamma Distributed at 5% Significance Level**					
658					Theta Star	0.401						
659					nu star	361.8						
660					Approximate Chi Square Value (.05)	318.7	**Nonparametric Statistics**					
661					Adjusted Level of Significance	0.0434					95% CLT UCL	2.152
662					Adjusted Chi Square Value	317.1					95% Jackknife UCL	2.158
663											95% Standard Bootstrap UCL	2.163
664					Anderson-Darling Test Statistic	0.4					95% Bootstrap-t UCL	2.215
665					Anderson-Darling 5% Critical Value	0.751					95% Hall's Bootstrap UCL	2.247
666					Kolmogorov-Smirnov Test Statistic	0.1					95% Percentile Bootstrap UCL	2.159
667					Kolmogorov-Smirnov 5% Critical Value	0.144					95% BCA Bootstrap UCL	2.173
668	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	2.552
669											97.5% Chebyshev(Mean, Sd) UCL	2.829
670	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	3.375
671					95% Approximate Gamma UCL	2.168						
672					95% Adjusted Gamma UCL	2.179						
673												
674	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	2.168
675												
676												
677	**Chromium, dissolved (mw-11)**											
678												
679	**General Statistics**											
680					Number of Valid Observations	35					Number of Distinct Observations	33
681												
682	**Raw Statistics**						**Log-transformed Statistics**					
683					Minimum	0.07					Minimum of Log Data	-2.659
684					Maximum	1.7					Maximum of Log Data	0.531
685					Mean	0.585					Mean of log Data	-0.678
686					Median	0.453					SD of log Data	0.56
687					SD	0.337						
688					Coefficient of Variation	0.576						
689					Skewness	1.713						

690												
691	**Relevant UCL Statistics**											
692	**Normal Distribution Test**						**Lognormal Distribution Test**					
693				Shapiro Wilk Test Statistic	0.823					Shapiro Wilk Test Statistic	0.903	
694				Shapiro Wilk Critical Value	0.934					Shapiro Wilk Critical Value	0.934	
695	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
696												
697	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
698				95% Student's-t UCL	0.682					95% H-UCL	0.717	
699	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.848	
700				95% Adjusted-CLT UCL	0.697					97.5% Chebyshev (MVUE) UCL	0.96	
701				95% Modified-t UCL	0.685					99% Chebyshev (MVUE) UCL	1.179	
702												
703	**Gamma Distribution Test**						**Data Distribution**					
704				k star (bias corrected)	3.362		**Data do not follow a Discernable Distribution (0.05)**					
705				Theta Star	0.174							
706				nu star	235.3							
707				Approximate Chi Square Value (.05)	200.8		**Nonparametric Statistics**					
708				Adjusted Level of Significance	0.0425					95% CLT UCL	0.679	
709				Adjusted Chi Square Value	199.3					95% Jackknife UCL	0.682	
710										95% Standard Bootstrap UCL	0.679	
711				Anderson-Darling Test Statistic	1.19					95% Bootstrap-t UCL	0.717	
712				Anderson-Darling 5% Critical Value	0.753					95% Hall's Bootstrap UCL	0.713	
713				Kolmogorov-Smirnov Test Statistic	0.176					95% Percentile Bootstrap UCL	0.682	
714				Kolmogorov-Smirnov 5% Critical Value	0.149					95% BCA Bootstrap UCL	0.688	
715	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.834	
716										97.5% Chebyshev(Mean, Sd) UCL	0.941	
717	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	1.153	
718				95% Approximate Gamma UCL	0.686							
719				95% Adjusted Gamma UCL	0.691							
720												
721	**Potential UCL to Use**									Use 95% Chebyshev (Mean, Sd) UCL	0.834	
722												
723												
724	**Chromium, dissolved (mw-12)**											
725												
726	**General Statistics**											
727				Number of Valid Observations	41					Number of Distinct Observations	38	
728												
729	**Raw Statistics**						**Log-transformed Statistics**					
730				Minimum	0.34					Minimum of Log Data	-1.079	
731				Maximum	2.93					Maximum of Log Data	1.075	
732				Mean	1.252					Mean of log Data	0.052	
733				Median	1					SD of log Data	0.602	
734				SD	0.758							
735				Coefficient of Variation	0.605							
736				Skewness	1.056							
737												
738	**Relevant UCL Statistics**											
739	**Normal Distribution Test**						**Lognormal Distribution Test**					
740				Shapiro Wilk Test Statistic	0.862					Shapiro Wilk Test Statistic	0.956	
741				Shapiro Wilk Critical Value	0.941					Shapiro Wilk Critical Value	0.941	
742	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					

743												
744	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
745					95% Student's-t UCL	1.451					95% H-UCL	1.524
746	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	1.807
747					95% Adjusted-CLT UCL	1.468					97.5% Chebyshev (MVUE) UCL	2.045
748					95% Modified-t UCL	1.455					99% Chebyshev (MVUE) UCL	2.513
749												
750	**Gamma Distribution Test**						**Data Distribution**					
751					k star (bias corrected)	2.842	**Data appear Gamma Distributed at 5% Significance Level**					
752					Theta Star	0.441						
753					nu star	233						
754					Approximate Chi Square Value (.05)	198.7	**Nonparametric Statistics**					
755					Adjusted Level of Significance	0.0441					95% CLT UCL	1.447
756					Adjusted Chi Square Value	197.5					95% Jackknife UCL	1.451
757											95% Standard Bootstrap UCL	1.444
758					Anderson-Darling Test Statistic	0.523					95% Bootstrap-t UCL	1.48
759					Anderson-Darling 5% Critical Value	0.755					95% Hall's Bootstrap UCL	1.475
760					Kolmogorov-Smirnov Test Statistic	0.101					95% Percentile Bootstrap UCL	1.444
761					Kolmogorov-Smirnov 5% Critical Value	0.139					95% BCA Bootstrap UCL	1.459
762	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	1.768
763											97.5% Chebyshev(Mean, Sd) UCL	1.991
764	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	2.43
765					95% Approximate Gamma UCL	1.469						
766					95% Adjusted Gamma UCL	1.477						
767												
768	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	1.469
769												
770												
771	**Chromium, dissolved (mw-13)**											
772												
773	**General Statistics**											
774					Number of Valid Data	36					Number of Detected Data	35
775					Number of Distinct Detected Data	25					Number of Non-Detect Data	1
776											Percent Non-Detects	2.78%
777												
778	**Raw Statistics**						**Log-transformed Statistics**					
779					Minimum Detected	0.01					Minimum Detected	-4.605
780					Maximum Detected	0.18					Maximum Detected	-1.715
781					Mean of Detected	0.0252					Mean of Detected	-3.839
782					SD of Detected	0.0273					SD of Detected	0.427
783					Minimum Non-Detect	0.02					Minimum Non-Detect	-3.912
784					Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912
785												
786												
787	**UCL Statistics**											
788	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
789					Shapiro Wilk Test Statistic	0.3					Shapiro Wilk Test Statistic	0.637
790					5% Shapiro Wilk Critical Value	0.934					5% Shapiro Wilk Critical Value	0.934
791	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
792												
793	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
794					DL/2 Substitution Method						DL/2 Substitution Method	
795					Mean	0.0248					Mean	-3.86

796				SD	0.027					SD	0.439	
797				95% DL/2 (t) UCL	0.0324					95% H-Stat (DL/2) UCL	0.0268	
798												
799				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
800				Mean	0.00798					Mean in Log Scale	-3.845	
801				SD	0.04					SD in Log Scale	0.422	
802				95% MLE (t) UCL	0.0192					Mean in Original Scale	0.025	
803				95% MLE (Tiku) UCL	0.0223					SD in Original Scale	0.0269	
804										95% Percentile Bootstrap UCL	0.0339	
805										95% BCA Bootstrap UCL	0.0388	
806												
807	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
808				k star (bias corrected)	3.043					**Data do not follow a Discernable Distribution (0.05)**		
809				Theta Star	0.00829							
810				nu star	213							
811												
812				A-D Test Statistic	5.584					**Nonparametric Statistics**		
813				5% A-D Critical Value	0.753					Kaplan-Meier (KM) Method		
814				K-S Test Statistic	0.753					Mean	0.025	
815				5% K-S Critical Value	0.15					SD	0.0265	
816	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00449	
817										95% KM (t) UCL	0.0326	
818	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0324	
819				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0326	
820				Minimum	0.01					95% KM (bootstrap t) UCL	0.0619	
821				Maximum	0.18					95% KM (BCA) UCL	0.0339	
822				Mean	0.025					95% KM (Percentile Bootstrap) UCL	0.0337	
823				Median	0.0196					95% KM (Chebyshev) UCL	0.0446	
824				SD	0.0269					97.5% KM (Chebyshev) UCL	0.053	
825				k star	3.11					99% KM (Chebyshev) UCL	0.0697	
826				Theta star	0.00805							
827				Nu star	223.9					**Potential UCLs to Use**		
828				AppChi2	190.3					95% KM (Chebyshev) UCL	0.0446	
829				95% Gamma Approximate UCL	0.0295							
830				95% Adjusted Gamma UCL	0.0297							
831	**Note: DL/2 is not a recommended method.**											
832												
833												
834	**Chromium, dissolved (mw-14)**											
835												
836	**General Statistics**											
837				Number of Valid Observations	36					Number of Distinct Observations	33	
838												
839	**Raw Statistics**									**Log-transformed Statistics**		
840				Minimum	0.0134					Minimum of Log Data	-4.313	
841				Maximum	0.1					Maximum of Log Data	-2.303	
842				Mean	0.033					Mean of log Data	-3.462	
843				Median	0.031					SD of log Data	0.301	
844				SD	0.0131							
845				Coefficient of Variation	0.398							
846				Skewness	3.908							
847												
848	**Relevant UCL Statistics**											

849	**Normal Distribution Test**						**Lognormal Distribution Test**					
850					Shapiro Wilk Test Statistic	0.624					Shapiro Wilk Test Statistic	0.86
851					Shapiro Wilk Critical Value	0.935					Shapiro Wilk Critical Value	0.935
852	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
853												
854	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
855					95% Student's-t UCL	0.0367					95% H-UCL	0.0359
856	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0401
857					95% Adjusted-CLT UCL	0.0381					97.5% Chebyshev (MVUE) UCL	0.0432
858					95% Modified-t UCL	0.0369					99% Chebyshev (MVUE) UCL	0.0494
859												
860	**Gamma Distribution Test**						**Data Distribution**					
861					k star (bias corrected)	9.303	**Data do not follow a Discernable Distribution (0.05)**					
862					Theta Star	0.00354						
863					nu star	669.8						
864					Approximate Chi Square Value (.05)	610.8	**Nonparametric Statistics**					
865					Adjusted Level of Significance	0.0428					95% CLT UCL	0.0366
866					Adjusted Chi Square Value	608.2					95% Jackknife UCL	0.0367
867											95% Standard Bootstrap UCL	0.0365
868					Anderson-Darling Test Statistic	2.131					95% Bootstrap-t UCL	0.0399
869					Anderson-Darling 5% Critical Value	0.748					95% Hall's Bootstrap UCL	0.0539
870					Kolmogorov-Smirnov Test Statistic	0.187					95% Percentile Bootstrap UCL	0.037
871					Kolmogorov-Smirnov 5% Critical Value	0.147					95% BCA Bootstrap UCL	0.039
872	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.0425
873											97.5% Chebyshev(Mean, Sd) UCL	0.0466
874	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.0547
875					95% Approximate Gamma UCL	0.0362						
876					95% Adjusted Gamma UCL	0.0363						
877												
878	**Potential UCL to Use**										Use 95% Student's-t UCL	0.0367
879											or 95% Modified-t UCL	0.0369
880												
881												
882	**Chromium, dissolved (mw-15)**											
883												
884	**General Statistics**											
885					Number of Valid Data	31					Number of Detected Data	27
886					Number of Distinct Detected Data	22					Number of Non-Detect Data	4
887											Percent Non-Detects	12.90%
888												
889	**Raw Statistics**						**Log-transformed Statistics**					
890					Minimum Detected	0.0065					Minimum Detected	-5.036
891					Maximum Detected	0.023					Maximum Detected	-3.772
892					Mean of Detected	0.0128					Mean of Detected	-4.415
893					SD of Detected	0.00436					SD of Detected	0.331
894					Minimum Non-Detect	0.02					Minimum Non-Detect	-3.912
895					Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912
896												
897												
898	**UCL Statistics**											
899	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
900					Shapiro Wilk Test Statistic	0.915					Shapiro Wilk Test Statistic	0.963
901					5% Shapiro Wilk Critical Value	0.923					5% Shapiro Wilk Critical Value	0.923

902	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
903												
904	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
905	DL/2 Substitution Method						DL/2 Substitution Method					
906	Mean					0.0124	Mean					-4.439
907	SD					0.00417	SD					0.315
908	95% DL/2 (t) UCL					0.0137	95% H-Stat (DL/2) UCL					0.0156
909												
910	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
911	Mean					0.0158	Mean in Log Scale					-4.423
912	SD					0.00322	SD in Log Scale					0.317
913	95% MLE (t) UCL					0.0168	Mean in Original Scale					0.0126
914	95% MLE (Tiku) UCL					0.0201	SD in Original Scale					0.00416
915							95% Percentile Bootstrap UCL					0.0138
916							95% BCA Bootstrap UCL					0.014
917												
918	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
919	k star (bias corrected)					8.486	**Data appear Gamma Distributed at 5% Significance Level**					
920	Theta Star					0.0015						
921	nu star					458.3						
922												
923	A-D Test Statistic					0.487	**Nonparametric Statistics**					
924	5% A-D Critical Value					0.744	Kaplan-Meier (KM) Method					
925	K-S Test Statistic					0.744	Mean					0.0126
926	5% K-S Critical Value					0.168	SD					0.00416
927	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0007923
928							95% KM (t) UCL					0.014
929	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0139
930	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.014
931	Minimum					0.0065	95% KM (bootstrap t) UCL					0.0141
932	Maximum					0.023	95% KM (BCA) UCL					0.014
933	Mean					0.0128	95% KM (Percentile Bootstrap) UCL					0.0139
934	Median					0.012	95% KM (Chebyshev) UCL					0.0161
935	SD					0.00412	97.5% KM (Chebyshev) UCL					0.0176
936	k star					9.603	99% KM (Chebyshev) UCL					0.0205
937	Theta star					0.00133						
938	Nu star					595.4	**Potential UCLs to Use**					
939	AppChi2					539.8	95% KM (BCA) UCL					0.014
940	95% Gamma Approximate UCL					0.0141						
941	95% Adjusted Gamma UCL					0.0142						
942	**Note: DL/2 is not a recommended method.**											
943												
944												
945	**Chromium, dissolved (mw-19)**											
946												
947	**General Statistics**											
948	Number of Valid Observations					33	Number of Distinct Observations					31
949												
950	**Raw Statistics**						**Log-transformed Statistics**					
951	Minimum					0.589	Minimum of Log Data					-0.529
952	Maximum					1.51	Maximum of Log Data					0.412
953	Mean					0.832	Mean of log Data					-0.222
954	Median					0.73	SD of log Data					0.271

955					SD	0.246						
956					Coefficient of Variation	0.295						
957					Skewness	1.088						
958												
959	**Relevant UCL Statistics**											
960	**Normal Distribution Test**						**Lognormal Distribution Test**					
961					Shapiro Wilk Test Statistic	0.847					Shapiro Wilk Test Statistic	0.882
962					Shapiro Wilk Critical Value	0.931					Shapiro Wilk Critical Value	0.931
963	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
964												
965	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
966					95% Student's-t UCL	0.904					95% H-UCL	0.905
967	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	1.003
968					95% Adjusted-CLT UCL	0.911					97.5% Chebyshev (MVUE) UCL	1.078
969					95% Modified-t UCL	0.906					99% Chebyshev (MVUE) UCL	1.225
970												
971	**Gamma Distribution Test**						**Data Distribution**					
972					k star (bias corrected)	12.25	**Data do not follow a Discernable Distribution (0.05)**					
973					Theta Star	0.0679						
974					nu star	808.7						
975					Approximate Chi Square Value (.05)	743.7	**Nonparametric Statistics**					
976					Adjusted Level of Significance	0.0419					95% CLT UCL	0.902
977					Adjusted Chi Square Value	740.5					95% Jackknife UCL	0.904
978											95% Standard Bootstrap UCL	0.902
979					Anderson-Darling Test Statistic	1.607					95% Bootstrap-t UCL	0.91
980					Anderson-Darling 5% Critical Value	0.747					95% Hall's Bootstrap UCL	0.908
981					Kolmogorov-Smirnov Test Statistic	0.187					95% Percentile Bootstrap UCL	0.905
982					Kolmogorov-Smirnov 5% Critical Value	0.153					95% BCA Bootstrap UCL	0.911
983	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	1.018
984											97.5% Chebyshev(Mean, Sd) UCL	1.099
985	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	1.257
986					95% Approximate Gamma UCL	0.905						
987					95% Adjusted Gamma UCL	0.909						
988												
989	**Potential UCL to Use**										Use 95% Student's-t UCL	0.904
990											or 95% Modified-t UCL	0.906
991												
992												
993	**Chromium, dissolved (mw-20-100)**											
994												
995	**General Statistics**											
996					Number of Valid Observations	36					Number of Distinct Observations	31
997												
998	**Raw Statistics**						**Log-transformed Statistics**					
999					Minimum	1.5					Minimum of Log Data	0.405
1000					Maximum	12.1					Maximum of Log Data	2.493
1001					Mean	5.217					Mean of log Data	1.443
1002					Median	3.085					SD of log Data	0.645
1003					SD	3.496						
1004					Coefficient of Variation	0.67						
1005					Skewness	0.774						
1006												
1007	**Relevant UCL Statistics**											

1008	**Normal Distribution Test**						**Lognormal Distribution Test**					
1009	Shapiro Wilk Test Statistic				0.784		Shapiro Wilk Test Statistic					0.857
1010	Shapiro Wilk Critical Value				0.935		Shapiro Wilk Critical Value					0.935
1011	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1012												
1013	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1014	95% Student's-t UCL				6.202		95% H-UCL					6.5
1015	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					7.783
1016	95% Adjusted-CLT UCL				6.256		97.5% Chebyshev (MVUE) UCL					8.911
1017	95% Modified-t UCL				6.214		99% Chebyshev (MVUE) UCL					11.13
1018												
1019	**Gamma Distribution Test**						**Data Distribution**					
1020	k star (bias corrected)				2.354		**Data do not follow a Discernable Distribution (0.05)**					
1021	Theta Star				2.217							
1022	nu star				169.5							
1023	Approximate Chi Square Value (.05)				140.4		**Nonparametric Statistics**					
1024	Adjusted Level of Significance				0.0428		95% CLT UCL					6.176
1025	Adjusted Chi Square Value				139.2		95% Jackknife UCL					6.202
1026							95% Standard Bootstrap UCL					6.173
1027	Anderson-Darling Test Statistic				2.698		95% Bootstrap-t UCL					6.404
1028	Anderson-Darling 5% Critical Value				0.756		95% Hall's Bootstrap UCL					6.239
1029	Kolmogorov-Smirnov Test Statistic				0.232		95% Percentile Bootstrap UCL					6.211
1030	Kolmogorov-Smirnov 5% Critical Value				0.148		95% BCA Bootstrap UCL					6.238
1031	**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					7.757
1032							97.5% Chebyshev(Mean, Sd) UCL					8.856
1033	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					11.02
1034	95% Approximate Gamma UCL				6.299							
1035	95% Adjusted Gamma UCL				6.353							
1036												
1037	**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL					7.757
1038												
1039												
1040	**Chromium, dissolved (mw-20-130)**											
1041												
1042	**General Statistics**											
1043	Number of Valid Observations				37		Number of Distinct Observations					34
1044												
1045	**Raw Statistics**						**Log-transformed Statistics**					
1046	Minimum				4.1		Minimum of Log Data					1.411
1047	Maximum				16.4		Maximum of Log Data					2.797
1048	Mean				7.974		Mean of log Data					2.002
1049	Median				7.09		SD of log Data					0.382
1050	SD				3.278							
1051	Coefficient of Variation				0.411							
1052	Skewness				1.057							
1053												
1054	**Relevant UCL Statistics**											
1055	**Normal Distribution Test**						**Lognormal Distribution Test**					
1056	Shapiro Wilk Test Statistic				0.881		Shapiro Wilk Test Statistic					0.94
1057	Shapiro Wilk Critical Value				0.936		Shapiro Wilk Critical Value					0.936
1058	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1059												
1060	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					

1061				95% Student's-t UCL	8.884					95% H-UCL	8.949
1062				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	10.19
1063				95% Adjusted-CLT UCL	8.961					97.5% Chebyshev (MVUE) UCL	11.15
1064				95% Modified-t UCL	8.9					99% Chebyshev (MVUE) UCL	13.05
1065											
1066				**Gamma Distribution Test**						**Data Distribution**	
1067				k star (bias corrected)	6.376					**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
1068				Theta Star	1.251						
1069				nu star	471.8						
1070				Approximate Chi Square Value (.05)	422.5					**Nonparametric Statistics**	
1071				Adjusted Level of Significance	0.0431					95% CLT UCL	8.861
1072				Adjusted Chi Square Value	420.4					95% Jackknife UCL	8.884
1073										95% Standard Bootstrap UCL	8.834
1074				Anderson-Darling Test Statistic	0.855					95% Bootstrap-t UCL	9.01
1075				Anderson-Darling 5% Critical Value	0.75					95% Hall's Bootstrap UCL	8.977
1076				Kolmogorov-Smirnov Test Statistic	0.138					95% Percentile Bootstrap UCL	8.854
1077				Kolmogorov-Smirnov 5% Critical Value	0.145					95% BCA Bootstrap UCL	8.992
1078				**Data follow Appr. Gamma Distribution at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	10.32
1079										97.5% Chebyshev(Mean, Sd) UCL	11.34
1080				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	13.34
1081				95% Approximate Gamma UCL	8.906						
1082				95% Adjusted Gamma UCL	8.949						
1083											
1084				**Potential UCL to Use**						Use 95% Approximate Gamma UCL	8.906
1085											
1086											
1087	**Chromium, dissolved (mw-20-70)**										
1088											
1089				**General Statistics**							
1090				Number of Valid Observations	38					Number of Distinct Observations	36
1091											
1092				**Raw Statistics**						**Log-transformed Statistics**	
1093				Minimum	2.14					Minimum of Log Data	0.761
1094				Maximum	15.9					Maximum of Log Data	2.766
1095				Mean	8.967					Mean of log Data	2.091
1096				Median	9.845					SD of log Data	0.507
1097				SD	3.446						
1098				Coefficient of Variation	0.384						
1099				Skewness	-0.489						
1100											
1101				**Relevant UCL Statistics**							
1102				**Normal Distribution Test**						**Lognormal Distribution Test**	
1103				Shapiro Wilk Test Statistic	0.936					Shapiro Wilk Test Statistic	0.843
1104				Shapiro Wilk Critical Value	0.938					Shapiro Wilk Critical Value	0.938
1105				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
1106											
1107				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1108				95% Student's-t UCL	9.91					95% H-UCL	10.79
1109				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	12.62
1110				95% Adjusted-CLT UCL	9.839					97.5% Chebyshev (MVUE) UCL	14.11
1111				95% Modified-t UCL	9.903					99% Chebyshev (MVUE) UCL	17.04
1112											
1113				**Gamma Distribution Test**						**Data Distribution**	

1114				k star (bias corrected)	4.657		**Data do not follow a Discernable Distribution (0.05)**					
1115				Theta Star	1.925							
1116				nu star	353.9							
1117				Approximate Chi Square Value (.05)	311.3		**Nonparametric Statistics**					
1118				Adjusted Level of Significance	0.0434					95% CLT UCL	9.887	
1119				Adjusted Chi Square Value	309.7					95% Jackknife UCL	9.91	
1120										95% Standard Bootstrap UCL	9.876	
1121				Anderson-Darling Test Statistic	1.907					95% Bootstrap-t UCL	9.851	
1122				Anderson-Darling 5% Critical Value	0.751					95% Hall's Bootstrap UCL	9.862	
1123				Kolmogorov-Smirnov Test Statistic	0.187					95% Percentile Bootstrap UCL	9.857	
1124				Kolmogorov-Smirnov 5% Critical Value	0.144					95% BCA Bootstrap UCL	9.818	
1125				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	11.4	
1126										97.5% Chebyshev(Mean, Sd) UCL	12.46	
1127				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	14.53	
1128				95% Approximate Gamma UCL	10.19							
1129				95% Adjusted Gamma UCL	10.25							
1130												
1131				**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	11.4	
1132												
1133												
1134	**Chromium, dissolved (mw-21)**											
1135												
1136					**General Statistics**							
1137				Number of Valid Data	42					Number of Detected Data	11	
1138				Number of Distinct Detected Data	11					Number of Non-Detect Data	31	
1139										Percent Non-Detects	73.81%	
1140												
1141				**Raw Statistics**						**Log-transformed Statistics**		
1142				Minimum Detected	0.0014					Minimum Detected	-6.571	
1143				Maximum Detected	0.016					Maximum Detected	-4.135	
1144				Mean of Detected	0.00597					Mean of Detected	-5.466	
1145				SD of Detected	0.00526					SD of Detected	0.866	
1146				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
1147				Maximum Non-Detect	0.8					Maximum Non-Detect	-0.223	
1148												
1149	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	42	
1150	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1151	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1152												
1153					**UCL Statistics**							
1154				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
1155				Shapiro Wilk Test Statistic	0.812					Shapiro Wilk Test Statistic	0.915	
1156				5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85	
1157				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
1158												
1159				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
1160				DL/2 Substitution Method						DL/2 Substitution Method		
1161				Mean	0.0133					Mean	-6.263	
1162				SD	0.0613					SD	1.587	
1163				95% DL/2 (t) UCL	0.0293					95% H-Stat (DL/2) UCL	0.0132	
1164												
1165				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1166				**MLE method failed to converge properly**						Mean in Log Scale	-7.287	

1167											SD in Log Scale	1.555
1168											Mean in Original Scale	0.00208
1169											SD in Original Scale	0.00362
1170											95% Percentile Bootstrap UCL	0.00306
1171											95% BCA Bootstrap UCL	0.00335
1172												
1173	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1174				k star (bias corrected)	1.218		**Data appear Gamma Distributed at 5% Significance Level**					
1175				Theta Star	0.0049							
1176				nu star	26.8							
1177												
1178				A-D Test Statistic	0.578		**Nonparametric Statistics**					
1179				5% A-D Critical Value	0.742		Kaplan-Meier (KM) Method					
1180				K-S Test Statistic	0.742		Mean	0.00294				
1181				5% K-S Critical Value	0.259		SD	0.00361				
1182	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0006605				
1183							95% KM (t) UCL	0.00405				
1184	**Assuming Gamma Distribution**						95% KM (z) UCL	0.00403				
1185				Gamma ROS Statistics using Extrapolated Data			95% KM (jackknife) UCL	0.00387				
1186				Minimum	1E-09		95% KM (bootstrap t) UCL	0.00478				
1187				Maximum	0.0341		95% KM (BCA) UCL	0.00453				
1188				Mean	0.0123		95% KM (Percentile Bootstrap) UCL	0.00426				
1189				Median	0.0121		95% KM (Chebyshev) UCL	0.00582				
1190				SD	0.00888		97.5% KM (Chebyshev) UCL	0.00706				
1191				k star	0.761		99% KM (Chebyshev) UCL	0.00951				
1192				Theta star	0.0162							
1193				Nu star	63.89		**Potential UCLs to Use**					
1194				AppChi2	46.5		95% KM (t) UCL	0.00405				
1195				95% Gamma Approximate UCL	0.0169							
1196				95% Adjusted Gamma UCL	0.0171							
1197	**Note: DL/2 is not a recommended method.**											
1198												
1199												
1200	**Chromium, dissolved (mw-22)**											
1201												
1202	**General Statistics**											
1203				Number of Valid Data	38		Number of Detected Data	17				
1204				Number of Distinct Detected Data	16		Number of Non-Detect Data	21				
1205							Percent Non-Detects	55.26%				
1206												
1207	**Raw Statistics**						**Log-transformed Statistics**					
1208				Minimum Detected	0.0015		Minimum Detected	-6.502				
1209				Maximum Detected	0.4		Maximum Detected	-0.916				
1210				Mean of Detected	0.0304		Mean of Detected	-4.947				
1211				SD of Detected	0.0954		SD of Detected	1.301				
1212				Minimum Non-Detect	0.001		Minimum Non-Detect	-6.908				
1213				Maximum Non-Detect	0.8		Maximum Non-Detect	-0.223				
1214												
1215	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	38				
1216	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	0				
1217	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	100.00%				
1218												
1219	**UCL Statistics**											

1220	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1221				Shapiro Wilk Test Statistic	0.306					Shapiro Wilk Test Statistic	0.828	
1222				5% Shapiro Wilk Critical Value	0.892					5% Shapiro Wilk Critical Value	0.892	
1223	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1224												
1225	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1226				DL/2 Substitution Method						DL/2 Substitution Method		
1227				Mean	0.0266					Mean	-5.528	
1228				SD	0.0893					SD	1.717	
1229				95% DL/2 (t) UCL	0.0511					95% H-Stat (DL/2) UCL	0.0402	
1230												
1231				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1232	**MLE method failed to converge properly**									Mean in Log Scale	-6.178	
1233										SD in Log Scale	1.771	
1234										Mean in Original Scale	0.0149	
1235										SD in Original Scale	0.0644	
1236										95% Percentile Bootstrap UCL	0.0352	
1237										95% BCA Bootstrap UCL	0.0478	
1238												
1239	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1240				k star (bias corrected)	0.406		**Data do not follow a Discernable Distribution (0.05)**					
1241				Theta Star	0.075							
1242				nu star	13.79							
1243												
1244				A-D Test Statistic	2.79		**Nonparametric Statistics**					
1245				5% A-D Critical Value	0.81					Kaplan-Meier (KM) Method		
1246				K-S Test Statistic	0.81					Mean	0.0156	
1247				5% K-S Critical Value	0.223					SD	0.0642	
1248	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0109	
1249										95% KM (t) UCL	0.034	
1250	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0335	
1251				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0335	
1252				Minimum	1E-09					95% KM (bootstrap t) UCL	0.184	
1253				Maximum	0.406					95% KM (BCA) UCL	0.0385	
1254				Mean	0.048					95% KM (Percentile Bootstrap) UCL	0.0373	
1255				Median	0.00658					95% KM (Chebyshev) UCL	0.0631	
1256				SD	0.105					97.5% KM (Chebyshev) UCL	0.0837	
1257				k star	0.156					99% KM (Chebyshev) UCL	0.124	
1258				Theta star	0.308							
1259				Nu star	11.84		**Potential UCLs to Use**					
1260				AppChi2	5.119					95% KM (BCA) UCL	0.0385	
1261				95% Gamma Approximate UCL	0.111							
1262				95% Adjusted Gamma UCL	0.115							
1263	**Note: DL/2 is not a recommended method.**											
1264												
1265												
1266	**Chromium, dissolved (mw-23)**											
1267												
1268	**General Statistics**											
1269				Number of Valid Data	38					Number of Detected Data	23	
1270				Number of Distinct Detected Data	22					Number of Non-Detect Data	15	
1271										Percent Non-Detects	39.47%	
1272												

	A	B	C	D	E	F	G	H	I	J	K	L
1273	**Raw Statistics**						**Log-transformed Statistics**					
1274					Minimum Detected	0.0011					Minimum Detected	-6.812
1275					Maximum Detected	1.02					Maximum Detected	0.0198
1276					Mean of Detected	0.0652					Mean of Detected	-4.356
1277					SD of Detected	0.212					SD of Detected	1.476
1278					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
1279					Maximum Non-Detect	0.8					Maximum Non-Detect	-0.223
1280												
1281	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	37
1282	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
1283	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	97.37%
1284												
1285	**UCL Statistics**											
1286	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1287					Shapiro Wilk Test Statistic	0.307					Shapiro Wilk Test Statistic	0.909
1288					5% Shapiro Wilk Critical Value	0.914					5% Shapiro Wilk Critical Value	0.914
1289	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1290												
1291	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1292					DL/2 Substitution Method						DL/2 Substitution Method	
1293					Mean	0.0527					Mean	-4.673
1294					SD	0.176					SD	1.633
1295					95% DL/2 (t) UCL	0.101					95% H-Stat (DL/2) UCL	0.13
1296												
1297					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1298	**MLE method failed to converge properly**										Mean in Log Scale	-5.021
1299											SD in Log Scale	1.628
1300											Mean in Original Scale	0.0413
1301											SD in Original Scale	0.166
1302											95% Percentile Bootstrap UCL	0.0931
1303											95% BCA Bootstrap UCL	0.125
1304												
1305	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1306					k star (bias corrected)	0.38	**Data do not follow a Discernable Distribution (0.05)**					
1307					Theta Star	0.171						
1308					nu star	17.5						
1309												
1310					A-D Test Statistic	3.096	**Nonparametric Statistics**					
1311					5% A-D Critical Value	0.826					Kaplan-Meier (KM) Method	
1312					K-S Test Statistic	0.826					Mean	0.0417
1313					5% K-S Critical Value	0.194					SD	0.164
1314	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0272
1315											95% KM (t) UCL	0.0877
1316	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0865
1317					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0872
1318					Minimum	1E-09					95% KM (bootstrap t) UCL	0.588
1319					Maximum	1.02					95% KM (BCA) UCL	0.0949
1320					Mean	0.0675					95% KM (Percentile Bootstrap) UCL	0.0955
1321					Median	0.0226					95% KM (Chebyshev) UCL	0.16
1322					SD	0.165					97.5% KM (Chebyshev) UCL	0.212
1323					k star	0.426					99% KM (Chebyshev) UCL	0.313
1324					Theta star	0.158						
1325					Nu star	32.37	**Potential UCLs to Use**					

1326					AppChi2	20.37					97.5% KM (Chebyshev) UCL	0.212
1327					95% Gamma Approximate UCL	0.107						
1328					95% Adjusted Gamma UCL	0.109						
1329	**Note: DL/2 is not a recommended method.**											
1330												
1331												
1332	**Chromium, dissolved (mw-24a)**											
1333												
1334	**General Statistics**											
1335	Number of Valid Observations					34	Number of Distinct Observations					29
1336												
1337	**Raw Statistics**						**Log-transformed Statistics**					
1338	Minimum					0.01	Minimum of Log Data					-4.605
1339	Maximum					4.26	Maximum of Log Data					1.449
1340	Mean					3.136	Mean of log Data					0.985
1341	Median					3.11	SD of log Data					1.007
1342	SD					0.823						
1343	Coefficient of Variation					0.262						
1344	Skewness					-1.527						
1345												
1346	**Relevant UCL Statistics**											
1347	**Normal Distribution Test**						**Lognormal Distribution Test**					
1348	Shapiro Wilk Test Statistic					0.884	Shapiro Wilk Test Statistic					0.337
1349	Shapiro Wilk Critical Value					0.933	Shapiro Wilk Critical Value					0.933
1350	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1351												
1352	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1353	95% Student's-t UCL					3.375	95% H-UCL					6.775
1354	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					8.139
1355	95% Adjusted-CLT UCL					3.329	97.5% Chebyshev (MVUE) UCL					9.779
1356	95% Modified-t UCL					3.369	99% Chebyshev (MVUE) UCL					13
1357												
1358	**Gamma Distribution Test**						**Data Distribution**					
1359	k star (bias corrected)					3.049	**Data do not follow a Discernable Distribution (0.05)**					
1360	Theta Star					1.029						
1361	nu star					207.3						
1362	Approximate Chi Square Value (.05)					175	**Nonparametric Statistics**					
1363	Adjusted Level of Significance					0.0422	95% CLT UCL					3.368
1364	Adjusted Chi Square Value					173.5	95% Jackknife UCL					3.375
1365							95% Standard Bootstrap UCL					3.369
1366	Anderson-Darling Test Statistic					5.091	95% Bootstrap-t UCL					3.354
1367	Anderson-Darling 5% Critical Value					0.753	95% Hall's Bootstrap UCL					3.341
1368	Kolmogorov-Smirnov Test Statistic					0.301	95% Percentile Bootstrap UCL					3.356
1369	Kolmogorov-Smirnov 5% Critical Value					0.152	95% BCA Bootstrap UCL					3.323
1370	**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					3.751
1371							97.5% Chebyshev(Mean, Sd) UCL					4.018
1372	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					4.541
1373	95% Approximate Gamma UCL					3.715						
1374	95% Adjusted Gamma UCL					3.747						
1375												
1376	**Potential UCL to Use**						Use 99% Chebyshev (Mean, Sd) UCL					4.541
1377	**Recommended UCL exceeds the maximum observation**											
1378												

1379												
1380	**Chromium, dissolved (mw-24b)**											
1381												
1382						**General Statistics**						
1383					Number of Valid Observations	32			Number of Distinct Observations	27		
1384												
1385				**Raw Statistics**					**Log-transformed Statistics**			
1386					Minimum	0.68			Minimum of Log Data	-0.386		
1387					Maximum	6.26			Maximum of Log Data	1.834		
1388					Mean	4.543			Mean of log Data	1.46		
1389					Median	4.56			SD of log Data	0.397		
1390					SD	1.185						
1391					Coefficient of Variation	0.261						
1392					Skewness	-0.956						
1393												
1394						**Relevant UCL Statistics**						
1395				**Normal Distribution Test**					**Lognormal Distribution Test**			
1396					Shapiro Wilk Test Statistic	0.929			Shapiro Wilk Test Statistic	0.681		
1397					Shapiro Wilk Critical Value	0.93			Shapiro Wilk Critical Value	0.93		
1398				**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**			
1399												
1400				**Assuming Normal Distribution**					**Assuming Lognormal Distribution**			
1401					95% Student's-t UCL	4.898			95% H-UCL	5.314		
1402				**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL	6.106		
1403					95% Adjusted-CLT UCL	4.85			97.5% Chebyshev (MVUE) UCL	6.739		
1404					95% Modified-t UCL	4.892			99% Chebyshev (MVUE) UCL	7.981		
1405												
1406				**Gamma Distribution Test**					**Data Distribution**			
1407					k star (bias corrected)	8.551			**Data do not follow a Discernable Distribution (0.05)**			
1408					Theta Star	0.531						
1409					nu star	547.3						
1410					Approximate Chi Square Value (.05)	494			**Nonparametric Statistics**			
1411					Adjusted Level of Significance	0.0416			95% CLT UCL	4.888		
1412					Adjusted Chi Square Value	491.3			95% Jackknife UCL	4.898		
1413									95% Standard Bootstrap UCL	4.894		
1414					Anderson-Darling Test Statistic	1.317			95% Bootstrap-t UCL	4.88		
1415					Anderson-Darling 5% Critical Value	0.747			95% Hall's Bootstrap UCL	4.849		
1416					Kolmogorov-Smirnov Test Statistic	0.168			95% Percentile Bootstrap UCL	4.868		
1417					Kolmogorov-Smirnov 5% Critical Value	0.155			95% BCA Bootstrap UCL	4.846		
1418				**Data not Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	5.456		
1419									97.5% Chebyshev(Mean, Sd) UCL	5.851		
1420				**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	6.627		
1421					95% Approximate Gamma UCL	5.033						
1422					95% Adjusted Gamma UCL	5.061						
1423												
1424				**Potential UCL to Use**					Use 95% Student's-t UCL	4.898		
1425									or 95% Modified-t UCL	4.892		
1426												
1427												
1428	**Chromium, dissolved (mw-24br)**											
1429												
1430						**General Statistics**						
1431					Number of Valid Data	33			Number of Detected Data	16		

1432					Number of Distinct Detected Data	14					Number of Non-Detect Data	17
1433											Percent Non-Detects	51.52%
1434												
1435					**Raw Statistics**						**Log-transformed Statistics**	
1436					Minimum Detected	0.001					Minimum Detected	-6.908
1437					Maximum Detected	0.38					Maximum Detected	-0.968
1438					Mean of Detected	0.0292					Mean of Detected	-5.177
1439					SD of Detected	0.0937					SD of Detected	1.376
1440					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
1441					Maximum Non-Detect	0.8					Maximum Non-Detect	-0.223
1442												
1443	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	33
1444	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1445	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1446												
1447					**UCL Statistics**							
1448					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
1449					Shapiro Wilk Test Statistic	0.312					Shapiro Wilk Test Statistic	0.811
1450					5% Shapiro Wilk Critical Value	0.887					5% Shapiro Wilk Critical Value	0.887
1451					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
1452												
1453					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1454					DL/2 Substitution Method						DL/2 Substitution Method	
1455					Mean	0.0285					Mean	-5.588
1456					SD	0.0934					SD	1.733
1457					95% DL/2 (t) UCL	0.0561					95% H-Stat (DL/2) UCL	0.0446
1458												
1459					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1460					**MLE method failed to converge properly**						Mean in Log Scale	-6.341
1461											SD in Log Scale	1.813
1462											Mean in Original Scale	0.0151
1463											SD in Original Scale	0.0657
1464											95% Percentile Bootstrap UCL	0.0377
1465											95% BCA Bootstrap UCL	0.0503
1466												
1467					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
1468					k star (bias corrected)	0.367					**Data do not follow a Discernable Distribution (0.05)**	
1469					Theta Star	0.0797						
1470					nu star	11.74						
1471												
1472					A-D Test Statistic	2.937					**Nonparametric Statistics**	
1473					5% A-D Critical Value	0.817					Kaplan-Meier (KM) Method	
1474					K-S Test Statistic	0.817					Mean	0.0158
1475					5% K-S Critical Value	0.23					SD	0.0656
1476					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.012
1477											95% KM (t) UCL	0.0361
1478					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0355
1479					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0357
1480					Minimum	1E-09					95% KM (bootstrap t) UCL	0.239
1481					Maximum	0.38					95% KM (BCA) UCL	0.0417
1482					Mean	0.0413					95% KM (Percentile Bootstrap) UCL	0.0389
1483					Median	0.0035					95% KM (Chebyshev) UCL	0.068
1484					SD	0.098					97.5% KM (Chebyshev) UCL	0.0906

1485					k star	0.136				99% KM (Chebyshev) UCL		0.135
1486					Theta star	0.303						
1487					Nu star	8.975				**Potential UCLs to Use**		
1488					AppChi2	3.312				95% KM (BCA) UCL		0.0417
1489					95% Gamma Approximate UCL	0.112						
1490					95% Adjusted Gamma UCL	0.118						
1491	**Note: DL/2 is not a recommended method.**											
1492												
1493												
1494	**Chromium, dissolved (mw-25)**											
1495												
1496	**General Statistics**											
1497	Number of Valid Observations					32				Number of Distinct Observations		24
1498												
1499	**Raw Statistics**						**Log-transformed Statistics**					
1500	Minimum					0.884				Minimum of Log Data		-0.123
1501	Maximum					3.41				Maximum of Log Data		1.227
1502	Mean					2.22				Mean of log Data		0.74
1503	Median					2.14				SD of log Data		0.361
1504	SD					0.704						
1505	Coefficient of Variation					0.317						
1506	Skewness					-0.221						
1507												
1508	**Relevant UCL Statistics**											
1509	**Normal Distribution Test**						**Lognormal Distribution Test**					
1510	Shapiro Wilk Test Statistic					0.956				Shapiro Wilk Test Statistic		0.92
1511	Shapiro Wilk Critical Value					0.93				Shapiro Wilk Critical Value		0.93
1512	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1513												
1514	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1515	95% Student's-t UCL					2.43				95% H-UCL		2.518
1516	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL		2.868
1517	95% Adjusted-CLT UCL					2.419				97.5% Chebyshev (MVUE) UCL		3.144
1518	95% Modified-t UCL					2.43				99% Chebyshev (MVUE) UCL		3.684
1519												
1520	**Gamma Distribution Test**						**Data Distribution**					
1521	k star (bias corrected)					8.064	**Data appear Normal at 5% Significance Level**					
1522	Theta Star					0.275						
1523	nu star					516.1						
1524	Approximate Chi Square Value (.05)					464.4	**Nonparametric Statistics**					
1525	Adjusted Level of Significance					0.0416	95% CLT UCL					2.424
1526	Adjusted Chi Square Value					461.8	95% Jackknife UCL					2.43
1527							95% Standard Bootstrap UCL					2.42
1528	Anderson-Darling Test Statistic					0.638	95% Bootstrap-t UCL					2.42
1529	Anderson-Darling 5% Critical Value					0.747	95% Hall's Bootstrap UCL					2.418
1530	Kolmogorov-Smirnov Test Statistic					0.151	95% Percentile Bootstrap UCL					2.413
1531	Kolmogorov-Smirnov 5% Critical Value					0.156	95% BCA Bootstrap UCL					2.416
1532	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					2.762
1533							97.5% Chebyshev(Mean, Sd) UCL					2.996
1534	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					3.457
1535	95% Approximate Gamma UCL					2.467						
1536	95% Adjusted Gamma UCL					2.481						
1537												

1538	**Potential UCL to Use**									Use 95% Student's-t UCL	2.43	
1539												
1540												
1541	**Chromium, dissolved (mw-26)**											
1542												
1543	**General Statistics**											
1544	Number of Valid Observations	37					Number of Distinct Observations	31				
1545												
1546	**Raw Statistics**						**Log-transformed Statistics**					
1547	Minimum	0.76					Minimum of Log Data	-0.274				
1548	Maximum	5.02					Maximum of Log Data	1.613				
1549	Mean	2.92					Mean of log Data	0.985				
1550	Median	3.11					SD of log Data	0.465				
1551	SD	1.045										
1552	Coefficient of Variation	0.358										
1553	Skewness	-0.417										
1554												
1555	**Relevant UCL Statistics**											
1556	**Normal Distribution Test**						**Lognormal Distribution Test**					
1557	Shapiro Wilk Test Statistic	0.93					Shapiro Wilk Test Statistic	0.831				
1558	Shapiro Wilk Critical Value	0.936					Shapiro Wilk Critical Value	0.936				
1559	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1560												
1561	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1562	95% Student's-t UCL	3.21					95% H-UCL	3.452				
1563	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	4.006				
1564	95% Adjusted-CLT UCL	3.19					97.5% Chebyshev (MVUE) UCL	4.452				
1565	95% Modified-t UCL	3.208					99% Chebyshev (MVUE) UCL	5.329				
1566												
1567	**Gamma Distribution Test**						**Data Distribution**					
1568	k star (bias corrected)	5.47					**Data do not follow a Discernable Distribution (0.05)**					
1569	Theta Star	0.534										
1570	nu star	404.8										
1571	Approximate Chi Square Value (.05)	359.2					**Nonparametric Statistics**					
1572	Adjusted Level of Significance	0.0431					95% CLT UCL	3.202				
1573	Adjusted Chi Square Value	357.3					95% Jackknife UCL	3.21				
1574							95% Standard Bootstrap UCL	3.195				
1575	Anderson-Darling Test Statistic	2.065					95% Bootstrap-t UCL	3.192				
1576	Anderson-Darling 5% Critical Value	0.75					95% Hall's Bootstrap UCL	3.199				
1577	Kolmogorov-Smirnov Test Statistic	0.214					95% Percentile Bootstrap UCL	3.192				
1578	Kolmogorov-Smirnov 5% Critical Value	0.145					95% BCA Bootstrap UCL	3.175				
1579	**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	3.668				
1580							97.5% Chebyshev(Mean, Sd) UCL	3.992				
1581	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	4.629				
1582	95% Approximate Gamma UCL	3.291										
1583	95% Adjusted Gamma UCL	3.308										
1584												
1585	**Potential UCL to Use**						Use 95% Student's-t UCL	3.21				
1586							or 95% Modified-t UCL	3.208				
1587												
1588												
1589	**Chromium, dissolved (mw-27-20)**											
1590												

	A	B	C	D	E	F	G	H	I	J	K	L
1591	**General Statistics**											
1592					Number of Valid Data	68				Number of Detected Data		10
1593					Number of Distinct Detected Data	10				Number of Non-Detect Data		58
1594										Percent Non-Detects		85.29%
1595												
1596	**Raw Statistics**						**Log-transformed Statistics**					
1597					Minimum Detected	0.001				Minimum Detected		-6.908
1598					Maximum Detected	0.014				Maximum Detected		-4.269
1599					Mean of Detected	0.00571				Mean of Detected		-5.512
1600					SD of Detected	0.00467				SD of Detected		0.918
1601					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
1602					Maximum Non-Detect	0.02				Maximum Non-Detect		-3.912
1603												
1604	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		68
1605	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1606	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1607												
1608	**UCL Statistics**											
1609	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1610					Lilliefors Test Statistic	0.87				Lilliefors Test Statistic		0.945
1611					5% Lilliefors Critical Value	0.842				5% Lilliefors Critical Value		0.842
1612	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1613												
1614	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1615					DL/2 Substitution Method					DL/2 Substitution Method		
1616					Mean	0.00281				Mean		-6.805
1617					SD	0.00405				SD		1.263
1618					95% DL/2 (t) UCL	0.00362				95% H-Stat (DL/2) UCL		0.004
1619												
1620					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1621	**MLE method failed to converge properly**									Mean in Log Scale		-8.88
1622										SD in Log Scale		2.183
1623										Mean in Original Scale		0.00107
1624										SD in Original Scale		0.00263
1625										95% Percentile Bootstrap UCL		0.00162
1626										95% BCA Bootstrap UCL		0.00172
1627												
1628	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1629					k star (bias corrected)	1.179	**Data appear Normal at 5% Significance Level**					
1630					Theta Star	0.00484						
1631					nu star	23.57						
1632												
1633					A-D Test Statistic	0.327	**Nonparametric Statistics**					
1634					5% A-D Critical Value	0.739				Kaplan-Meier (KM) Method		
1635					K-S Test Statistic	0.739				Mean		0.00183
1636					5% K-S Critical Value	0.271				SD		0.00258
1637	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.00036
1638										95% KM (t) UCL		0.00243
1639	**Assuming Gamma Distribution**									95% KM (z) UCL		0.00242
1640					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.00233
1641					Minimum	1E-09				95% KM (bootstrap t) UCL		0.00268
1642					Maximum	0.0583				95% KM (BCA) UCL		0.00328
1643					Mean	0.0249				95% KM (Percentile Bootstrap) UCL		0.00293

1644					Median	0.0248				95% KM (Chebyshev) UCL		0.0034
1645					SD	0.0166				97.5% KM (Chebyshev) UCL		0.00407
1646					k star	0.925				99% KM (Chebyshev) UCL		0.00541
1647					Theta star	0.0269						
1648					Nu star	125.9				**Potential UCLs to Use**		
1649					AppChi2	100.9				95% KM (t) UCL		0.00243
1650				95% Gamma Approximate UCL		0.031				95% KM (Percentile Bootstrap) UCL		0.00293
1651				95% Adjusted Gamma UCL		0.0311						
1652	**Note: DL/2 is not a recommended method.**											
1653												
1654												
1655	**Chromium, dissolved (mw-27-60)**											
1656												
1657	**General Statistics**											
1658					Number of Valid Data	18				Number of Detected Data		1
1659					Number of Distinct Detected Data	1				Number of Non-Detect Data		17
1660										Percent Non-Detects		94.44%
1661												
1662	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
1663	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
1664												
1665	**The data set for variable Chromium, dissolved (mw-27-60) was not processed!**											
1666												
1667												
1668												
1669	**Chromium, dissolved (mw-27-85)**											
1670												
1671	**General Statistics**											
1672					Number of Valid Data	42				Number of Detected Data		4
1673					Number of Distinct Detected Data	4				Number of Non-Detect Data		38
1674										Percent Non-Detects		90.48%
1675												
1676	**Raw Statistics**						**Log-transformed Statistics**					
1677					Minimum Detected	0.001				Minimum Detected		-6.908
1678					Maximum Detected	0.0066				Maximum Detected		-5.021
1679					Mean of Detected	0.00375				Mean of Detected		-5.791
1680					SD of Detected	0.00236				SD of Detected		0.811
1681					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
1682					Maximum Non-Detect	0.0026				Maximum Non-Detect		-5.952
1683												
1684	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		39
1685	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		3
1686	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		92.86%
1687												
1688	**Warning: There are only 4 Distinct Detected Values in this data**											
1689	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1690	**the resulting calculations may not be reliable enough tp draw conclusions**											
1691												
1692	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1693												
1694												
1695	**UCL Statistics**											
1696	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					

1697					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	0.938
1698					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
1699					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
1700												
1701					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1702					DL/2 Substitution Method						DL/2 Substitution Method	
1703					Mean	0.0008286					Mean	-7.406
1704					SD	0.00116					SD	0.592
1705					95% DL/2 (t) UCL	0.00113					95% H-Stat (DL/2) UCL	0.0007647
1706												
1707					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
1708					Mean	0.00512					Mean in Log Scale	-10.13
1709					SD	0.00148					SD in Log Scale	2.386
1710					95% MLE (t) UCL	0.00551					Mean in Original Scale	0.0004517
1711					95% MLE (Tiku) UCL	0.00654					SD in Original Scale	0.00127
1712											95% Percentile Bootstrap UCL	0.0007861
1713											95% BCA Bootstrap UCL	0.0009248
1714												
1715					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
1716					k star (bias corrected)	0.815					**Data appear Normal at 5% Significance Level**	
1717					Theta Star	0.0046						
1718					nu star	6.522						
1719												
1720					A-D Test Statistic	0.239					**Nonparametric Statistics**	
1721					5% A-D Critical Value	0.66					Kaplan-Meier (KM) Method	
1722					K-S Test Statistic	0.66					Mean	0.00126
1723					5% K-S Critical Value	0.397					SD	0.00102
1724					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0001825
1725											95% KM (t) UCL	0.00157
1726					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00156
1727					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00252
1728					Minimum	0.001					95% KM (bootstrap t) UCL	0.00149
1729					Maximum	0.102					95% KM (BCA) UCL	0.0066
1730					Mean	0.0431					95% KM (Percentile Bootstrap) UCL	0.00456
1731					Median	0.0407					95% KM (Chebyshev) UCL	0.00206
1732					SD	0.0318					97.5% KM (Chebyshev) UCL	0.0024
1733					k star	1.08					99% KM (Chebyshev) UCL	0.00308
1734					Theta star	0.0399						
1735					Nu star	90.7					**Potential UCLs to Use**	
1736					AppChi2	69.74					95% KM (t) UCL	0.00157
1737					95% Gamma Approximate UCL	0.056					95% KM (Percentile Bootstrap) UCL	0.00456
1738					95% Adjusted Gamma UCL	N/A						
1739	**Note: DL/2 is not a recommended method.**											
1740												
1741												
1742	**Chromium, dissolved (mw-28-25)**											
1743												
1744							**General Statistics**					
1745					Number of Valid Data	68					Number of Detected Data	11
1746					Number of Distinct Detected Data	11					Number of Non-Detect Data	57
1747											Percent Non-Detects	83.82%
1748												
1749					**Raw Statistics**						**Log-transformed Statistics**	

1750					Minimum Detected	0.0012					Minimum Detected	-6.725
1751					Maximum Detected	0.0121					Maximum Detected	-4.415
1752					Mean of Detected	0.00458					Mean of Detected	-5.668
1753					SD of Detected	0.0039					SD of Detected	0.769
1754					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
1755					Maximum Non-Detect	0.8					Maximum Non-Detect	-0.223
1756												
1757	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	68
1758	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1759	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1760												
1761	**UCL Statistics**											
1762	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1763					Lilliefors Test Statistic	0.758					Lilliefors Test Statistic	0.93
1764					5% Lilliefors Critical Value	0.85					5% Lilliefors Critical Value	0.85
1765	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1766												
1767	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1768					DL/2 Substitution Method						DL/2 Substitution Method	
1769					Mean	0.00844					Mean	-6.733
1770					SD	0.0483					SD	1.397
1771					95% DL/2 (t) UCL	0.0182					95% H-Stat (DL/2) UCL	0.00412
1772												
1773					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1774	**MLE method failed to converge properly**										Mean in Log Scale	-8.304
1775											SD in Log Scale	1.752
1776											Mean in Original Scale	0.00102
1777											SD in Original Scale	0.00223
1778											95% Percentile Bootstrap UCL	0.00149
1779											95% BCA Bootstrap UCL	0.00163
1780												
1781	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1782					k star (bias corrected)	1.456	**Data appear Gamma Distributed at 5% Significance Level**					
1783					Theta Star	0.00315						
1784					nu star	32.04						
1785												
1786					A-D Test Statistic	0.546	**Nonparametric Statistics**					
1787					5% A-D Critical Value	0.739	Kaplan-Meier (KM) Method					
1788					K-S Test Statistic	0.739					Mean	0.00185
1789					5% K-S Critical Value	0.259					SD	0.00211
1790	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0002931
1791											95% KM (t) UCL	0.00234
1792	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00233
1793					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00224
1794					Minimum	1E-09					95% KM (bootstrap t) UCL	0.00278
1795					Maximum	0.032					95% KM (BCA) UCL	0.00315
1796					Mean	0.0147					95% KM (Percentile Bootstrap) UCL	0.00278
1797					Median	0.015					95% KM (Chebyshev) UCL	0.00313
1798					SD	0.00894					97.5% KM (Chebyshev) UCL	0.00368
1799					k star	1.061					99% KM (Chebyshev) UCL	0.00477
1800					Theta star	0.0138						
1801					Nu star	144.3	**Potential UCLs to Use**					
1802					AppChi2	117.5					95% KM (t) UCL	0.00234

1803				95% Gamma Approximate UCL		0.018						
1804				95% Adjusted Gamma UCL		0.0181						
1805	**Note: DL/2 is not a recommended method.**											
1806												
1807												
1808	**Chromium, dissolved (mw-28-90)**											
1809												
1810					**General Statistics**							
1811				Number of Valid Data		46			Number of Detected Data		5	
1812				Number of Distinct Detected Data		4			Number of Non-Detect Data		41	
1813									Percent Non-Detects		89.13%	
1814												
1815				**Raw Statistics**					**Log-transformed Statistics**			
1816				Minimum Detected		0.0011			Minimum Detected		-6.812	
1817				Maximum Detected		0.0051			Maximum Detected		-5.279	
1818				Mean of Detected		0.00236			Mean of Detected		-6.22	
1819				SD of Detected		0.00164			SD of Detected		0.638	
1820				Minimum Non-Detect		0.001			Minimum Non-Detect		-6.908	
1821				Maximum Non-Detect		0.001			Maximum Non-Detect		-6.908	
1822												
1823												
1824					**Warning: There are only 4 Distinct Detected Values in this data**							
1825					**Note: It should be noted that even though bootstrap may be performed on this data set**							
1826					**the resulting calculations may not be reliable enough tp draw conclusions**							
1827												
1828					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
1829												
1830												
1831					**UCL Statistics**							
1832				**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**			
1833				Shapiro Wilk Test Statistic		0.822			Shapiro Wilk Test Statistic		0.897	
1834				5% Shapiro Wilk Critical Value		0.762			5% Shapiro Wilk Critical Value		0.762	
1835				**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**			
1836												
1837				**Assuming Normal Distribution**					**Assuming Lognormal Distribution**			
1838				DL/2 Substitution Method					DL/2 Substitution Method			
1839				Mean		0.0007022			Mean		-7.451	
1840				SD		0.0007626			SD		0.474	
1841				95% DL/2 (t) UCL		0.000891			95% H-Stat (DL/2) UCL		0.0006776	
1842												
1843				Maximum Likelihood Estimate(MLE) Method		N/A			Log ROS Method			
1844				**MLE yields a negative mean**					Mean in Log Scale		-9.673	
1845									SD in Log Scale		1.991	
1846									Mean in Original Scale		0.0003589	
1847									SD in Original Scale		0.0008717	
1848									95% Percentile Bootstrap UCL		0.0005987	
1849									95% BCA Bootstrap UCL		0.0006843	
1850												
1851				**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**			
1852				k star (bias corrected)		1.364			**Data appear Normal at 5% Significance Level**			
1853				Theta Star		0.00173						
1854				nu star		13.64						
1855												

1856				A-D Test Statistic	0.396		**Nonparametric Statistics**					
1857				5% A-D Critical Value	0.683					Kaplan-Meier (KM) Method		
1858				K-S Test Statistic	0.683					Mean		0.00124
1859				5% K-S Critical Value	0.359					SD		0.0006225
1860	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.0001026
1861										95% KM (t) UCL		0.00141
1862	**Assuming Gamma Distribution**									95% KM (z) UCL		0.00141
1863	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL		0.00139
1864				Minimum	0.0004527					95% KM (bootstrap t) UCL		0.00158
1865				Maximum	0.0239					95% KM (BCA) UCL		0.0024
1866				Mean	0.0123					95% KM (Percentile Bootstrap) UCL		0.00224
1867				Median	0.0126					95% KM (Chebyshev) UCL		0.00168
1868				SD	0.00729					97.5% KM (Chebyshev) UCL		0.00188
1869				k star	1.661					99% KM (Chebyshev) UCL		0.00226
1870				Theta star	0.00739							
1871				Nu star	152.8		**Potential UCLs to Use**					
1872				AppChi2	125.3					95% KM (t) UCL		0.00141
1873				95% Gamma Approximate UCL	0.015					95% KM (Percentile Bootstrap) UCL		0.00224
1874				95% Adjusted Gamma UCL	0.0151							
1875	**Note: DL/2 is not a recommended method.**											
1876												
1877												
1878	**Chromium, dissolved (mw-29)**											
1879												
1880	**General Statistics**											
1881				Number of Valid Data	43					Number of Detected Data		8
1882				Number of Distinct Detected Data	8					Number of Non-Detect Data		35
1883										Percent Non-Detects		81.40%
1884												
1885	**Raw Statistics**						**Log-transformed Statistics**					
1886				Minimum Detected	0.0029					Minimum Detected		-5.843
1887				Maximum Detected	0.0193					Maximum Detected		-3.948
1888				Mean of Detected	0.00708					Mean of Detected		-5.207
1889				SD of Detected	0.00595					SD of Detected		0.727
1890				Minimum Non-Detect	0.001					Minimum Non-Detect		-6.908
1891				Maximum Non-Detect	0.8					Maximum Non-Detect		-0.223
1892												
1893	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		43
1894	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1895	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1896												
1897	**Warning: There are only 8 Detected Values in this data**											
1898	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1899	**the resulting calculations may not be reliable enough tp draw conclusions**											
1900												
1901	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1902												
1903												
1904	**UCL Statistics**											
1905	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1906				Shapiro Wilk Test Statistic	0.767					Shapiro Wilk Test Statistic		0.846
1907				5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value		0.818
1908	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					

1909												
1910	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1911				DL/2 Substitution Method						DL/2 Substitution Method		
1912				Mean	0.0135					Mean		-6.22
1913				SD	0.0605					SD		1.628
1914				95% DL/2 (t) UCL	0.029					95% H-Stat (DL/2) UCL		0.0135
1915												
1916				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1917	**MLE method failed to converge properly**									Mean in Log Scale		-7.376
1918										SD in Log Scale		1.602
1919										Mean in Original Scale		0.002
1920										SD in Original Scale		0.00367
1921										95% Percentile Bootstrap UCL		0.00295
1922										95% BCA Bootstrap UCL		0.0032
1923												
1924	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1925				k star (bias corrected)	1.398		**Data appear Gamma Distributed at 5% Significance Level**					
1926				Theta Star	0.00506							
1927				nu star	22.36							
1928												
1929				A-D Test Statistic	0.689		**Nonparametric Statistics**					
1930				5% A-D Critical Value	0.724					Kaplan-Meier (KM) Method		
1931				K-S Test Statistic	0.724					Mean		0.00398
1932				5% K-S Critical Value	0.297					SD		0.00337
1933	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.0006462
1934										95% KM (t) UCL		0.00506
1935	**Assuming Gamma Distribution**									95% KM (z) UCL		0.00504
1936				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00496
1937				Minimum	1E-09					95% KM (bootstrap t) UCL		0.00731
1938				Maximum	0.0418					95% KM (BCA) UCL		0.00562
1939				Mean	0.018					95% KM (Percentile Bootstrap) UCL		0.00526
1940				Median	0.0185					95% KM (Chebyshev) UCL		0.00679
1941				SD	0.0114					97.5% KM (Chebyshev) UCL		0.00801
1942				k star	0.875					99% KM (Chebyshev) UCL		0.0104
1943				Theta star	0.0205							
1944				Nu star	75.29		**Potential UCLs to Use**					
1945				AppChi2	56.3					95% KM (t) UCL		0.00506
1946				95% Gamma Approximate UCL	0.024							
1947				95% Adjusted Gamma UCL	0.0243							
1948	**Note: DL/2 is not a recommended method.**											
1949												
1950												
1951	**Chromium, dissolved (mw-3)**											
1952												
1953	**General Statistics**											
1954				Number of Valid Data	9					Number of Detected Data		8
1955				Number of Distinct Detected Data	8					Number of Non-Detect Data		1
1956										Percent Non-Detects		11.11%
1957												
1958	**Raw Statistics**						**Log-transformed Statistics**					
1959				Minimum Detected	0.0099		Log Statistics Not Avaliable					
1960				Maximum Detected	1.2							
1961				Mean of Detected	0.184							

Mean of Detected	0.184	
Mean of Detected	0.184	
Maximum Non-Detect	0	

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.502	Not Available	
5% Shapiro Wilk Critical Value	0.818		
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	N/A
Mean	0.164		
SD	0.393		
95% DL/2 (t) UCL	0.408		
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	N/A
Mean	0.133		
SD	0.4		
95% MLE (t) UCL	0.381		
95% MLE (Tiku) UCL	0.364		
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
Gamma Statistics Not Available		Data do not follow a Discernable Distribution (0.05)	
Potential UCLs to Use		**Nonparametric Statistics**	
99% KM (Chebyshev) UCL	1.477	Kaplan-Meier (KM) Method	
		Mean	0.165
		SD	0.37
		SE of Mean	0.132
		95% KM (t) UCL	0.41
		95% KM (z) UCL	0.382
		95% KM (jackknife) UCL	0.408
		95% KM (bootstrap t) UCL	17.81
		95% KM (BCA) UCL	0.429
		95% KM (Percentile Bootstrap) UCL	0.41
		95% KM (Chebyshev) UCL	0.74
		97.5% KM (Chebyshev) UCL	0.989
		99% KM (Chebyshev) UCL	1.477

Warning: Recommended UCL exceeds the maximum observation

Note: DL/2 is not a recommended method.

Chromium, dissolved (mw-30-30)

	A	B	C	D	E	F	G	H	I	J	K	L
2015	**General Statistics**											
2016					Number of Valid Data	66				Number of Detected Data		17
2017					Number of Distinct Detected Data	14				Number of Non-Detect Data		49
2018										Percent Non-Detects		74.24%
2019												
2020	**Raw Statistics**						**Log-transformed Statistics**					
2021					Minimum Detected	0.0011				Minimum Detected		-6.812
2022					Maximum Detected	0.4				Maximum Detected		-0.916
2023					Mean of Detected	0.0274				Mean of Detected		-5.651
2024					SD of Detected	0.0962				SD of Detected		1.458
2025					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
2026					Maximum Non-Detect	0.8				Maximum Non-Detect		-0.223
2027												
2028	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		66
2029	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
2030	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
2031												
2032	**UCL Statistics**											
2033	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2034					Lilliefors Test Statistic	0.296				Lilliefors Test Statistic		0.711
2035					5% Lilliefors Critical Value	0.892				5% Lilliefors Critical Value		0.892
2036	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2037												
2038	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2039					DL/2 Substitution Method					DL/2 Substitution Method		
2040					Mean	0.0148				Mean		-6.562
2041					SD	0.0688				SD		1.539
2042					95% DL/2 (t) UCL	0.0289				95% H-Stat (DL/2) UCL		0.00635
2043												
2044					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
2045	**MLE method failed to converge properly**									Mean in Log Scale		-8.641
2046										SD in Log Scale		2.425
2047										Mean in Original Scale		0.00722
2048										SD in Original Scale		0.0492
2049										95% Percentile Bootstrap UCL		0.0193
2050										95% BCA Bootstrap UCL		0.0257
2051												
2052	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2053					k star (bias corrected)	0.311	**Data do not follow a Discernable Distribution (0.05)**					
2054					Theta Star	0.088						
2055					nu star	10.59						
2056												
2057					A-D Test Statistic	3.739	**Nonparametric Statistics**					
2058					5% A-D Critical Value	0.835				Kaplan-Meier (KM) Method		
2059					K-S Test Statistic	0.835				Mean		0.00804
2060					5% K-S Critical Value	0.226				SD		0.0491
2061	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.00628
2062										95% KM (t) UCL		0.0185
2063	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0184
2064					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.0183
2065					Minimum	1E-09				95% KM (bootstrap t) UCL		0.315
2066					Maximum	4.474				95% KM (BCA) UCL		0.0206
2067					Mean	0.468				95% KM (Percentile Bootstrap) UCL		0.0202

2068					Median	0.106				95% KM (Chebyshev) UCL		0.0354
2069					SD	0.797				97.5% KM (Chebyshev) UCL		0.0472
2070					k star	0.18				99% KM (Chebyshev) UCL		0.0705
2071					Theta star	2.601						
2072					Nu star	23.73				**Potential UCLs to Use**		
2073					AppChi2	13.65				95% KM (BCA) UCL		0.0206
2074					95% Gamma Approximate UCL	0.813						
2075					95% Adjusted Gamma UCL	0.824						
2076	**Note: DL/2 is not a recommended method.**											
2077												
2078												
2079	**Chromium, dissolved (mw-30-50)**											
2080												
2081						**General Statistics**						
2082					Number of Valid Data	51				Number of Detected Data		39
2083					Number of Distinct Detected Data	37				Number of Non-Detect Data		12
2084										Percent Non-Detects		23.53%
2085												
2086					**Raw Statistics**					**Log-transformed Statistics**		
2087					Minimum Detected	0.0028				Minimum Detected		-5.878
2088					Maximum Detected	3.34				Maximum Detected		1.206
2089					Mean of Detected	1.254				Mean of Detected		-0.597
2090					SD of Detected	0.909				SD of Detected		1.976
2091					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
2092					Maximum Non-Detect	0.001				Maximum Non-Detect		-6.908
2093												
2094												
2095						**UCL Statistics**						
2096					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
2097					Lilliefors Test Statistic	0.931				Lilliefors Test Statistic		0.74
2098					5% Lilliefors Critical Value	0.939				5% Lilliefors Critical Value		0.939
2099					**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**		
2100												
2101					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
2102					DL/2 Substitution Method					DL/2 Substitution Method		
2103					Mean	0.959				Mean		-2.245
2104					SD	0.957				SD		3.46
2105					95% DL/2 (t) UCL	1.184				95% H-Stat (DL/2) UCL		474.6
2106												
2107					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
2108					Mean	0.795				Mean in Log Scale		-1.458
2109					SD	1.175				SD in Log Scale		2.366
2110					95% MLE (t) UCL	1.07				Mean in Original Scale		0.964
2111					95% MLE (Tiku) UCL	1.08				SD in Original Scale		0.953
2112										95% Percentile Bootstrap UCL		1.176
2113										95% BCA Bootstrap UCL		1.205
2114												
2115					**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**		
2116					k star (bias corrected)	0.69				**Data do not follow a Discernable Distribution (0.05)**		
2117					Theta Star	1.817						
2118					nu star	53.85						
2119												
2120					A-D Test Statistic	2.763				**Nonparametric Statistics**		

2121				5% A-D Critical Value	0.791					Kaplan-Meier (KM) Method		
2122				K-S Test Statistic	0.791					Mean		0.96
2123				5% K-S Critical Value	0.147					SD		0.947
2124				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.134
2125										95% KM (t) UCL		1.185
2126				**Assuming Gamma Distribution**						95% KM (z) UCL		1.181
2127				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1.184
2128				Minimum	0.0028					95% KM (bootstrap t) UCL		1.198
2129				Maximum	3.34					95% KM (BCA) UCL		1.185
2130				Mean	1.022					95% KM (Percentile Bootstrap) UCL		1.192
2131				Median	0.79					95% KM (Chebyshev) UCL		1.546
2132				SD	0.902					97.5% KM (Chebyshev) UCL		1.799
2133				k star	0.692					99% KM (Chebyshev) UCL		2.297
2134				Theta star	1.477							
2135				Nu star	70.56					**Potential UCLs to Use**		
2136				AppChi2	52.22					97.5% KM (Chebyshev) UCL		1.799
2137				95% Gamma Approximate UCL	1.38							
2138				95% Adjusted Gamma UCL	1.393							
2139	**Note: DL/2 is not a recommended method.**											
2140												
2141												
2142	**Chromium, dissolved (mw-31-135)**											
2143												
2144					**General Statistics**							
2145				Number of Valid Observations	14					Number of Distinct Observations		14
2146												
2147				**Raw Statistics**						**Log-transformed Statistics**		
2148				Minimum	0.0294					Minimum of Log Data		-3.527
2149				Maximum	0.407					Maximum of Log Data		-0.899
2150				Mean	0.218					Mean of log Data		-1.795
2151				Median	0.222					SD of log Data		0.866
2152				SD	0.135							
2153				Coefficient of Variation	0.62							
2154				Skewness	0.0705							
2155												
2156					**Relevant UCL Statistics**							
2157				**Normal Distribution Test**						**Lognormal Distribution Test**		
2158				Shapiro Wilk Test Statistic	0.92					Shapiro Wilk Test Statistic		0.882
2159				Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value		0.874
2160				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
2161												
2162				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
2163				95% Student's-t UCL	0.282					95% H-UCL		0.449
2164				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL		0.486
2165				95% Adjusted-CLT UCL	0.278					97.5% Chebyshev (MVUE) UCL		0.595
2166				95% Modified-t UCL	0.282					99% Chebyshev (MVUE) UCL		0.809
2167												
2168				**Gamma Distribution Test**						**Data Distribution**		
2169				k star (bias corrected)	1.611					**Data appear Normal at 5% Significance Level**		
2170				Theta Star	0.135							
2171				nu star	45.12							
2172				Approximate Chi Square Value (.05)	30.71					**Nonparametric Statistics**		
2173				Adjusted Level of Significance	0.0312					95% CLT UCL		0.277

2174					Adjusted Chi Square Value	29.14					95% Jackknife UCL	0.282
2175											95% Standard Bootstrap UCL	0.276
2176					Anderson-Darling Test Statistic	0.503					95% Bootstrap-t UCL	0.281
2177					Anderson-Darling 5% Critical Value	0.746					95% Hall's Bootstrap UCL	0.274
2178					Kolmogorov-Smirnov Test Statistic	0.159					95% Percentile Bootstrap UCL	0.275
2179					Kolmogorov-Smirnov 5% Critical Value	0.232					95% BCA Bootstrap UCL	0.273
2180					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.375
2181											97.5% Chebyshev(Mean, Sd) UCL	0.444
2182					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.577
2183					95% Approximate Gamma UCL	0.32						
2184					95% Adjusted Gamma UCL	0.338						
2185												
2186					**Potential UCL to Use**						Use 95% Student's-t UCL	0.282
2187												
2188												
2189	**Chromium, dissolved (mw-31-60)**											
2190												
2191					**General Statistics**							
2192					Number of Valid Observations	35					Number of Distinct Observations	28
2193												
2194					**Raw Statistics**						**Log-transformed Statistics**	
2195					Minimum	0.638					Minimum of Log Data	-0.449
2196					Maximum	5.62					Maximum of Log Data	1.726
2197					Mean	3.038					Mean of log Data	0.981
2198					Median	3.4					SD of log Data	0.584
2199					SD	1.271						
2200					Coefficient of Variation	0.418						
2201					Skewness	-0.441						
2202												
2203					**Relevant UCL Statistics**							
2204					**Normal Distribution Test**						**Lognormal Distribution Test**	
2205					Shapiro Wilk Test Statistic	0.909					Shapiro Wilk Test Statistic	0.805
2206					Shapiro Wilk Critical Value	0.934					Shapiro Wilk Critical Value	0.934
2207					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
2208												
2209					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2210					95% Student's-t UCL	3.401					95% H-UCL	3.858
2211					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	4.584
2212					95% Adjusted-CLT UCL	3.374					97.5% Chebyshev (MVUE) UCL	5.207
2213					95% Modified-t UCL	3.399					99% Chebyshev (MVUE) UCL	6.429
2214												
2215					**Gamma Distribution Test**						**Data Distribution**	
2216					k star (bias corrected)	3.681					**Data do not follow a Discernable Distribution (0.05)**	
2217					Theta Star	0.825						
2218					nu star	257.7						
2219					Approximate Chi Square Value (.05)	221.5					**Nonparametric Statistics**	
2220					Adjusted Level of Significance	0.0425					95% CLT UCL	3.392
2221					Adjusted Chi Square Value	219.9					95% Jackknife UCL	3.401
2222											95% Standard Bootstrap UCL	3.383
2223					Anderson-Darling Test Statistic	2.464					95% Bootstrap-t UCL	3.384
2224					Anderson-Darling 5% Critical Value	0.753					95% Hall's Bootstrap UCL	3.376
2225					Kolmogorov-Smirnov Test Statistic	0.26					95% Percentile Bootstrap UCL	3.385
2226					Kolmogorov-Smirnov 5% Critical Value	0.149					95% BCA Bootstrap UCL	3.37

2227	Data not Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		3.975
2228										97.5% Chebyshev(Mean, Sd) UCL		4.38
2229	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		5.176
2230					95% Approximate Gamma UCL	3.534						
2231					95% Adjusted Gamma UCL	3.56						
2232												
2233	Potential UCL to Use									Use 95% Chebyshev (Mean, Sd) UCL		3.975
2234												
2235												
2236	Chromium, dissolved (mw-32-20)											
2237												
2238	General Statistics											
2239					Number of Valid Data	34				Number of Detected Data		4
2240					Number of Distinct Detected Data	4				Number of Non-Detect Data		30
2241										Percent Non-Detects		88.24%
2242												
2243	Raw Statistics									Log-transformed Statistics		
2244					Minimum Detected	0.0031				Minimum Detected		-5.776
2245					Maximum Detected	0.013				Maximum Detected		-4.343
2246					Mean of Detected	0.00835				Mean of Detected		-4.934
2247					SD of Detected	0.00468				SD of Detected		0.665
2248					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
2249					Maximum Non-Detect	0.0019				Maximum Non-Detect		-6.266
2250												
2251	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		30
2252	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		4
2253	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		88.24%
2254												
2255	Warning: There are only 4 Distinct Detected Values in this data											
2256	Note: It should be noted that even though bootstrap may be performed on this data set											
2257	the resulting calculations may not be reliable enough tp draw conclusions											
2258												
2259	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
2260												
2261												
2262	UCL Statistics											
2263	Normal Distribution Test with Detected Values Only									Lognormal Distribution Test with Detected Values Only		
2264					Shapiro Wilk Test Statistic	0.918				Shapiro Wilk Test Statistic		0.913
2265					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value		0.748
2266	Data appear Normal at 5% Significance Level									Data appear Lognormal at 5% Significance Level		
2267												
2268	Assuming Normal Distribution									Assuming Lognormal Distribution		
2269					DL/2 Substitution Method					DL/2 Substitution Method		
2270					Mean	0.00144				Mean		-7.268
2271					SD	0.00293				SD		0.895
2272					95% DL/2 (t) UCL	0.00229				95% H-Stat (DL/2) UCL		0.00113
2273												
2274					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
2275					Mean	0.00921				Mean in Log Scale		-8.317
2276					SD	0.00405				SD in Log Scale		1.968
2277					95% MLE (t) UCL	0.0104				Mean in Original Scale		0.00134
2278					95% MLE (Tiku) UCL	0.0126				SD in Original Scale		0.003
2279										95% Percentile Bootstrap UCL		0.00227

2280											95% BCA Bootstrap UCL	0.00243
2281												
2282	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2283					k star (bias corrected)	1.05	**Data appear Normal at 5% Significance Level**					
2284					Theta Star	0.00795						
2285					nu star	8.4						
2286												
2287					A-D Test Statistic	0.337	**Nonparametric Statistics**					
2288					5% A-D Critical Value	0.659	Kaplan-Meier (KM) Method					
2289					K-S Test Statistic	0.659					Mean	0.00372
2290					5% K-S Critical Value	0.396					SD	0.00219
2291	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0004335
2292											95% KM (t) UCL	0.00445
2293	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00443
2294					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00545
2295					Minimum	0.003					95% KM (bootstrap t) UCL	0.00416
2296					Maximum	0.096					95% KM (BCA) UCL	0.0116
2297					Mean	0.0452					95% KM (Percentile Bootstrap) UCL	0.0116
2298					Median	0.0455					95% KM (Chebyshev) UCL	0.00561
2299					SD	0.0293					97.5% KM (Chebyshev) UCL	0.00642
2300					k star	1.5					99% KM (Chebyshev) UCL	0.00803
2301					Theta star	0.0302						
2302					Nu star	102	**Potential UCLs to Use**					
2303					AppChi2	79.67					95% KM (t) UCL	0.00445
2304					95% Gamma Approximate UCL	0.0579					95% KM (Percentile Bootstrap) UCL	0.0116
2305					95% Adjusted Gamma UCL	N/A						
2306	**Note: DL/2 is not a recommended method.**											
2307												
2308												
2309	**Chromium, dissolved (mw-32-35)**											
2310												
2311	**General Statistics**											
2312					Number of Valid Data	37					Number of Detected Data	8
2313					Number of Distinct Detected Data	8					Number of Non-Detect Data	29
2314											Percent Non-Detects	78.38%
2315												
2316	**Raw Statistics**						**Log-transformed Statistics**					
2317					Minimum Detected	0.0012					Minimum Detected	-6.725
2318					Maximum Detected	0.0135					Maximum Detected	-4.305
2319					Mean of Detected	0.00631					Mean of Detected	-5.515
2320					SD of Detected	0.00584					SD of Detected	1.038
2321					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
2322					Maximum Non-Detect	0.002					Maximum Non-Detect	-6.215
2323												
2324	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	32
2325	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	5
2326	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	86.49%
2327												
2328	**Warning: There are only 8 Detected Values in this data**											
2329	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2330	**the resulting calculations may not be reliable enough tp draw conclusions**											
2331												
2332	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											

2333												
2334												
2335	**UCL Statistics**											
2336	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2337				Shapiro Wilk Test Statistic	0.727					Shapiro Wilk Test Statistic	0.82	
2338				5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818	
2339	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2340												
2341	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2342				DL/2 Substitution Method						DL/2 Substitution Method		
2343				Mean	0.00178					Mean	-7.12	
2344				SD	0.00353					SD	0.978	
2345				95% DL/2 (t) UCL	0.00276					95% H-Stat (DL/2) UCL	0.00136	
2346												
2347				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2348	**MLE yields a negative mean**									Mean in Log Scale	-8.643	
2349										SD in Log Scale	2.237	
2350										Mean in Original Scale	0.00151	
2351										SD in Original Scale	0.00363	
2352										95% Percentile Bootstrap UCL	0.00253	
2353										95% BCA Bootstrap UCL	0.00292	
2354												
2355	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2356				k star (bias corrected)	0.867		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
2357				Theta Star	0.00728							
2358				nu star	13.87							
2359												
2360				A-D Test Statistic	0.868		**Nonparametric Statistics**					
2361				5% A-D Critical Value	0.732					Kaplan-Meier (KM) Method		
2362				K-S Test Statistic	0.732					Mean	0.00231	
2363				5% K-S Critical Value	0.3					SD	0.0033	
2364	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean	0.0005795	
2365										95% KM (t) UCL	0.00328	
2366	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00326	
2367				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00308	
2368				Minimum	1E-09					95% KM (bootstrap t) UCL	0.00347	
2369				Maximum	0.0651					95% KM (BCA) UCL	0.00421	
2370				Mean	0.0251					95% KM (Percentile Bootstrap) UCL	0.00361	
2371				Median	0.0215					95% KM (Chebyshev) UCL	0.00483	
2372				SD	0.0202					97.5% KM (Chebyshev) UCL	0.00593	
2373				k star	0.622					99% KM (Chebyshev) UCL	0.00807	
2374				Theta star	0.0404							
2375				Nu star	46		**Potential UCLs to Use**					
2376				AppChi2	31.44					95% KM (t) UCL	0.00328	
2377				95% Gamma Approximate UCL	0.0367							
2378				95% Adjusted Gamma UCL	0.0374							
2379	**Note: DL/2 is not a recommended method.**											
2380												
2381												
2382	**Chromium, dissolved (mw-33-150)**											
2383												
2384	**General Statistics**											
2385				Number of Valid Data	24					Number of Detected Data	22	

2386					Number of Distinct Detected Data	19					Number of Non-Detect Data	2
2387											Percent Non-Detects	8.33%
2388												
2389					**Raw Statistics**						**Log-transformed Statistics**	
2390					Minimum Detected	0.0028					Minimum Detected	-5.878
2391					Maximum Detected	0.0098					Maximum Detected	-4.625
2392					Mean of Detected	0.0059					Mean of Detected	-5.184
2393					SD of Detected	0.00185					SD of Detected	0.333
2394					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
2395					Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908
2396												
2397												
2398					**UCL Statistics**							
2399					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
2400					Shapiro Wilk Test Statistic	0.964					Shapiro Wilk Test Statistic	0.95
2401					5% Shapiro Wilk Critical Value	0.911					5% Shapiro Wilk Critical Value	0.911
2402					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
2403												
2404					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2405					DL/2 Substitution Method						DL/2 Substitution Method	
2406					Mean	0.00545					Mean	-5.385
2407					SD	0.00233					SD	0.753
2408					95% DL/2 (t) UCL	0.00626					95% H-Stat (DL/2) UCL	0.00862
2409												
2410					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2411					Mean	0.00541					Mean in Log Scale	-5.248
2412					SD	0.00237					SD in Log Scale	0.386
2413					95% MLE (t) UCL	0.00624					Mean in Original Scale	0.00562
2414					95% MLE (Tiku) UCL	0.00627					SD in Original Scale	0.00199
2415											95% Percentile Bootstrap UCL	0.00627
2416											95% BCA Bootstrap UCL	0.00627
2417												
2418					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
2419					k star (bias corrected)	8.79					**Data appear Normal at 5% Significance Level**	
2420					Theta Star	0.0006707						
2421					nu star	386.8						
2422												
2423					A-D Test Statistic	0.335					**Nonparametric Statistics**	
2424					5% A-D Critical Value	0.744					Kaplan-Meier (KM) Method	
2425					K-S Test Statistic	0.744					Mean	0.00564
2426					5% K-S Critical Value	0.185					SD	0.00193
2427					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0004027
2428											95% KM (t) UCL	0.00633
2429					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0063
2430					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00632
2431					Minimum	0.00168					95% KM (bootstrap t) UCL	0.00637
2432					Maximum	0.0098					95% KM (BCA) UCL	0.00629
2433					Mean	0.00558					95% KM (Percentile Bootstrap) UCL	0.00629
2434					Median	0.00565					95% KM (Chebyshev) UCL	0.00739
2435					SD	0.00206					97.5% KM (Chebyshev) UCL	0.00815
2436					k star	5.771					99% KM (Chebyshev) UCL	0.00964
2437					Theta star	0.0009672						
2438					Nu star	277					**Potential UCLs to Use**	

2439					AppChi2	239.5					95% KM (t) UCL	0.00633
2440					95% Gamma Approximate UCL	0.00646					95% KM (Percentile Bootstrap) UCL	0.00629
2441					95% Adjusted Gamma UCL	0.00652						
2442	**Note: DL/2 is not a recommended method.**											
2443												
2444												
2445	**Chromium, dissolved (mw-33-210)**											
2446												
2447	**General Statistics**											
2448					Number of Valid Data	24					Number of Detected Data	21
2449					Number of Distinct Detected Data	19					Number of Non-Detect Data	3
2450											Percent Non-Detects	12.50%
2451												
2452	**Raw Statistics**						**Log-transformed Statistics**					
2453					Minimum Detected	0.0017					Minimum Detected	-6.377
2454					Maximum Detected	0.0115					Maximum Detected	-4.465
2455					Mean of Detected	0.00733					Mean of Detected	-5.003
2456					SD of Detected	0.00273					SD of Detected	0.474
2457					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
2458					Maximum Non-Detect	0.0021					Maximum Non-Detect	-6.166
2459												
2460	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	4
2461	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	20
2462	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	16.67%
2463												
2464	**UCL Statistics**											
2465	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2466					Shapiro Wilk Test Statistic	0.976					Shapiro Wilk Test Statistic	0.886
2467					5% Shapiro Wilk Critical Value	0.908					5% Shapiro Wilk Critical Value	0.908
2468	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2469												
2470	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2471					DL/2 Substitution Method						DL/2 Substitution Method	
2472					Mean	0.0065					Mean	-5.297
2473					SD	0.0034					SD	0.917
2474					95% DL/2 (t) UCL	0.00769					95% H-Stat (DL/2) UCL	0.0113
2475												
2476					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2477					Mean	0.00641					Mean in Log Scale	-5.127
2478					SD	0.00353					SD in Log Scale	0.555
2479					95% MLE (t) UCL	0.00765					Mean in Original Scale	0.00673
2480					95% MLE (Tiku) UCL	0.0077					SD in Original Scale	0.00302
2481											95% Percentile Bootstrap UCL	0.00772
2482											95% BCA Bootstrap UCL	0.0078
2483												
2484	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2485					k star (bias corrected)	5.021	**Data appear Normal at 5% Significance Level**					
2486					Theta Star	0.00146						
2487					nu star	210.9						
2488												
2489					A-D Test Statistic	0.406	**Nonparametric Statistics**					
2490					5% A-D Critical Value	0.745	Kaplan-Meier (KM) Method					
2491					K-S Test Statistic	0.745					Mean	0.00663

2492				5% K-S Critical Value	0.19						SD	0.00311
2493	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.000651
2494											95% KM (t) UCL	0.00775
2495	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0077
2496	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0077
2497				Minimum	0.00149						95% KM (bootstrap t) UCL	0.00766
2498				Maximum	0.0115						95% KM (BCA) UCL	0.00795
2499				Mean	0.00673						95% KM (Percentile Bootstrap) UCL	0.00777
2500				Median	0.00695						95% KM (Chebyshev) UCL	0.00947
2501				SD	0.00304						97.5% KM (Chebyshev) UCL	0.0107
2502				k star	3.468						99% KM (Chebyshev) UCL	0.0131
2503				Theta star	0.00194							
2504				Nu star	166.4		**Potential UCLs to Use**					
2505				AppChi2	137.6						95% KM (t) UCL	0.00775
2506				95% Gamma Approximate UCL	0.00814						95% KM (Percentile Bootstrap) UCL	0.00777
2507				95% Adjusted Gamma UCL	0.00825							
2508	**Note: DL/2 is not a recommended method.**											
2509												
2510												
2511	**Chromium, dissolved (mw-33-40)**											
2512												
2513	**General Statistics**											
2514				Number of Valid Data	34						Number of Detected Data	8
2515				Number of Distinct Detected Data	8						Number of Non-Detect Data	26
2516											Percent Non-Detects	76.47%
2517												
2518	**Raw Statistics**						**Log-transformed Statistics**					
2519				Minimum Detected	0.0011						Minimum Detected	-6.812
2520				Maximum Detected	0.0155						Maximum Detected	-4.167
2521				Mean of Detected	0.00541						Mean of Detected	-5.72
2522				SD of Detected	0.00605						SD of Detected	1.033
2523				Minimum Non-Detect	0.001						Minimum Non-Detect	-6.908
2524				Maximum Non-Detect	0.0049						Maximum Non-Detect	-5.319
2525												
2526	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	32
2527	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
2528	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	94.12%
2529												
2530	**Warning: There are only 8 Detected Values in this data**											
2531	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2532	**the resulting calculations may not be reliable enough tp draw conclusions**											
2533												
2534	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2535												
2536												
2537	**UCL Statistics**											
2538	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2539				Shapiro Wilk Test Statistic	0.698						Shapiro Wilk Test Statistic	0.867
2540				5% Shapiro Wilk Critical Value	0.818						5% Shapiro Wilk Critical Value	0.818
2541	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2542												
2543	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2544				DL/2 Substitution Method							DL/2 Substitution Method	

2545					Mean	0.00173					Mean	-7.094
2546					SD	0.00349					SD	0.952
2547					95% DL/2 (t) UCL	0.00274					95% H-Stat (DL/2) UCL	0.00139
2548												
2549					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2550					**MLE method failed to converge properly**						Mean in Log Scale	-8.535
2551											SD in Log Scale	2.087
2552											Mean in Original Scale	0.00141
2553											SD in Original Scale	0.00359
2554											95% Percentile Bootstrap UCL	0.00255
2555											95% BCA Bootstrap UCL	0.00286
2556												
2557					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
2558					k star (bias corrected)	0.793					**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
2559					Theta Star	0.00682						
2560					nu star	12.69						
2561												
2562					A-D Test Statistic	0.745					**Nonparametric Statistics**	
2563					5% A-D Critical Value	0.734					Kaplan-Meier (KM) Method	
2564					K-S Test Statistic	0.734					Mean	0.00212
2565					5% K-S Critical Value	0.301					SD	0.0033
2566					**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean	0.000605
2567											95% KM (t) UCL	0.00315
2568					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00312
2569					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00303
2570					Minimum	1E-09					95% KM (bootstrap t) UCL	0.00666
2571					Maximum	0.0616					95% KM (BCA) UCL	0.00386
2572					Mean	0.0223					95% KM (Percentile Bootstrap) UCL	0.00341
2573					Median	0.0172					95% KM (Chebyshev) UCL	0.00476
2574					SD	0.0192					97.5% KM (Chebyshev) UCL	0.0059
2575					k star	0.535					99% KM (Chebyshev) UCL	0.00814
2576					Theta star	0.0417						
2577					Nu star	36.38					**Potential UCLs to Use**	
2578					AppChi2	23.57					95% KM (t) UCL	0.00315
2579					95% Gamma Approximate UCL	0.0344						
2580					95% Adjusted Gamma UCL	0.0352						
2581	**Note: DL/2 is not a recommended method.**											
2582												
2583												
2584	**Chromium, dissolved (mw-33-90)**											
2585												
2586							**General Statistics**					
2587					Number of Valid Data	58					Number of Detected Data	56
2588					Number of Distinct Detected Data	40					Number of Non-Detect Data	2
2589											Percent Non-Detects	3.45%
2590												
2591					**Raw Statistics**						**Log-transformed Statistics**	
2592					Minimum Detected	0.0017					Minimum Detected	-6.377
2593					Maximum Detected	0.0218					Maximum Detected	-3.826
2594					Mean of Detected	0.0149					Mean of Detected	-4.258
2595					SD of Detected	0.00346					SD of Detected	0.387
2596					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
2597					Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908

2598												
2599												
2600	**UCL Statistics**											
2601	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2602					Lilliefors Test Statistic	0.134					Lilliefors Test Statistic	0.266
2603					5% Lilliefors Critical Value	0.118					5% Lilliefors Critical Value	0.118
2604	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2605												
2606	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2607					DL/2 Substitution Method						DL/2 Substitution Method	
2608					Mean	0.0144					Mean	-4.373
2609					SD	0.00431					SD	0.723
2610					95% DL/2 (t) UCL	0.0153					95% H-Stat (DL/2) UCL	0.0181
2611												
2612					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2613					Mean	0.0143					Mean in Log Scale	-4.281
2614					SD	0.00435					SD in Log Scale	0.4
2615					95% MLE (t) UCL	0.0153					Mean in Original Scale	0.0146
2616					95% MLE (Tiku) UCL	0.0153					SD in Original Scale	0.00368
2617											95% Percentile Bootstrap UCL	0.0154
2618											95% BCA Bootstrap UCL	0.0153
2619												
2620	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2621					k star (bias corrected)	9.846	**Data do not follow a Discernable Distribution (0.05)**					
2622					Theta Star	0.00151						
2623					nu star	1103						
2624												
2625					A-D Test Statistic	3.83	**Nonparametric Statistics**					
2626					5% A-D Critical Value	0.75					Kaplan-Meier (KM) Method	
2627					K-S Test Statistic	0.75					Mean	0.0144
2628					5% K-S Critical Value	0.119					SD	0.00414
2629	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0005482
2630											95% KM (t) UCL	0.0153
2631	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0153
2632					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0153
2633					Minimum	0.0017					95% KM (bootstrap t) UCL	0.0152
2634					Maximum	0.0218					95% KM (BCA) UCL	0.0154
2635					Mean	0.0145					95% KM (Percentile Bootstrap) UCL	0.0154
2636					Median	0.0146					95% KM (Chebyshev) UCL	0.0168
2637					SD	0.0038					97.5% KM (Chebyshev) UCL	0.0178
2638					k star	8.146					99% KM (Chebyshev) UCL	0.0199
2639					Theta star	0.00179						
2640					Nu star	944.9	**Potential UCLs to Use**					
2641					AppChi2	874.6					95% KM (Chebyshev) UCL	0.0168
2642					95% Gamma Approximate UCL	0.0157						
2643					95% Adjusted Gamma UCL	0.0157						
2644	**Note: DL/2 is not a recommended method.**											
2645												
2646												
2647	**Chromium, dissolved (mw-34-100)**											
2648												
2649	**General Statistics**											
2650					Number of Valid Observations	79					Number of Distinct Observations	75

2651												
2652	**Raw Statistics**						**Log-transformed Statistics**					
2653					Minimum	0.11					Minimum of Log Data	-2.207
2654					Maximum	1.19					Maximum of Log Data	0.174
2655					Mean	0.701					Mean of log Data	-0.402
2656					Median	0.67					SD of log Data	0.341
2657					SD	0.191						
2658					Coefficient of Variation	0.272						
2659					Skewness	-0.168						
2660												
2661	**Relevant UCL Statistics**											
2662	**Normal Distribution Test**						**Lognormal Distribution Test**					
2663					Lilliefors Test Statistic	0.0792					Lilliefors Test Statistic	0.106
2664					Lilliefors Critical Value	0.0997					Lilliefors Critical Value	0.0997
2665	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2666												
2667	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2668					95% Student's-t UCL	0.737					95% H-UCL	0.759
2669	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.83
2670					95% Adjusted-CLT UCL	0.736					97.5% Chebyshev (MVUE) UCL	0.883
2671					95% Modified-t UCL	0.737					99% Chebyshev (MVUE) UCL	0.986
2672												
2673	**Gamma Distribution Test**						**Data Distribution**					
2674					k star (bias corrected)	10.4	**Data appear Normal at 5% Significance Level**					
2675					Theta Star	0.0674						
2676					nu star	1643						
2677					Approximate Chi Square Value (.05)	1550	**Nonparametric Statistics**					
2678					Adjusted Level of Significance	0.047					95% CLT UCL	0.737
2679					Adjusted Chi Square Value	1548					95% Jackknife UCL	0.737
2680											95% Standard Bootstrap UCL	0.737
2681					Anderson-Darling Test Statistic	1.055					95% Bootstrap-t UCL	0.737
2682					Anderson-Darling 5% Critical Value	0.751					95% Hall's Bootstrap UCL	0.736
2683					Kolmogorov-Smirnov Test Statistic	0.0842					95% Percentile Bootstrap UCL	0.736
2684					Kolmogorov-Smirnov 5% Critical Value	0.1					95% BCA Bootstrap UCL	0.732
2685	**Data follow Appr. Gamma Distribution at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.795
2686											97.5% Chebyshev(Mean, Sd) UCL	0.835
2687	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.915
2688					95% Approximate Gamma UCL	0.743						
2689					95% Adjusted Gamma UCL	0.744						
2690												
2691	**Potential UCL to Use**										Use 95% Student's-t UCL	0.737
2692												
2693												
2694	**Chromium, dissolved (mw-34-55)**											
2695												
2696	**General Statistics**											
2697					Number of Valid Data	52					Number of Detected Data	7
2698					Number of Distinct Detected Data	7					Number of Non-Detect Data	45
2699											Percent Non-Detects	86.54%
2700												
2701	**Raw Statistics**						**Log-transformed Statistics**					
2702					Minimum Detected	0.0014					Minimum Detected	-6.571
2703					Maximum Detected	0.0065					Maximum Detected	-5.036

2704				Mean of Detected	0.00297					Mean of Detected	-5.982	
2705				SD of Detected	0.00192					SD of Detected	0.604	
2706				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
2707				Maximum Non-Detect	0.0017					Maximum Non-Detect	-6.377	
2708												
2709	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	47	
2710	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	5	
2711	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	90.38%	
2712												
2713	**Warning: There are only 7 Detected Values in this data**											
2714	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2715	**the resulting calculations may not be reliable enough tp draw conclusions**											
2716												
2717	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2718												
2719												
2720	**UCL Statistics**											
2721	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
2722				Lilliefors Test Statistic	0.824					Lilliefors Test Statistic	0.864	
2723				5% Lilliefors Critical Value	0.803					5% Lilliefors Critical Value	0.803	
2724	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
2725												
2726	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
2727				DL/2 Substitution Method						DL/2 Substitution Method		
2728				Mean	0.0008452					Mean	-7.363	
2729				SD	0.00107					SD	0.594	
2730				95% DL/2 (t) UCL	0.00109					95% H-Stat (DL/2) UCL	0.0007718	
2731												
2732				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2733	**MLE yields a negative mean**									Mean in Log Scale	-8.587	
2734										SD in Log Scale	1.572	
2735										Mean in Original Scale	0.0006	
2736										SD in Original Scale	0.00117	
2737										95% Percentile Bootstrap UCL	0.0008937	
2738										95% BCA Bootstrap UCL	0.0009778	
2739												
2740	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
2741				k star (bias corrected)	1.931					**Data appear Normal at 5% Significance Level**		
2742				Theta Star	0.00154							
2743				nu star	27.04							
2744												
2745				A-D Test Statistic	0.578					**Nonparametric Statistics**		
2746				5% A-D Critical Value	0.712					Kaplan-Meier (KM) Method		
2747				K-S Test Statistic	0.712					Mean	0.00161	
2748				5% K-S Critical Value	0.314					SD	0.0008434	
2749	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.0001263	
2750										95% KM (t) UCL	0.00182	
2751	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00182	
2752				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00177	
2753				Minimum	0.0003829					95% KM (bootstrap t) UCL	0.00196	
2754				Maximum	0.0168					95% KM (BCA) UCL	0.00219	
2755				Mean	0.00937					95% KM (Percentile Bootstrap) UCL	0.00197	
2756				Median	0.00994					95% KM (Chebyshev) UCL	0.00216	

2757					SD	0.00487				97.5% KM (Chebyshev) UCL		0.0024
2758					k star	2.206				99% KM (Chebyshev) UCL		0.00287
2759					Theta star	0.00425						
2760					Nu star	229.4				**Potential UCLs to Use**		
2761					AppChi2	195.3				95% KM (t) UCL		0.00182
2762					95% Gamma Approximate UCL	0.011				95% KM (Percentile Bootstrap) UCL		0.00197
2763					95% Adjusted Gamma UCL	0.0111						
2764	**Note: DL/2 is not a recommended method.**											
2765												
2766												
2767	**Chromium, dissolved (mw-34-80)**											
2768												
2769					**General Statistics**							
2770					Number of Valid Data	92				Number of Detected Data		23
2771					Number of Distinct Detected Data	21				Number of Non-Detect Data		69
2772										Percent Non-Detects		75.00%
2773												
2774					**Raw Statistics**					**Log-transformed Statistics**		
2775					Minimum Detected	0.0011				Minimum Detected		-6.812
2776					Maximum Detected	0.111				Maximum Detected		-2.198
2777					Mean of Detected	0.0151				Mean of Detected		-5.161
2778					SD of Detected	0.0259				SD of Detected		1.356
2779					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
2780					Maximum Non-Detect	0.001				Maximum Non-Detect		-6.908
2781												
2782												
2783					**UCL Statistics**							
2784					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
2785					Lilliefors Test Statistic	0.588				Lilliefors Test Statistic		0.926
2786					5% Lilliefors Critical Value	0.914				5% Lilliefors Critical Value		0.914
2787					**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
2788												
2789					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
2790					DL/2 Substitution Method					DL/2 Substitution Method		
2791					Mean	0.00414				Mean		-6.991
2792					SD	0.0142				SD		1.254
2793					95% DL/2 (t) UCL	0.00661				95% H-Stat (DL/2) UCL		0.00197
2794												
2795					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
2796					**MLE yields a negative mean**					Mean in Log Scale		-9.003
2797										SD in Log Scale		2.989
2798										Mean in Original Scale		0.00388
2799										SD in Original Scale		0.0143
2800										95% Percentile Bootstrap UCL		0.00669
2801										95% BCA Bootstrap UCL		0.00759
2802												
2803					**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**		
2804					k star (bias corrected)	0.58				**Data appear Lognormal at 5% Significance Level**		
2805					Theta Star	0.026						
2806					nu star	26.69						
2807												
2808					A-D Test Statistic	1.278				**Nonparametric Statistics**		
2809					5% A-D Critical Value	0.793				Kaplan-Meier (KM) Method		

2810				K-S Test Statistic	0.793					Mean	0.00459	
2811				5% K-S Critical Value	0.19					SD	0.014	
2812				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00149	
2813										95% KM (t) UCL	0.00708	
2814				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00705	
2815				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00697	
2816				Minimum	1E-09					95% KM (bootstrap t) UCL	0.0106	
2817				Maximum	0.418					95% KM (BCA) UCL	0.00766	
2818				Mean	0.117					95% KM (Percentile Bootstrap) UCL	0.00729	
2819				Median	0.0635					95% KM (Chebyshev) UCL	0.0111	
2820				SD	0.128					97.5% KM (Chebyshev) UCL	0.0139	
2821				k star	0.3					99% KM (Chebyshev) UCL	0.0195	
2822				Theta star	0.39							
2823				Nu star	55.15					**Potential UCLs to Use**		
2824				AppChi2	39.08					95% KM (BCA) UCL	0.00766	
2825				95% Gamma Approximate UCL	0.165							
2826				95% Adjusted Gamma UCL	0.166							
2827	**Note: DL/2 is not a recommended method.**											
2828												
2829												
2830	**Chromium, dissolved (mw-35-135)**											
2831												
2832					**General Statistics**							
2833				Number of Valid Data	14					Number of Detected Data	13	
2834				Number of Distinct Detected Data	13					Number of Non-Detect Data	1	
2835										Percent Non-Detects	7.14%	
2836												
2837				**Raw Statistics**						**Log-transformed Statistics**		
2838				Minimum Detected	0.0066					Minimum Detected	-5.021	
2839				Maximum Detected	0.0392					Maximum Detected	-3.239	
2840				Mean of Detected	0.0223					Mean of Detected	-3.887	
2841				SD of Detected	0.00879					SD of Detected	0.46	
2842				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
2843				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
2844												
2845												
2846					**UCL Statistics**							
2847				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
2848				Shapiro Wilk Test Statistic	0.986					Shapiro Wilk Test Statistic	0.932	
2849				5% Shapiro Wilk Critical Value	0.866					5% Shapiro Wilk Critical Value	0.866	
2850				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
2851												
2852				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
2853				DL/2 Substitution Method						DL/2 Substitution Method		
2854				Mean	0.0208					Mean	-4.152	
2855				SD	0.0103					SD	1.087	
2856				95% DL/2 (t) UCL	0.0256					95% H-Stat (DL/2) UCL	0.0445	
2857												
2858				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
2859				Mean	0.0205					Mean in Log Scale	-3.964	
2860				SD	0.0105					SD in Log Scale	0.527	
2861				95% MLE (t) UCL	0.0255					Mean in Original Scale	0.0212	
2862				95% MLE (Tiku) UCL	0.0256					SD in Original Scale	0.00939	

2863											95% Percentile Bootstrap UCL	0.0252
2864											95% BCA Bootstrap UCL	0.0253
2865												
2866	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2867					k star (bias corrected)	4.684	**Data appear Normal at 5% Significance Level**					
2868					Theta Star	0.00477						
2869					nu star	121.8						
2870												
2871					A-D Test Statistic	0.196	**Nonparametric Statistics**					
2872					5% A-D Critical Value	0.735					Kaplan-Meier (KM) Method	
2873					K-S Test Statistic	0.735					Mean	0.0212
2874					5% K-S Critical Value	0.237					SD	0.00909
2875	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00253
2876											95% KM (t) UCL	0.0257
2877	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0254
2878					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0256
2879					Minimum	0.00369					95% KM (bootstrap t) UCL	0.0258
2880					Maximum	0.0392					95% KM (BCA) UCL	0.0257
2881					Mean	0.021					95% KM (Percentile Bootstrap) UCL	0.0256
2882					Median	0.0211					95% KM (Chebyshev) UCL	0.0322
2883					SD	0.00981					97.5% KM (Chebyshev) UCL	0.037
2884					k star	2.855					99% KM (Chebyshev) UCL	0.0464
2885					Theta star	0.00736						
2886					Nu star	79.93	**Potential UCLs to Use**					
2887					AppChi2	60.33					95% KM (t) UCL	0.0257
2888					95% Gamma Approximate UCL	0.0278					95% KM (Percentile Bootstrap) UCL	0.0256
2889					95% Adjusted Gamma UCL	0.0289						
2890	**Note: DL/2 is not a recommended method.**											
2891												
2892												
2893	**Chromium, dissolved (mw-35-60)**											
2894												
2895						**General Statistics**						
2896					Number of Valid Observations	14					Number of Distinct Observations	14
2897												
2898					**Raw Statistics**						**Log-transformed Statistics**	
2899					Minimum	0.0054					Minimum of Log Data	-5.221
2900					Maximum	0.038					Maximum of Log Data	-3.27
2901					Mean	0.0275					Mean of log Data	-3.676
2902					Median	0.0281					SD of log Data	0.495
2903					SD	0.00877						
2904					Coefficient of Variation	0.319						
2905					Skewness	-1.164						
2906												
2907						**Relevant UCL Statistics**						
2908					**Normal Distribution Test**						**Lognormal Distribution Test**	
2909					Shapiro Wilk Test Statistic	0.917					Shapiro Wilk Test Statistic	0.71
2910					Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value	0.874
2911					**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
2912												
2913					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2914					95% Student's-t UCL	0.0316					95% H-UCL	0.0377
2915					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0452

2916				95% Adjusted-CLT UCL	0.0305					97.5% Chebyshev (MVUE) UCL	0.0524	
2917				95% Modified-t UCL	0.0315					99% Chebyshev (MVUE) UCL	0.0667	
2918												
2919				**Gamma Distribution Test**						**Data Distribution**		
2920				k star (bias corrected)	4.977					**Data appear Normal at 5% Significance Level**		
2921				Theta Star	0.00552							
2922				nu star	139.4							
2923				Approximate Chi Square Value (.05)	113.1					**Nonparametric Statistics**		
2924				Adjusted Level of Significance	0.0312					95% CLT UCL	0.0313	
2925				Adjusted Chi Square Value	110					95% Jackknife UCL	0.0316	
2926										95% Standard Bootstrap UCL	0.0312	
2927				Anderson-Darling Test Statistic	0.925					95% Bootstrap-t UCL	0.031	
2928				Anderson-Darling 5% Critical Value	0.737					95% Hall's Bootstrap UCL	0.0306	
2929				Kolmogorov-Smirnov Test Statistic	0.196					95% Percentile Bootstrap UCL	0.0311	
2930				Kolmogorov-Smirnov 5% Critical Value	0.229					95% BCA Bootstrap UCL	0.0305	
2931				**Data follow Appr. Gamma Distribution at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0377	
2932										97.5% Chebyshev(Mean, Sd) UCL	0.0421	
2933				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0508	
2934				95% Approximate Gamma UCL	0.0339							
2935				95% Adjusted Gamma UCL	0.0348							
2936												
2937				**Potential UCL to Use**						Use 95% Student's-t UCL	0.0316	
2938												
2939												
2940	**Chromium, dissolved (mw-36-100)**											
2941												
2942				**General Statistics**								
2943				Number of Valid Observations	51					Number of Distinct Observations	48	
2944												
2945				**Raw Statistics**						**Log-transformed Statistics**		
2946				Minimum	0.184					Minimum of Log Data	-1.693	
2947				Maximum	3.18					Maximum of Log Data	1.157	
2948				Mean	0.982					Mean of log Data	-0.33	
2949				Median	0.561					SD of log Data	0.806	
2950				SD	0.785							
2951				Coefficient of Variation	0.8							
2952				Skewness	1.043							
2953												
2954				**Relevant UCL Statistics**								
2955				**Normal Distribution Test**						**Lognormal Distribution Test**		
2956				Lilliefors Test Statistic	0.22					Lilliefors Test Statistic	0.131	
2957				Lilliefors Critical Value	0.124					Lilliefors Critical Value	0.124	
2958				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
2959												
2960				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
2961				95% Student's-t UCL	1.166					95% H-UCL	1.266	
2962				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	1.531	
2963				95% Adjusted-CLT UCL	1.18					97.5% Chebyshev (MVUE) UCL	1.767	
2964				95% Modified-t UCL	1.169					99% Chebyshev (MVUE) UCL	2.229	
2965												
2966				**Gamma Distribution Test**						**Data Distribution**		
2967				k star (bias corrected)	1.664					**Data do not follow a Discernable Distribution (0.05)**		
2968				Theta Star	0.59							

2969					nu star	169.7						
2970					Approximate Chi Square Value (.05)	140.6		**Nonparametric Statistics**				
2971					Adjusted Level of Significance	0.0453					95% CLT UCL	1.163
2972					Adjusted Chi Square Value	139.8					95% Jackknife UCL	1.166
2973											95% Standard Bootstrap UCL	1.165
2974					Anderson-Darling Test Statistic	1.509					95% Bootstrap-t UCL	1.191
2975					Anderson-Darling 5% Critical Value	0.765					95% Hall's Bootstrap UCL	1.181
2976					Kolmogorov-Smirnov Test Statistic	0.171					95% Percentile Bootstrap UCL	1.18
2977					Kolmogorov-Smirnov 5% Critical Value	0.126					95% BCA Bootstrap UCL	1.182
2978					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1.461
2979											97.5% Chebyshev(Mean, Sd) UCL	1.669
2980					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	2.076
2981					95% Approximate Gamma UCL	1.185						
2982					95% Adjusted Gamma UCL	1.192						
2983												
2984					**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	1.461
2985												
2986												
2987	**Chromium, dissolved (mw-36-20)**											
2988												
2989					**General Statistics**							
2990					Number of Valid Data	17					Number of Detected Data	4
2991					Number of Distinct Detected Data	3					Number of Non-Detect Data	13
2992											Percent Non-Detects	76.47%
2993												
2994					**Raw Statistics**			**Log-transformed Statistics**				
2995					Minimum Detected	0.0014					Minimum Detected	-6.571
2996					Maximum Detected	0.0065					Maximum Detected	-5.036
2997					Mean of Detected	0.00318					Mean of Detected	-5.918
2998					SD of Detected	0.00227					SD of Detected	0.641
2999					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
3000					Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908
3001												
3002												
3003					**Warning: There are only 3 Distinct Detected Values in this data set**							
3004					**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**							
3005					**Those methods will return a 'N/A' value on your output display!**							
3006												
3007					**It is necessary to have 4 or more Distinct Values for bootstrap methods.**							
3008					**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**							
3009												
3010												
3011					**UCL Statistics**							
3012					**Normal Distribution Test with Detected Values Only**			**Lognormal Distribution Test with Detected Values Only**				
3013					Shapiro Wilk Test Statistic	0.797					Shapiro Wilk Test Statistic	0.904
3014					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
3015					**Data appear Normal at 5% Significance Level**			**Data appear Lognormal at 5% Significance Level**				
3016												
3017					**Assuming Normal Distribution**			**Assuming Lognormal Distribution**				
3018					DL/2 Substitution Method						DL/2 Substitution Method	
3019					Mean	0.00113					Mean	-7.205
3020					SD	0.00153					SD	0.786
3021					95% DL/2 (t) UCL	0.00178					95% H-Stat (DL/2) UCL	0.00149

3022												
3023					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3024					**MLE yields a negative mean**						Mean in Log Scale	-8.126
3025											SD in Log Scale	1.644
3026											Mean in Original Scale	0.0009394
3027											SD in Original Scale	0.00162
3028											95% Percentile Bootstrap UCL	0.00163
3029											95% BCA Bootstrap UCL	0.00206
3030												
3031					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
3032					k star (bias corrected)	0.961					**Data appear Normal at 5% Significance Level**	
3033					Theta Star	0.0033						
3034					nu star	7.689						
3035												
3036					A-D Test Statistic	0.463					**Nonparametric Statistics**	
3037					5% A-D Critical Value	0.659					Kaplan-Meier (KM) Method	
3038					K-S Test Statistic	0.659					Mean	0.00182
3039					5% K-S Critical Value	0.396					SD	0.00121
3040					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0003399
3041											95% KM (t) UCL	0.00241
3042					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00238
3043					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00253
3044					Minimum	0.0008874					95% KM (bootstrap t) UCL	0.00295
3045					Maximum	0.0203					95% KM (BCA) UCL	0.00312
3046					Mean	0.0087					95% KM (Percentile Bootstrap) UCL	0.00312
3047					Median	0.00708					95% KM (Chebyshev) UCL	0.0033
3048					SD	0.00639					97.5% KM (Chebyshev) UCL	0.00394
3049					k star	1.33					99% KM (Chebyshev) UCL	0.0052
3050					Theta star	0.00655						
3051					Nu star	45.21					**Potential UCLs to Use**	
3052					AppChi2	30.79					95% KM (t) UCL	0.00241
3053					95% Gamma Approximate UCL	0.0128					95% KM (Percentile Bootstrap) UCL	0.00312
3054					95% Adjusted Gamma UCL	N/A						
3055	**Note: DL/2 is not a recommended method.**											
3056												
3057												
3058	**Chromium, dissolved (mw-36-40)**											
3059												
3060					**General Statistics**							
3061					Number of Valid Data	17					Number of Detected Data	1
3062					Number of Distinct Detected Data	1					Number of Non-Detect Data	16
3063											Percent Non-Detects	94.12%
3064												
3065	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
3066	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
3067												
3068	**The data set for variable Chromium, dissolved (mw-36-40) was not processed!**											
3069												
3070												
3071												
3072	**Chromium, dissolved (mw-36-50)**											
3073												
3074					**General Statistics**							

3075				Number of Valid Data	17					Number of Detected Data	2	
3076				Number of Distinct Detected Data	2					Number of Non-Detect Data	15	
3077										Percent Non-Detects	88.24%	
3078												
3079				**Raw Statistics**						**Log-transformed Statistics**		
3080				Minimum Detected	0.0012					Minimum Detected	-6.725	
3081				Maximum Detected	0.002					Maximum Detected	-6.215	
3082				Mean of Detected	0.0016					Mean of Detected	-6.47	
3083				SD of Detected	0.0005657					SD of Detected	0.361	
3084				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
3085				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
3086												
3087												
3088						**Warning: Data set has only 2 Distinct Detected Values.**							
3089						**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**						
3090						**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**						
3091												
3092						**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**						
3093												
3094						**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**						
3095						**Those methods will return a 'N/A' value on your output display!**						
3096												
3097						**It is necessary to have 4 or more Distinct Values for bootstrap methods.**						
3098						**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**						
3099												
3100												
3101						**UCL Statistics**							
3102				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
3103				Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1	
3104				5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A	
3105				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
3106												
3107				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
3108				DL/2 Substitution Method						DL/2 Substitution Method		
3109				Mean	0.0006294					Mean	-7.468	
3110				SD	0.0003917					SD	0.386	
3111				95% DL/2 (t) UCL	0.0007953					95% H-Stat (DL/2) UCL	0.0006711	
3112												
3113				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3114				**MLE method failed to converge properly**						Mean in Log Scale	N/A	
3115										SD in Log Scale	N/A	
3116										Mean in Original Scale	N/A	
3117										SD in Original Scale	N/A	
3118										95% Percentile Bootstrap UCL	N/A	
3119										95% BCA Bootstrap UCL	N/A	
3120												
3121				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
3122				k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**		
3123				Theta Star	N/A							
3124				nu star	N/A							
3125												
3126				A-D Test Statistic	0.359					**Nonparametric Statistics**		
3127				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		

3128				K-S Test Statistic	N/A					Mean	0.00125
3129				5% K-S Critical Value	N/A					SD	0.0001882
3130	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	6.456E-05
3131										95% KM (t) UCL	0.00136
3132	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00135
3133				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	N/A
3134				Minimum	N/A					95% KM (bootstrap t) UCL	N/A
3135				Maximum	N/A					95% KM (BCA) UCL	N/A
3136				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
3137				Median	N/A					95% KM (Chebyshev) UCL	0.00153
3138				SD	N/A					97.5% KM (Chebyshev) UCL	0.00165
3139				k star	N/A					99% KM (Chebyshev) UCL	0.00189
3140				Theta star	N/A						
3141				Nu star	N/A					**Potential UCLs to Use**	
3142				AppChi2	N/A					95% KM (t) UCL	0.00136
3143				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A
3144				95% Adjusted Gamma UCL	N/A						
3145	**Note: DL/2 is not a recommended method.**										
3146											
3147											
3148	**Chromium, dissolved (mw-36-70)**										
3149											
3150	**General Statistics**										
3151				Number of Valid Data	26					Number of Detected Data	3
3152				Number of Distinct Detected Data	2					Number of Non-Detect Data	23
3153										Percent Non-Detects	88.46%
3154											
3155	**Raw Statistics**						**Log-transformed Statistics**				
3156				Minimum Detected	0.0012					Minimum Detected	-6.725
3157				Maximum Detected	0.0016					Maximum Detected	-6.438
3158				Mean of Detected	0.00133					Mean of Detected	-6.63
3159				SD of Detected	0.0002309					SD of Detected	0.166
3160				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
3161				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908
3162											
3163											
3164	**Warning: Data set has only 2 Distinct Detected Values.**										
3165	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**										
3166	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**										
3167											
3168	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**										
3169											
3170	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**										
3171	**Those methods will return a 'N/A' value on your output display!**										
3172											
3173	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**										
3174	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**										
3175											
3176											
3177	**UCL Statistics**										
3178	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**				
3179				Shapiro Wilk Test Statistic	0.75					Shapiro Wilk Test Statistic	0.75
3180				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767

3181	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3182												
3183	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3184	DL/2 Substitution Method						DL/2 Substitution Method					
3185	Mean				0.0005962		Mean					-7.489
3186	SD				0.0002793		SD					0.32
3187	95% DL/2 (t) UCL				0.0006897		95% H-Stat (DL/2) UCL					0.0006461
3188												
3189	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
3190	Mean				0.0002545		Mean in Log Scale					-7.537
3191	SD				0.0006286		SD in Log Scale					0.528
3192	95% MLE (t) UCL				0.0004651		Mean in Original Scale					0.00061
3193	95% MLE (Tiku) UCL				0.00104		SD in Original Scale					0.000338
3194							95% Percentile Bootstrap UCL					0.0007225
3195							95% BCA Bootstrap UCL					0.0007321
3196												
3197	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3198	k star (bias corrected)				N/A		**Data do not follow a Discernable Distribution (0.05)**					
3199	Theta Star				N/A							
3200	nu star				N/A							
3201												
3202	A-D Test Statistic				0.619		**Nonparametric Statistics**					
3203	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
3204	K-S Test Statistic				N/A		Mean					0.00122
3205	5% K-S Critical Value				N/A		SD					7.692E-05
3206	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					1.848E-05
3207							95% KM (t) UCL					0.00125
3208	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00125
3209	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					N/A
3210	Minimum				N/A		95% KM (bootstrap t) UCL					N/A
3211	Maximum				N/A		95% KM (BCA) UCL					N/A
3212	Mean				N/A		95% KM (Percentile Bootstrap) UCL					N/A
3213	Median				N/A		95% KM (Chebyshev) UCL					0.0013
3214	SD				N/A		97.5% KM (Chebyshev) UCL					0.00133
3215	k star				N/A		99% KM (Chebyshev) UCL					0.0014
3216	Theta star				N/A							
3217	Nu star				N/A		**Potential UCLs to Use**					
3218	AppChi2				N/A		95% KM (t) UCL					0.00125
3219	95% Gamma Approximate UCL				N/A		95% KM (% Bootstrap) UCL					N/A
3220	95% Adjusted Gamma UCL				N/A							
3221	**Note: DL/2 is not a recommended method.**											
3222												
3223												
3224	**Chromium, dissolved (mw-36-90)**											
3225												
3226	**General Statistics**											
3227	Number of Valid Observations				39		Number of Distinct Observations					38
3228												
3229	**Raw Statistics**						**Log-transformed Statistics**					
3230	Minimum				0.0018		Minimum of Log Data					-6.32
3231	Maximum				3.45		Maximum of Log Data					1.238
3232	Mean				0.67		Mean of log Data					-2.747
3233	Median				0.0275		SD of log Data					2.669

3234					SD	1.085						
3235					Coefficient of Variation	1.619						
3236					Skewness	1.578						
3237												
3238	**Relevant UCL Statistics**											
3239	**Normal Distribution Test**						**Lognormal Distribution Test**					
3240					Shapiro Wilk Test Statistic	0.658					Shapiro Wilk Test Statistic	0.865
3241					Shapiro Wilk Critical Value	0.939					Shapiro Wilk Critical Value	0.939
3242	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3243												
3244	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3245					95% Student's-t UCL	0.963					95% H-UCL	16.95
3246	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	6.019
3247					95% Adjusted-CLT UCL	1.003					97.5% Chebyshev (MVUE) UCL	7.929
3248					95% Modified-t UCL	0.97					99% Chebyshev (MVUE) UCL	11.68
3249												
3250	**Gamma Distribution Test**						**Data Distribution**					
3251					k star (bias corrected)	0.289	**Data do not follow a Discernable Distribution (0.05)**					
3252					Theta Star	2.317						
3253					nu star	22.55						
3254					Approximate Chi Square Value (.05)	12.75	**Nonparametric Statistics**					
3255					Adjusted Level of Significance	0.0437					95% CLT UCL	0.956
3256					Adjusted Chi Square Value	12.46					95% Jackknife UCL	0.963
3257											95% Standard Bootstrap UCL	0.95
3258					Anderson-Darling Test Statistic	2.091					95% Bootstrap-t UCL	1.058
3259					Anderson-Darling 5% Critical Value	0.86					95% Hall's Bootstrap UCL	0.984
3260					Kolmogorov-Smirnov Test Statistic	0.219					95% Percentile Bootstrap UCL	0.965
3261					Kolmogorov-Smirnov 5% Critical Value	0.154					95% BCA Bootstrap UCL	0.989
3262	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	1.427
3263											97.5% Chebyshev(Mean, Sd) UCL	1.755
3264	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	2.398
3265					95% Approximate Gamma UCL	1.185						
3266					95% Adjusted Gamma UCL	1.213						
3267												
3268	**Potential UCL to Use**										Use 99% Chebyshev (Mean, Sd) UCL	2.398
3269												
3270												
3271	**Chromium, dissolved (mw-37d)**											
3272												
3273	**General Statistics**											
3274					Number of Valid Observations	15					Number of Distinct Observations	13
3275												
3276	**Raw Statistics**						**Log-transformed Statistics**					
3277					Minimum	0.794					Minimum of Log Data	-0.231
3278					Maximum	1.97					Maximum of Log Data	0.678
3279					Mean	1.386					Mean of log Data	0.294
3280					Median	1.31					SD of log Data	0.27
3281					SD	0.358						
3282					Coefficient of Variation	0.258						
3283					Skewness	0.0844						
3284												
3285	**Relevant UCL Statistics**											
3286	**Normal Distribution Test**						**Lognormal Distribution Test**					

3287					Shapiro Wilk Test Statistic	0.962					Shapiro Wilk Test Statistic	0.959
3288					Shapiro Wilk Critical Value	0.881					Shapiro Wilk Critical Value	0.881
3289					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
3290												
3291					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3292					95% Student's-t UCL	1.549					95% H-UCL	1.59
3293					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	1.813
3294					95% Adjusted-CLT UCL	1.54					97.5% Chebyshev (MVUE) UCL	1.996
3295					95% Modified-t UCL	1.549					99% Chebyshev (MVUE) UCL	2.358
3296												
3297					**Gamma Distribution Test**						**Data Distribution**	
3298					k star (bias corrected)	12.38					**Data appear Normal at 5% Significance Level**	
3299					Theta Star	0.112						
3300					nu star	371.3						
3301					Approximate Chi Square Value (.05)	327.6					**Nonparametric Statistics**	
3302					Adjusted Level of Significance	0.0324					95% CLT UCL	1.538
3303					Adjusted Chi Square Value	322.6					95% Jackknife UCL	1.549
3304											95% Standard Bootstrap UCL	1.534
3305					Anderson-Darling Test Statistic	0.245					95% Bootstrap-t UCL	1.552
3306					Anderson-Darling 5% Critical Value	0.736					95% Hall's Bootstrap UCL	1.54
3307					Kolmogorov-Smirnov Test Statistic	0.141					95% Percentile Bootstrap UCL	1.538
3308					Kolmogorov-Smirnov 5% Critical Value	0.221					95% BCA Bootstrap UCL	1.531
3309					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1.789
3310											97.5% Chebyshev(Mean, Sd) UCL	1.963
3311					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	2.305
3312					95% Approximate Gamma UCL	1.571						
3313					95% Adjusted Gamma UCL	1.596						
3314												
3315					**Potential UCL to Use**						Use 95% Student's-t UCL	1.549
3316												
3317												
3318	**Chromium, dissolved (mw-37s)**											
3319												
3320					**General Statistics**							
3321					Number of Valid Observations	14					Number of Distinct Observations	12
3322												
3323					**Raw Statistics**						**Log-transformed Statistics**	
3324					Minimum	0.0026					Minimum of Log Data	-5.952
3325					Maximum	0.0093					Maximum of Log Data	-4.678
3326					Mean	0.0061					Mean of log Data	-5.165
3327					Median	0.0067					SD of log Data	0.403
3328					SD	0.00203						
3329					Coefficient of Variation	0.332						
3330					Skewness	-0.542						
3331												
3332					**Relevant UCL Statistics**							
3333					**Normal Distribution Test**						**Lognormal Distribution Test**	
3334					Shapiro Wilk Test Statistic	0.924					Shapiro Wilk Test Statistic	0.846
3335					Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value	0.874
3336					**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
3337												
3338					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3339					95% Student's-t UCL	0.00706					95% H-UCL	0.00773

3340	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.0091	
3341	95% Adjusted-CLT UCL	0.00691								97.5% Chebyshev (MVUE) UCL	0.0104	
3342	95% Modified-t UCL	0.00705								99% Chebyshev (MVUE) UCL	0.0129	
3343												
3344	**Gamma Distribution Test**									**Data Distribution**		
3345	k star (bias corrected)	6.144								**Data appear Normal at 5% Significance Level**		
3346	Theta Star	0.0009928										
3347	nu star	172										
3348	Approximate Chi Square Value (.05)	142.7								**Nonparametric Statistics**		
3349	Adjusted Level of Significance	0.0312								95% CLT UCL	0.00699	
3350	Adjusted Chi Square Value	139.2								95% Jackknife UCL	0.00706	
3351										95% Standard Bootstrap UCL	0.00695	
3352	Anderson-Darling Test Statistic	0.824								95% Bootstrap-t UCL	0.007	
3353	Anderson-Darling 5% Critical Value	0.736								95% Hall's Bootstrap UCL	0.00693	
3354	Kolmogorov-Smirnov Test Statistic	0.205								95% Percentile Bootstrap UCL	0.00694	
3355	Kolmogorov-Smirnov 5% Critical Value	0.229								95% BCA Bootstrap UCL	0.00691	
3356	**Data follow Appr. Gamma Distribution at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.00846	
3357										97.5% Chebyshev(Mean, Sd) UCL	0.00948	
3358	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.0115	
3359	95% Approximate Gamma UCL	0.00735										
3360	95% Adjusted Gamma UCL	0.00754										
3361												
3362	**Potential UCL to Use**									Use 95% Student's-t UCL	0.00706	
3363												
3364												
3365	**Chromium, dissolved (mw-38d)**											
3366												
3367	**General Statistics**											
3368	Number of Valid Observations	11								Number of Distinct Observations	11	
3369												
3370	**Raw Statistics**									**Log-transformed Statistics**		
3371	Minimum	0.0296								Minimum of Log Data	-3.52	
3372	Maximum	0.323								Maximum of Log Data	-1.13	
3373	Mean	0.154								Mean of log Data	-2.085	
3374	Median	0.106								SD of log Data	0.727	
3375	SD	0.0961										
3376	Coefficient of Variation	0.625										
3377	Skewness	0.488										
3378												
3379	**Relevant UCL Statistics**											
3380	**Normal Distribution Test**									**Lognormal Distribution Test**		
3381	Shapiro Wilk Test Statistic	0.92								Shapiro Wilk Test Statistic	0.94	
3382	Shapiro Wilk Critical Value	0.85								Shapiro Wilk Critical Value	0.85	
3383	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
3384												
3385	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
3386	95% Student's-t UCL	0.206								95% H-UCL	0.288	
3387	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.314	
3388	95% Adjusted-CLT UCL	0.206								97.5% Chebyshev (MVUE) UCL	0.381	
3389	95% Modified-t UCL	0.207								99% Chebyshev (MVUE) UCL	0.514	
3390												
3391	**Gamma Distribution Test**									**Data Distribution**		
3392	k star (bias corrected)	1.887								**Data appear Normal at 5% Significance Level**		

3393					Theta Star	0.0814						
3394					nu star	41.52						
3395					Approximate Chi Square Value (.05)	27.75				**Nonparametric Statistics**		
3396					Adjusted Level of Significance	0.0278				95% CLT UCL	0.201	
3397					Adjusted Chi Square Value	25.93				95% Jackknife UCL	0.206	
3398										95% Standard Bootstrap UCL	0.199	
3399					Anderson-Darling Test Statistic	0.336				95% Bootstrap-t UCL	0.212	
3400					Anderson-Darling 5% Critical Value	0.736				95% Hall's Bootstrap UCL	0.201	
3401					Kolmogorov-Smirnov Test Statistic	0.177				95% Percentile Bootstrap UCL	0.202	
3402					Kolmogorov-Smirnov 5% Critical Value	0.258				95% BCA Bootstrap UCL	0.202	
3403					**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	0.28	
3404										97.5% Chebyshev(Mean, Sd) UCL	0.335	
3405					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	0.442	
3406					95% Approximate Gamma UCL	0.23						
3407					95% Adjusted Gamma UCL	0.246						
3408												
3409					**Potential UCL to Use**					Use 95% Student's-t UCL	0.206	
3410												
3411												
3412	**Chromium, dissolved (mw-38s)**											
3413												
3414					**General Statistics**							
3415					Number of Valid Observations	11				Number of Distinct Observations	11	
3416												
3417					**Raw Statistics**					**Log-transformed Statistics**		
3418					Minimum	0.373				Minimum of Log Data	-0.986	
3419					Maximum	1.01				Maximum of Log Data	0.00995	
3420					Mean	0.793				Mean of log Data	-0.269	
3421					Median	0.846				SD of log Data	0.305	
3422					SD	0.195						
3423					Coefficient of Variation	0.246						
3424					Skewness	-1.367						
3425												
3426					**Relevant UCL Statistics**							
3427					**Normal Distribution Test**					**Lognormal Distribution Test**		
3428					Shapiro Wilk Test Statistic	0.849				Shapiro Wilk Test Statistic	0.772	
3429					Shapiro Wilk Critical Value	0.85				Shapiro Wilk Critical Value	0.85	
3430					**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**		
3431												
3432					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
3433					95% Student's-t UCL	0.899				95% H-UCL	0.967	
3434					**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL	1.12	
3435					95% Adjusted-CLT UCL	0.863				97.5% Chebyshev (MVUE) UCL	1.259	
3436					95% Modified-t UCL	0.895				99% Chebyshev (MVUE) UCL	1.533	
3437												
3438					**Gamma Distribution Test**					**Data Distribution**		
3439					k star (bias corrected)	10.12				**Data Follow Appr. Gamma Distribution at 5% Significance Level**		
3440					Theta Star	0.0783						
3441					nu star	222.7						
3442					Approximate Chi Square Value (.05)	189.1				**Nonparametric Statistics**		
3443					Adjusted Level of Significance	0.0278				95% CLT UCL	0.889	
3444					Adjusted Chi Square Value	184.1				95% Jackknife UCL	0.899	
3445										95% Standard Bootstrap UCL	0.885	

3446				Anderson-Darling Test Statistic	1.017					95% Bootstrap-t UCL	0.876
3447				Anderson-Darling 5% Critical Value	0.729					95% Hall's Bootstrap UCL	0.867
3448				Kolmogorov-Smirnov Test Statistic	0.254					95% Percentile Bootstrap UCL	0.882
3449				Kolmogorov-Smirnov 5% Critical Value	0.255					95% BCA Bootstrap UCL	0.867
3450				**Data follow Appr. Gamma Distribution at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1.049
3451										97.5% Chebyshev(Mean, Sd) UCL	1.16
3452				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	1.378
3453				95% Approximate Gamma UCL	0.933						
3454				95% Adjusted Gamma UCL	0.959						
3455											
3456				**Potential UCL to Use**						Use 95% Approximate Gamma UCL	0.933
3457											
3458											
3459	**Chromium, dissolved (mw-39-100)**										
3460											
3461				**General Statistics**							
3462				Number of Valid Observations	41					Number of Distinct Observations	39
3463											
3464				**Raw Statistics**						**Log-transformed Statistics**	
3465				Minimum	1.69					Minimum of Log Data	0.525
3466				Maximum	13.7					Maximum of Log Data	2.617
3467				Mean	5.565					Mean of log Data	1.538
3468				Median	3.95					SD of log Data	0.596
3469				SD	3.487						
3470				Coefficient of Variation	0.627						
3471				Skewness	0.949						
3472											
3473				**Relevant UCL Statistics**							
3474				**Normal Distribution Test**						**Lognormal Distribution Test**	
3475				Shapiro Wilk Test Statistic	0.836					Shapiro Wilk Test Statistic	0.922
3476				Shapiro Wilk Critical Value	0.941					Shapiro Wilk Critical Value	0.941
3477				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
3478											
3479				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3480				95% Student's-t UCL	6.482					95% H-UCL	6.698
3481				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	7.933
3482				95% Adjusted-CLT UCL	6.547					97.5% Chebyshev (MVUE) UCL	8.971
3483				95% Modified-t UCL	6.495					99% Chebyshev (MVUE) UCL	11.01
3484											
3485				**Gamma Distribution Test**						**Data Distribution**	
3486				k star (bias corrected)	2.762					**Data do not follow a Discernable Distribution (0.05)**	
3487				Theta Star	2.015						
3488				nu star	226.5						
3489				Approximate Chi Square Value (.05)	192.6					**Nonparametric Statistics**	
3490				Adjusted Level of Significance	0.0441					95% CLT UCL	6.461
3491				Adjusted Chi Square Value	191.5					95% Jackknife UCL	6.482
3492										95% Standard Bootstrap UCL	6.444
3493				Anderson-Darling Test Statistic	1.621					95% Bootstrap-t UCL	6.582
3494				Anderson-Darling 5% Critical Value	0.755					95% Hall's Bootstrap UCL	6.521
3495				Kolmogorov-Smirnov Test Statistic	0.195					95% Percentile Bootstrap UCL	6.48
3496				Kolmogorov-Smirnov 5% Critical Value	0.139					95% BCA Bootstrap UCL	6.53
3497				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	7.939
3498										97.5% Chebyshev(Mean, Sd) UCL	8.966

3499	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	10.98
3500				95% Approximate Gamma UCL	6.542							
3501				95% Adjusted Gamma UCL	6.581							
3502												
3503	**Potential UCL to Use**										Use 95% Chebyshev (Mean, Sd) UCL	7.939
3504												
3505												
3506	**Chromium, dissolved (mw-39-40)**											
3507												
3508	**General Statistics**											
3509				Number of Valid Data	21						Number of Detected Data	2
3510				Number of Distinct Detected Data	2						Number of Non-Detect Data	19
3511											Percent Non-Detects	90.48%
3512												
3513	**Raw Statistics**										**Log-transformed Statistics**	
3514				Minimum Detected	0.0014						Minimum Detected	-6.571
3515				Maximum Detected	0.0026						Maximum Detected	-5.952
3516				Mean of Detected	0.002						Mean of Detected	-6.262
3517				SD of Detected	0.0008485						SD of Detected	0.438
3518				Minimum Non-Detect	0.001						Minimum Non-Detect	-6.908
3519				Maximum Non-Detect	0.001						Maximum Non-Detect	-6.908
3520												
3521												
3522	**Warning: Data set has only 2 Distinct Detected Values.**											
3523	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
3524	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
3525												
3526	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
3527												
3528	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3529	**Those methods will return a 'N/A' value on your output display!**											
3530												
3531	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
3532	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
3533												
3534												
3535	**UCL Statistics**											
3536	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
3537				Shapiro Wilk Test Statistic	1						Shapiro Wilk Test Statistic	1
3538				5% Shapiro Wilk Critical Value	N/A						5% Shapiro Wilk Critical Value	N/A
3539	**Data not Normal at 5% Significance Level**										**Data not Lognormal at 5% Significance Level**	
3540												
3541	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
3542				DL/2 Substitution Method							DL/2 Substitution Method	
3543				Mean	0.0006429						Mean	-7.473
3544				SD	0.0004895						SD	0.415
3545				95% DL/2 (t) UCL	0.0008271						95% H-Stat (DL/2) UCL	0.000685
3546												
3547				Maximum Likelihood Estimate(MLE) Method	N/A						Log ROS Method	
3548	**MLE method failed to converge properly**										Mean in Log Scale	N/A
3549											SD in Log Scale	N/A
3550											Mean in Original Scale	N/A
3551											SD in Original Scale	N/A

3552											95% Percentile Bootstrap UCL	N/A
3553											95% BCA Bootstrap UCL	N/A
3554												
3555	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3556					k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**					
3557					Theta Star	N/A						
3558					nu star	N/A						
3559												
3560					A-D Test Statistic	0.359	**Nonparametric Statistics**					
3561					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
3562					K-S Test Statistic	N/A					Mean	0.00146
3563					5% K-S Critical Value	N/A					SD	0.0002556
3564	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	7.887E-05
3565											95% KM (t) UCL	0.00159
3566	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00159
3567					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	N/A
3568					Minimum	N/A					95% KM (bootstrap t) UCL	N/A
3569					Maximum	N/A					95% KM (BCA) UCL	N/A
3570					Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
3571					Median	N/A					95% KM (Chebyshev) UCL	0.0018
3572					SD	N/A					97.5% KM (Chebyshev) UCL	0.00195
3573					k star	N/A					99% KM (Chebyshev) UCL	0.00224
3574					Theta star	N/A						
3575					Nu star	N/A	**Potential UCLs to Use**					
3576					AppChi2	N/A					95% KM (t) UCL	0.00159
3577					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A
3578					95% Adjusted Gamma UCL	N/A						
3579	**Note: DL/2 is not a recommended method.**											
3580												
3581												
3582	**Chromium, dissolved (mw-39-50)**											
3583												
3584	**General Statistics**											
3585					Number of Valid Data	18	Number of Detected Data	13				
3586					Number of Distinct Detected Data	13	Number of Non-Detect Data	5				
3587							Percent Non-Detects	27.78%				
3588												
3589	**Raw Statistics**						**Log-transformed Statistics**					
3590					Minimum Detected	0.0047	Minimum Detected	-5.36				
3591					Maximum Detected	3.92	Maximum Detected	1.366				
3592					Mean of Detected	1.485	Mean of Detected	-0.52				
3593					SD of Detected	1.432	SD of Detected	1.947				
3594					Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908				
3595					Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908				
3596												
3597												
3598	**UCL Statistics**											
3599	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3600					Shapiro Wilk Test Statistic	0.872	Shapiro Wilk Test Statistic	0.866				
3601					5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866				
3602	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3603												
3604	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					

3605				DL/2 Substitution Method						DL/2 Substitution Method		
3606				Mean	1.073					Mean		-2.487
3607				SD	1.384					SD		3.651
3608				95% DL/2 (t) UCL	1.64					95% H-Stat (DL/2) UCL		3529
3609												
3610				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
3611				Mean	0.758					Mean in Log Scale		-1.698
3612				SD	1.724					SD in Log Scale		2.595
3613				95% MLE (t) UCL	1.465					Mean in Original Scale		1.076
3614				95% MLE (Tiku) UCL	1.494					SD in Original Scale		1.382
3615										95% Percentile Bootstrap UCL		1.604
3616										95% BCA Bootstrap UCL		1.661
3617												
3618	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
3619				k star (bias corrected)	0.563					**Data appear Normal at 5% Significance Level**		
3620				Theta Star	2.638							
3621				nu star	14.64							
3622												
3623				A-D Test Statistic	0.276					**Nonparametric Statistics**		
3624				5% A-D Critical Value	0.777					Kaplan-Meier (KM) Method		
3625				K-S Test Statistic	0.777					Mean		1.074
3626				5% K-S Critical Value	0.247					SD		1.344
3627	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.33
3628										95% KM (t) UCL		1.647
3629	**Assuming Gamma Distribution**									95% KM (z) UCL		1.616
3630				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1.632
3631				Minimum	1E-09					95% KM (bootstrap t) UCL		1.784
3632				Maximum	3.92					95% KM (BCA) UCL		1.701
3633				Mean	1.111					95% KM (Percentile Bootstrap) UCL		1.604
3634				Median	0.393					95% KM (Chebyshev) UCL		2.511
3635				SD	1.357					97.5% KM (Chebyshev) UCL		3.133
3636				k star	0.231					99% KM (Chebyshev) UCL		4.355
3637				Theta star	4.797							
3638				Nu star	8.334					**Potential UCLs to Use**		
3639				AppChi2	2.93					95% KM (t) UCL		1.647
3640				95% Gamma Approximate UCL	3.159					95% KM (Percentile Bootstrap) UCL		1.604
3641				95% Adjusted Gamma UCL	3.519							
3642	**Note: DL/2 is not a recommended method.**											
3643												
3644												
3645	**Chromium, dissolved (mw-39-60)**											
3646												
3647										**General Statistics**		
3648				Number of Valid Data	18					Number of Detected Data		16
3649				Number of Distinct Detected Data	16					Number of Non-Detect Data		2
3650										Percent Non-Detects		11.11%
3651												
3652	**Raw Statistics**									**Log-transformed Statistics**		
3653				Minimum Detected	0.0027					Minimum Detected		-5.915
3654				Maximum Detected	3.61					Maximum Detected		1.284
3655				Mean of Detected	1.641					Mean of Detected		-0.724
3656				SD of Detected	1.419					SD of Detected		2.458
3657				Minimum Non-Detect	0.001					Minimum Non-Detect		-6.908

3658				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
3659												
3660												
3661	**UCL Statistics**											
3662	**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**						
3663				Shapiro Wilk Test Statistic	0.872					Shapiro Wilk Test Statistic	0.793	
3664				5% Shapiro Wilk Critical Value	0.887					5% Shapiro Wilk Critical Value	0.887	
3665	**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**						
3666												
3667	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
3668				DL/2 Substitution Method						DL/2 Substitution Method		
3669				Mean	1.459					Mean	-1.488	
3670				SD	1.435					SD	3.206	
3671				95% DL/2 (t) UCL	2.047					95% H-Stat (DL/2) UCL	1839	
3672												
3673				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
3674				Mean	1.366					Mean in Log Scale	-1.292	
3675				SD	1.53					SD in Log Scale	2.845	
3676				95% MLE (t) UCL	1.993					Mean in Original Scale	1.459	
3677				95% MLE (Tiku) UCL	1.983					SD in Original Scale	1.435	
3678										95% Percentile Bootstrap UCL	2.016	
3679										95% BCA Bootstrap UCL	2.019	
3680												
3681	**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**						
3682				k star (bias corrected)	0.463	**Data Follow Appr. Gamma Distribution at 5% Significance Level**						
3683				Theta Star	3.548							
3684				nu star	14.8							
3685												
3686				A-D Test Statistic	0.963	**Nonparametric Statistics**						
3687				5% A-D Critical Value	0.795					Kaplan-Meier (KM) Method		
3688				K-S Test Statistic	0.795					Mean	1.459	
3689				5% K-S Critical Value	0.227					SD	1.394	
3690	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean	0.339	
3691										95% KM (t) UCL	2.05	
3692	**Assuming Gamma Distribution**									95% KM (z) UCL	2.018	
3693				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	2.048	
3694				Minimum	0.0027					95% KM (bootstrap t) UCL	2.089	
3695				Maximum	3.61					95% KM (BCA) UCL	2.02	
3696				Mean	1.479					95% KM (Percentile Bootstrap) UCL	1.996	
3697				Median	1.19					95% KM (Chebyshev) UCL	2.939	
3698				SD	1.415					97.5% KM (Chebyshev) UCL	3.579	
3699				k star	0.467					99% KM (Chebyshev) UCL	4.836	
3700				Theta star	3.169							
3701				Nu star	16.8	**Potential UCLs to Use**						
3702				AppChi2	8.531					95% KM (Chebyshev) UCL	2.939	
3703				95% Gamma Approximate UCL	2.913							
3704				95% Adjusted Gamma UCL	3.118							
3705	**Note: DL/2 is not a recommended method.**											
3706												
3707												
3708	**Chromium, dissolved (mw-39-70)**											
3709												
3710	**General Statistics**											

3711					Number of Valid Observations	28					Number of Distinct Observations	28
3712												
3713					**Raw Statistics**						**Log-transformed Statistics**	
3714					Minimum	0.0043					Minimum of Log Data	-5.449
3715					Maximum	8.49					Maximum of Log Data	2.139
3716					Mean	2.294					Mean of log Data	-0.794
3717					Median	0.458					SD of log Data	2.321
3718					SD	2.923						
3719					Coefficient of Variation	1.274						
3720					Skewness	0.874						
3721												
3722					**Relevant UCL Statistics**							
3723					**Normal Distribution Test**						**Lognormal Distribution Test**	
3724					Shapiro Wilk Test Statistic	0.74					Shapiro Wilk Test Statistic	0.912
3725					Shapiro Wilk Critical Value	0.924					Shapiro Wilk Critical Value	0.924
3726					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
3727												
3728					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3729					95% Student's-t UCL	3.235					95% H-UCL	47.5
3730					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	17.9
3731					95% Adjusted-CLT UCL	3.3					97.5% Chebyshev (MVUE) UCL	23.47
3732					95% Modified-t UCL	3.25					99% Chebyshev (MVUE) UCL	34.43
3733												
3734					**Gamma Distribution Test**						**Data Distribution**	
3735					k star (bias corrected)	0.385					**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
3736					Theta Star	5.963						
3737					nu star	21.55						
3738					Approximate Chi Square Value (.05)	12					**Nonparametric Statistics**	
3739					Adjusted Level of Significance	0.0404					95% CLT UCL	3.203
3740					Adjusted Chi Square Value	11.56					95% Jackknife UCL	3.235
3741											95% Standard Bootstrap UCL	3.169
3742					Anderson-Darling Test Statistic	1.149					95% Bootstrap-t UCL	3.351
3743					Anderson-Darling 5% Critical Value	0.831					95% Hall's Bootstrap UCL	3.267
3744					Kolmogorov-Smirnov Test Statistic	0.173					95% Percentile Bootstrap UCL	3.193
3745					Kolmogorov-Smirnov 5% Critical Value	0.177					95% BCA Bootstrap UCL	3.315
3746					**Data follow Appr. Gamma Distribution at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	4.702
3747											97.5% Chebyshev(Mean, Sd) UCL	5.744
3748					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	7.79
3749					95% Approximate Gamma UCL	4.12						
3750					95% Adjusted Gamma UCL	4.277						
3751												
3752					**Potential UCL to Use**						Use 95% Adjusted Gamma UCL	4.277
3753												
3754												
3755	**Chromium, dissolved (mw-39-80)**											
3756												
3757					**General Statistics**							
3758					Number of Valid Observations	40					Number of Distinct Observations	40
3759												
3760					**Raw Statistics**						**Log-transformed Statistics**	
3761					Minimum	0.0452					Minimum of Log Data	-3.097
3762					Maximum	12.9					Maximum of Log Data	2.557
3763					Mean	3.081					Mean of log Data	0.12

3764					Median	1.53					SD of log Data	1.719
3765					SD	3.613						
3766					Coefficient of Variation	1.173						
3767					Skewness	1.258						
3768												
3769					**Relevant UCL Statistics**							
3770					**Normal Distribution Test**						**Lognormal Distribution Test**	
3771					Shapiro Wilk Test Statistic	0.794					Shapiro Wilk Test Statistic	0.925
3772					Shapiro Wilk Critical Value	0.94					Shapiro Wilk Critical Value	0.94
3773					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
3774												
3775					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3776					95% Student's-t UCL	4.044					95% H-UCL	12.14
3777					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	11.85
3778					95% Adjusted-CLT UCL	4.142					97.5% Chebyshev (MVUE) UCL	15.01
3779					95% Modified-t UCL	4.063					99% Chebyshev (MVUE) UCL	21.22
3780												
3781					**Gamma Distribution Test**						**Data Distribution**	
3782					k star (bias corrected)	0.584					**Data appear Gamma Distributed at 5% Significance Level**	
3783					Theta Star	5.28						
3784					nu star	46.69						
3785					Approximate Chi Square Value (.05)	32.01					**Nonparametric Statistics**	
3786					Adjusted Level of Significance	0.044					95% CLT UCL	4.021
3787					Adjusted Chi Square Value	31.55					95% Jackknife UCL	4.044
3788											95% Standard Bootstrap UCL	3.997
3789					Anderson-Darling Test Statistic	0.489					95% Bootstrap-t UCL	4.19
3790					Anderson-Darling 5% Critical Value	0.802					95% Hall's Bootstrap UCL	4.138
3791					Kolmogorov-Smirnov Test Statistic	0.106					95% Percentile Bootstrap UCL	4.001
3792					Kolmogorov-Smirnov 5% Critical Value	0.146					95% BCA Bootstrap UCL	4.151
3793					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	5.571
3794											97.5% Chebyshev(Mean, Sd) UCL	6.649
3795					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	8.765
3796					95% Approximate Gamma UCL	4.494						
3797					95% Adjusted Gamma UCL	4.559						
3798												
3799					**Potential UCL to Use**						Use 95% Approximate Gamma UCL	4.494
3800												
3801												
3802	**Chromium, dissolved (mw-4)**											
3803												
3804					**General Statistics**							
3805					Number of Valid Observations	9					Number of Distinct Observations	9
3806												
3807					**Raw Statistics**						**Log-transformed Statistics**	
3808					Minimum	0.0187					Minimum of Log Data	-3.979
3809					Maximum	0.083					Maximum of Log Data	-2.489
3810					Mean	0.0344					Mean of log Data	-3.488
3811					Median	0.024					SD of log Data	0.482
3812					SD	0.0204						
3813					Coefficient of Variation	0.594						
3814					Skewness	1.993						
3815												
3816												

3817	**Warning: There are only 9 Values in this data**											
3818	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
3819	**the resulting calculations may not be reliable enough to draw conclusions**											
3820												
3821	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
3822												
3823	**Relevant UCL Statistics**											
3824	**Normal Distribution Test**						**Lognormal Distribution Test**					
3825				Shapiro Wilk Test Statistic	0.754					Shapiro Wilk Test Statistic	0.876	
3826				Shapiro Wilk Critical Value	0.829					Shapiro Wilk Critical Value	0.829	
3827	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3828												
3829	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3830				95% Student's-t UCL	0.0471					95% H-UCL	0.0501	
3831	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.0579	
3832				95% Adjusted-CLT UCL	0.0504					97.5% Chebyshev (MVUE) UCL	0.0683	
3833				95% Modified-t UCL	0.0478					99% Chebyshev (MVUE) UCL	0.0888	
3834												
3835	**Gamma Distribution Test**						**Data Distribution**					
3836				k star (bias corrected)	3.007		**Data appear Gamma Distributed at 5% Significance Level**					
3837				Theta Star	0.0114							
3838				nu star	54.13							
3839				Approximate Chi Square Value (.05)	38.22		**Nonparametric Statistics**					
3840				Adjusted Level of Significance	0.0231					95% CLT UCL	0.0456	
3841				Adjusted Chi Square Value	35.42					95% Jackknife UCL	0.0471	
3842										95% Standard Bootstrap UCL	0.0448	
3843				Anderson-Darling Test Statistic	0.649					95% Bootstrap-t UCL	0.0638	
3844				Anderson-Darling 5% Critical Value	0.724					95% Hall's Bootstrap UCL	0.0921	
3845				Kolmogorov-Smirnov Test Statistic	0.264					95% Percentile Bootstrap UCL	0.0457	
3846				Kolmogorov-Smirnov 5% Critical Value	0.28					95% BCA Bootstrap UCL	0.0514	
3847	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.0641	
3848										97.5% Chebyshev(Mean, Sd) UCL	0.077	
3849	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.102	
3850				95% Approximate Gamma UCL	0.0487							
3851				95% Adjusted Gamma UCL	0.0526							
3852												
3853	**Potential UCL to Use**									Use 95% Approximate Gamma UCL	0.0487	
3854												
3855												
3856	**Chromium, dissolved (mw-40d)**											
3857												
3858	**General Statistics**											
3859				Number of Valid Observations	15					Number of Distinct Observations	15	
3860												
3861	**Raw Statistics**						**Log-transformed Statistics**					
3862				Minimum	0.0064					Minimum of Log Data	-5.051	
3863				Maximum	0.104					Maximum of Log Data	-2.263	
3864				Mean	0.0646					Mean of log Data	-2.915	
3865				Median	0.0767					SD of log Data	0.737	
3866				SD	0.0298							
3867				Coefficient of Variation	0.461							
3868				Skewness	-0.569							
3869												

3870	**Relevant UCL Statistics**											
3871	**Normal Distribution Test**						**Lognormal Distribution Test**					
3872	Shapiro Wilk Test Statistic	0.92					Shapiro Wilk Test Statistic	0.777				
3873	Shapiro Wilk Critical Value	0.881					Shapiro Wilk Critical Value	0.881				
3874	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3875												
3876	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3877	95% Student's-t UCL	0.0781					95% H-UCL	0.113				
3878	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.131				
3879	95% Adjusted-CLT UCL	0.076					97.5% Chebyshev (MVUE) UCL	0.157				
3880	95% Modified-t UCL	0.0779					99% Chebyshev (MVUE) UCL	0.209				
3881												
3882	**Gamma Distribution Test**						**Data Distribution**					
3883	k star (bias corrected)	2.449					**Data appear Normal at 5% Significance Level**					
3884	Theta Star	0.0264										
3885	nu star	73.46										
3886	Approximate Chi Square Value (.05)	54.72					**Nonparametric Statistics**					
3887	Adjusted Level of Significance	0.0324					95% CLT UCL	0.0772				
3888	Adjusted Chi Square Value	52.73					95% Jackknife UCL	0.0781				
3889							95% Standard Bootstrap UCL	0.0767				
3890	Anderson-Darling Test Statistic	0.916					95% Bootstrap-t UCL	0.0765				
3891	Anderson-Darling 5% Critical Value	0.744					95% Hall's Bootstrap UCL	0.0762				
3892	Kolmogorov-Smirnov Test Statistic	0.234					95% Percentile Bootstrap UCL	0.0767				
3893	Kolmogorov-Smirnov 5% Critical Value	0.223					95% BCA Bootstrap UCL	0.0759				
3894	**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0981				
3895							97.5% Chebyshev(Mean, Sd) UCL	0.113				
3896	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.141				
3897	95% Approximate Gamma UCL	0.0867										
3898	95% Adjusted Gamma UCL	0.09										
3899												
3900	**Potential UCL to Use**						Use 95% Student's-t UCL	0.0781				
3901												
3902												
3903	**Chromium, dissolved (mw-40s)**											
3904												
3905	**General Statistics**											
3906	Number of Valid Observations	13					Number of Distinct Observations	11				
3907												
3908	**Raw Statistics**						**Log-transformed Statistics**					
3909	Minimum	0.0023					Minimum of Log Data	-6.075				
3910	Maximum	0.0078					Maximum of Log Data	-4.854				
3911	Mean	0.00538					Mean of log Data	-5.271				
3912	Median	0.0051					SD of log Data	0.327				
3913	SD	0.00157										
3914	Coefficient of Variation	0.292										
3915	Skewness	-0.0797										
3916												
3917	**Relevant UCL Statistics**											
3918	**Normal Distribution Test**						**Lognormal Distribution Test**					
3919	Shapiro Wilk Test Statistic	0.95					Shapiro Wilk Test Statistic	0.909				
3920	Shapiro Wilk Critical Value	0.866					Shapiro Wilk Critical Value	0.866				
3921	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3922												

3923	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3924				95% Student's-t UCL	0.00615					95% H-UCL	0.00651	
3925	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.00756	
3926				95% Adjusted-CLT UCL	0.00608					97.5% Chebyshev (MVUE) UCL	0.00849	
3927				95% Modified-t UCL	0.00615					99% Chebyshev (MVUE) UCL	0.0103	
3928												
3929	**Gamma Distribution Test**						**Data Distribution**					
3930				k star (bias corrected)	8.72		**Data appear Normal at 5% Significance Level**					
3931				Theta Star	0.0006166							
3932				nu star	226.7							
3933				Approximate Chi Square Value (.05)	192.9		**Nonparametric Statistics**					
3934				Adjusted Level of Significance	0.0301					95% CLT UCL	0.00609	
3935				Adjusted Chi Square Value	188.4					95% Jackknife UCL	0.00615	
3936										95% Standard Bootstrap UCL	0.00608	
3937				Anderson-Darling Test Statistic	0.366					95% Bootstrap-t UCL	0.00617	
3938				Anderson-Darling 5% Critical Value	0.734					95% Hall's Bootstrap UCL	0.00608	
3939				Kolmogorov-Smirnov Test Statistic	0.137					95% Percentile Bootstrap UCL	0.00611	
3940				Kolmogorov-Smirnov 5% Critical Value	0.237					95% BCA Bootstrap UCL	0.00603	
3941	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.00727	
3942										97.5% Chebyshev(Mean, Sd) UCL	0.00809	
3943	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.0097	
3944				95% Approximate Gamma UCL	0.00632							
3945				95% Adjusted Gamma UCL	0.00647							
3946												
3947	**Potential UCL to Use**									Use 95% Student's-t UCL	0.00615	
3948												
3949												
3950	**Chromium, dissolved (mw-41d)**											
3951												
3952	**General Statistics**											
3953				Number of Valid Data	11					Number of Detected Data	4	
3954				Number of Distinct Detected Data	4					Number of Non-Detect Data	7	
3955										Percent Non-Detects	63.64%	
3956												
3957	**Raw Statistics**						**Log-transformed Statistics**					
3958				Minimum Detected	0.0013					Minimum Detected	-6.645	
3959				Maximum Detected	0.0081					Maximum Detected	-4.816	
3960				Mean of Detected	0.0034					Mean of Detected	-5.978	
3961				SD of Detected	0.00321					SD of Detected	0.848	
3962				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
3963				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
3964												
3965												
3966	**Warning: There are only 4 Distinct Detected Values in this data**											
3967	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3968	**the resulting calculations may not be reliable enough tp draw conclusions**											
3969												
3970	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3971												
3972												
3973	**UCL Statistics**											
3974	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3975				Shapiro Wilk Test Statistic	0.78					Shapiro Wilk Test Statistic	0.874	

3976				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
3977	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3978												
3979	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3980				DL/2 Substitution Method						DL/2 Substitution Method		
3981				Mean	0.00155					Mean	-7.011	
3982				SD	0.00229					SD	0.942	
3983				95% DL/2 (t) UCL	0.0028					95% H-Stat (DL/2) UCL	0.0026	
3984												
3985				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3986	**MLE yields a negative mean**									Mean in Log Scale	-8	
3987										SD in Log Scale	1.894	
3988										Mean in Original Scale	0.00134	
3989										SD in Original Scale	0.0024	
3990										95% Percentile Bootstrap UCL	0.00257	
3991										95% BCA Bootstrap UCL	0.00327	
3992												
3993	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3994				k star (bias corrected)	0.63		**Data appear Normal at 5% Significance Level**					
3995				Theta Star	0.0054							
3996				nu star	5.037							
3997												
3998				A-D Test Statistic	0.459		**Nonparametric Statistics**					
3999				5% A-D Critical Value	0.661					Kaplan-Meier (KM) Method		
4000				K-S Test Statistic	0.661					Mean	0.00206	
4001				5% K-S Critical Value	0.398					SD	0.00196	
4002	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.000681	
4003										95% KM (t) UCL	0.0033	
4004	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00318	
4005				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00314	
4006				Minimum	0.0002655					95% KM (bootstrap t) UCL	0.005	
4007				Maximum	0.0181					95% KM (BCA) UCL	0.00425	
4008				Mean	0.00634					95% KM (Percentile Bootstrap) UCL	0.00376	
4009				Median	0.00427					95% KM (Chebyshev) UCL	0.00503	
4010				SD	0.00584					97.5% KM (Chebyshev) UCL	0.00632	
4011				k star	0.831					99% KM (Chebyshev) UCL	0.00884	
4012				Theta star	0.00763							
4013				Nu star	18.28		**Potential UCLs to Use**					
4014				AppChi2	9.591					95% KM (t) UCL	0.0033	
4015				95% Gamma Approximate UCL	0.0121					95% KM (Percentile Bootstrap) UCL	0.00376	
4016				95% Adjusted Gamma UCL	N/A							
4017	**Note: DL/2 is not a recommended method.**											
4018												
4019												
4020	**Chromium, dissolved (mw-41m)**											
4021												
4022	**General Statistics**											
4023				Number of Valid Observations	11					Number of Distinct Observations	11	
4024												
4025	**Raw Statistics**						**Log-transformed Statistics**					
4026				Minimum	0.0035					Minimum of Log Data	-5.655	
4027				Maximum	0.012					Maximum of Log Data	-4.423	
4028				Mean	0.0074					Mean of log Data	-4.969	

4029					Median	0.0074					SD of log Data	0.38
4030					SD	0.00266						
4031					Coefficient of Variation	0.36						
4032					Skewness	0.264						
4033												
4034					**Relevant UCL Statistics**							
4035					**Normal Distribution Test**						**Lognormal Distribution Test**	
4036					Shapiro Wilk Test Statistic	0.966					Shapiro Wilk Test Statistic	0.964
4037					Shapiro Wilk Critical Value	0.85					Shapiro Wilk Critical Value	0.85
4038					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
4039												
4040					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
4041					95% Student's-t UCL	0.00886					95% H-UCL	0.00954
4042					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0112
4043					95% Adjusted-CLT UCL	0.00879					97.5% Chebyshev (MVUE) UCL	0.0128
4044					95% Modified-t UCL	0.00887					99% Chebyshev (MVUE) UCL	0.016
4045												
4046					**Gamma Distribution Test**						**Data Distribution**	
4047					k star (bias corrected)	5.958					**Data appear Normal at 5% Significance Level**	
4048					Theta Star	0.00124						
4049					nu star	131.1						
4050					Approximate Chi Square Value (.05)	105.6					**Nonparametric Statistics**	
4051					Adjusted Level of Significance	0.0278					95% CLT UCL	0.00872
4052					Adjusted Chi Square Value	101.9					95% Jackknife UCL	0.00886
4053											95% Standard Bootstrap UCL	0.00866
4054					Anderson-Darling Test Statistic	0.216					95% Bootstrap-t UCL	0.00898
4055					Anderson-Darling 5% Critical Value	0.73					95% Hall's Bootstrap UCL	0.00877
4056					Kolmogorov-Smirnov Test Statistic	0.16					95% Percentile Bootstrap UCL	0.00875
4057					Kolmogorov-Smirnov 5% Critical Value	0.256					95% BCA Bootstrap UCL	0.00873
4058					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0109
4059											97.5% Chebyshev(Mean, Sd) UCL	0.0124
4060					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0154
4061					95% Approximate Gamma UCL	0.00918						
4062					95% Adjusted Gamma UCL	0.00952						
4063												
4064					**Potential UCL to Use**						Use 95% Student's-t UCL	0.00886
4065												
4066												
4067	**Chromium, dissolved (mw-41s)**											
4068												
4069					**General Statistics**							
4070					Number of Valid Observations	11					Number of Distinct Observations	10
4071												
4072					**Raw Statistics**						**Log-transformed Statistics**	
4073					Minimum	0.0073					Minimum of Log Data	-4.92
4074					Maximum	0.0209					Maximum of Log Data	-3.868
4075					Mean	0.0165					Mean of log Data	-4.143
4076					Median	0.018					SD of log Data	0.307
4077					SD	0.00397						
4078					Coefficient of Variation	0.241						
4079					Skewness	-1.557						
4080												
4081					**Relevant UCL Statistics**							

4082	**Normal Distribution Test**						**Lognormal Distribution Test**					
4083					Shapiro Wilk Test Statistic	0.823					Shapiro Wilk Test Statistic	0.738
4084					Shapiro Wilk Critical Value	0.85					Shapiro Wilk Critical Value	0.85
4085	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
4086												
4087	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
4088					95% Student's-t UCL	0.0186					95% H-UCL	0.0201
4089	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0233
4090					95% Adjusted-CLT UCL	0.0178					97.5% Chebyshev (MVUE) UCL	0.0262
4091					95% Modified-t UCL	0.0185					99% Chebyshev (MVUE) UCL	0.032
4092												
4093	**Gamma Distribution Test**						**Data Distribution**					
4094					k star (bias corrected)	10.18	**Data do not follow a Discernable Distribution (0.05)**					
4095					Theta Star	0.00162						
4096					nu star	224						
4097					Approximate Chi Square Value (.05)	190.4	**Nonparametric Statistics**					
4098					Adjusted Level of Significance	0.0278					95% CLT UCL	0.0184
4099					Adjusted Chi Square Value	185.3					95% Jackknife UCL	0.0186
4100											95% Standard Bootstrap UCL	0.0183
4101					Anderson-Darling Test Statistic	1.174					95% Bootstrap-t UCL	0.0181
4102					Anderson-Darling 5% Critical Value	0.729					95% Hall's Bootstrap UCL	0.0179
4103					Kolmogorov-Smirnov Test Statistic	0.278					95% Percentile Bootstrap UCL	0.0182
4104					Kolmogorov-Smirnov 5% Critical Value	0.255					95% BCA Bootstrap UCL	0.018
4105	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.0217
4106											97.5% Chebyshev(Mean, Sd) UCL	0.0239
4107	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.0284
4108					95% Approximate Gamma UCL	0.0194						
4109					95% Adjusted Gamma UCL	0.0199						
4110												
4111	**Potential UCL to Use**										Use 95% Student's-t UCL	0.0186
4112											or 95% Modified-t UCL	0.0185
4113												
4114												
4115	**Chromium, dissolved (mw-42-30)**											
4116												
4117	**General Statistics**											
4118					Number of Valid Data	9					Number of Detected Data	0
4119					Number of Distinct Detected Data	0					Number of Non-Detect Data	9
4120											Percent Non-Detects	100.00%
4121												
4122	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
4123	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
4124	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
4125												
4126	**The data set for variable Chromium, dissolved (mw-42-30) was not processed!**											
4127												
4128												
4129												
4130	**Chromium, dissolved (mw-42-55)**											
4131												
4132	**General Statistics**											
4133					Number of Valid Data	12					Number of Detected Data	0
4134					Number of Distinct Detected Data	0					Number of Non-Detect Data	12

4135											Percent Non-Detects	100.00%
4136												
4137	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
4138	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
4139	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
4140												
4141	The data set for variable Chromium, dissolved (mw-42-55) was not processed!											
4142												
4143												
4144												
4145	Chromium, dissolved (mw-42-65)											
4146												
4147	General Statistics											
4148						Number of Valid Data	12				Number of Detected Data	0
4149						Number of Distinct Detected Data	0				Number of Non-Detect Data	12
4150											Percent Non-Detects	100.00%
4151												
4152	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
4153	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
4154	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
4155												
4156	The data set for variable Chromium, dissolved (mw-42-65) was not processed!											
4157												
4158												
4159												
4160	Chromium, dissolved (mw-43-25)											
4161												
4162	General Statistics											
4163						Number of Valid Data	13				Number of Detected Data	1
4164						Number of Distinct Detected Data	1				Number of Non-Detect Data	12
4165											Percent Non-Detects	92.31%
4166												
4167	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
4168	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
4169												
4170	The data set for variable Chromium, dissolved (mw-43-25) was not processed!											
4171												
4172												
4173												
4174	Chromium, dissolved (mw-43-75)											
4175												
4176	General Statistics											
4177						Number of Valid Data	19				Number of Detected Data	1
4178						Number of Distinct Detected Data	1				Number of Non-Detect Data	18
4179											Percent Non-Detects	94.74%
4180												
4181	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
4182	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
4183												
4184	The data set for variable Chromium, dissolved (mw-43-75) was not processed!											
4185												
4186												
4187												

4188	**Chromium, dissolved (mw-43-90)**											
4189												
4190	**General Statistics**											
4191						Number of Valid Data	19			Number of Detected Data		0
4192						Number of Distinct Detected Data	0			Number of Non-Detect Data		19
4193										Percent Non-Detects		100.00%
4194												
4195	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
4196	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
4197	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
4198												
4199	**The data set for variable Chromium, dissolved (mw-43-90) was not processed!**											
4200												
4201												
4202												
4203	**Chromium, dissolved (mw-44-115)**											
4204												
4205	**General Statistics**											
4206						Number of Valid Observations	34			Number of Distinct Observations		33
4207												
4208	**Raw Statistics**									**Log-transformed Statistics**		
4209						Minimum	0.59			Minimum of Log Data		-0.528
4210						Maximum	1.97			Maximum of Log Data		0.678
4211						Mean	1.302			Mean of log Data		0.219
4212						Median	1.345			SD of log Data		0.316
4213						SD	0.365					
4214						Coefficient of Variation	0.281					
4215						Skewness	-0.231					
4216												
4217	**Relevant UCL Statistics**											
4218	**Normal Distribution Test**									**Lognormal Distribution Test**		
4219						Shapiro Wilk Test Statistic	0.969			Shapiro Wilk Test Statistic		0.925
4220						Shapiro Wilk Critical Value	0.933			Shapiro Wilk Critical Value		0.933
4221	**Data appear Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**		
4222												
4223	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
4224						95% Student's-t UCL	1.408			95% H-UCL		1.445
4225	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL		1.621
4226						95% Adjusted-CLT UCL	1.402			97.5% Chebyshev (MVUE) UCL		1.757
4227						95% Modified-t UCL	1.407			99% Chebyshev (MVUE) UCL		2.024
4228												
4229	**Gamma Distribution Test**									**Data Distribution**		
4230						k star (bias corrected)	10.46			**Data appear Normal at 5% Significance Level**		
4231						Theta Star	0.124					
4232						nu star	711.4					
4233						Approximate Chi Square Value (.05)	650.5			**Nonparametric Statistics**		
4234						Adjusted Level of Significance	0.0422			95% CLT UCL		1.405
4235						Adjusted Chi Square Value	647.6			95% Jackknife UCL		1.408
4236										95% Standard Bootstrap UCL		1.404
4237						Anderson-Darling Test Statistic	0.581			95% Bootstrap-t UCL		1.405
4238						Anderson-Darling 5% Critical Value	0.747			95% Hall's Bootstrap UCL		1.401
4239						Kolmogorov-Smirnov Test Statistic	0.137			95% Percentile Bootstrap UCL		1.407
4240						Kolmogorov-Smirnov 5% Critical Value	0.151			95% BCA Bootstrap UCL		1.399

4241	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		1.575
4242										97.5% Chebyshev(Mean, Sd) UCL		1.693
4243	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		1.925
4244					95% Approximate Gamma UCL	1.424						
4245					95% Adjusted Gamma UCL	1.43						
4246												
4247	Potential UCL to Use									Use 95% Student's-t UCL		1.408
4248												
4249												
4250	Chromium, dissolved (mw-44-125)											
4251												
4252	General Statistics											
4253					Number of Valid Observations	29				Number of Distinct Observations		29
4254												
4255	Raw Statistics						Log-transformed Statistics					
4256					Minimum	0.18				Minimum of Log Data		-1.715
4257					Maximum	0.74				Maximum of Log Data		-0.301
4258					Mean	0.361				Mean of log Data		-1.081
4259					Median	0.321				SD of log Data		0.35
4260					SD	0.138						
4261					Coefficient of Variation	0.382						
4262					Skewness	1.248						
4263												
4264	Relevant UCL Statistics											
4265	Normal Distribution Test						Lognormal Distribution Test					
4266					Shapiro Wilk Test Statistic	0.885				Shapiro Wilk Test Statistic		0.964
4267					Shapiro Wilk Critical Value	0.926				Shapiro Wilk Critical Value		0.926
4268	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
4269												
4270	Assuming Normal Distribution						Assuming Lognormal Distribution					
4271					95% Student's-t UCL	0.405				95% H-UCL		0.407
4272	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL		0.464
4273					95% Adjusted-CLT UCL	0.41				97.5% Chebyshev (MVUE) UCL		0.509
4274					95% Modified-t UCL	0.406				99% Chebyshev (MVUE) UCL		0.598
4275												
4276	Gamma Distribution Test						Data Distribution					
4277					k star (bias corrected)	7.399	Data appear Gamma Distributed at 5% Significance Level					
4278					Theta Star	0.0488						
4279					nu star	429.1						
4280					Approximate Chi Square Value (.05)	382.1	Nonparametric Statistics					
4281					Adjusted Level of Significance	0.0407				95% CLT UCL		0.403
4282					Adjusted Chi Square Value	379.5				95% Jackknife UCL		0.405
4283										95% Standard Bootstrap UCL		0.402
4284					Anderson-Darling Test Statistic	0.628				95% Bootstrap-t UCL		0.415
4285					Anderson-Darling 5% Critical Value	0.746				95% Hall's Bootstrap UCL		0.41
4286					Kolmogorov-Smirnov Test Statistic	0.119				95% Percentile Bootstrap UCL		0.402
4287					Kolmogorov-Smirnov 5% Critical Value	0.163				95% BCA Bootstrap UCL		0.413
4288	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		0.473
4289										97.5% Chebyshev(Mean, Sd) UCL		0.521
4290	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		0.616
4291					95% Approximate Gamma UCL	0.406						
4292					95% Adjusted Gamma UCL	0.408						
4293												

4294	**Potential UCL to Use**						Use 95% Approximate Gamma UCL					0.406
4295												
4296												
4297	**Chromium, dissolved (mw-44-70)**											
4298												
4299	**General Statistics**											
4300	Number of Valid Data				12		Number of Detected Data					0
4301	Number of Distinct Detected Data				0		Number of Non-Detect Data					12
4302							Percent Non-Detects					100.00%
4303												
4304	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
4305	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
4306	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
4307												
4308	**The data set for variable Chromium, dissolved (mw-44-70) was not processed!**											
4309												
4310												
4311												
4312	**Chromium, dissolved (mw-45-095a)**											
4313												
4314	**General Statistics**											
4315	Number of Valid Observations				3		Number of Distinct Observations					3
4316												
4317												
4318	**Warning: This data set only has 3 observations!**											
4319	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4320	**The data set for variable Chromium, dissolved (mw-45-095a) was not processed!**											
4321												
4322	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4323	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4324												
4325												
4326												
4327	**Chromium, dissolved (mw-46-175)**											
4328												
4329	**General Statistics**											
4330	Number of Valid Observations				29		Number of Distinct Observations					28
4331												
4332	**Raw Statistics**						**Log-transformed Statistics**					
4333	Minimum				0.0747		Minimum of Log Data					-2.594
4334	Maximum				0.279		Maximum of Log Data					-1.277
4335	Mean				0.161		Mean of log Data					-1.895
4336	Median				0.164		SD of log Data					0.384
4337	SD				0.0598							
4338	Coefficient of Variation				0.371							
4339	Skewness				0.378							
4340												
4341	**Relevant UCL Statistics**											
4342	**Normal Distribution Test**						**Lognormal Distribution Test**					
4343	Shapiro Wilk Test Statistic				0.942		Shapiro Wilk Test Statistic					0.952
4344	Shapiro Wilk Critical Value				0.926		Shapiro Wilk Critical Value					0.926
4345	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
4346												

	A	B	C	D	E	F	G	H	I	J	K	L
4347	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
4348					95% Student's-t UCL	0.18					95% H-UCL	0.185
4349	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.213
4350					95% Adjusted-CLT UCL	0.18					97.5% Chebyshev (MVUE) UCL	0.235
4351					95% Modified-t UCL	0.18					99% Chebyshev (MVUE) UCL	0.279
4352												
4353	**Gamma Distribution Test**						**Data Distribution**					
4354					k star (bias corrected)	6.652	**Data appear Normal at 5% Significance Level**					
4355					Theta Star	0.0242						
4356					nu star	385.8						
4357					Approximate Chi Square Value (.05)	341.3	**Nonparametric Statistics**					
4358					Adjusted Level of Significance	0.0407					95% CLT UCL	0.179
4359					Adjusted Chi Square Value	338.8					95% Jackknife UCL	0.18
4360											95% Standard Bootstrap UCL	0.179
4361					Anderson-Darling Test Statistic	0.418					95% Bootstrap-t UCL	0.18
4362					Anderson-Darling 5% Critical Value	0.747					95% Hall's Bootstrap UCL	0.18
4363					Kolmogorov-Smirnov Test Statistic	0.122					95% Percentile Bootstrap UCL	0.179
4364					Kolmogorov-Smirnov 5% Critical Value	0.163					95% BCA Bootstrap UCL	0.181
4365	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.209
4366											97.5% Chebyshev(Mean, Sd) UCL	0.23
4367	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.272
4368					95% Approximate Gamma UCL	0.182						
4369					95% Adjusted Gamma UCL	0.183						
4370												
4371	**Potential UCL to Use**										Use 95% Student's-t UCL	0.18
4372												
4373												
4374	**Chromium, dissolved (mw-46-205)**											
4375												
4376					**General Statistics**							
4377					Number of Valid Data	14					Number of Detected Data	9
4378					Number of Distinct Detected Data	8					Number of Non-Detect Data	5
4379											Percent Non-Detects	35.71%
4380												
4381	**Raw Statistics**						**Log-transformed Statistics**					
4382					Minimum Detected	0.0018					Minimum Detected	-6.32
4383					Maximum Detected	0.0054					Maximum Detected	-5.221
4384					Mean of Detected	0.00336					Mean of Detected	-5.753
4385					SD of Detected	0.00119					SD of Detected	0.362
4386					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
4387					Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908
4388												
4389												
4390	**Warning: There are only 9 Detected Values in this data**											
4391	**Note: It should be noted that even though bootstrap may be performed on this data set**											
4392	**the resulting calculations may not be reliable enough tp draw conclusions**											
4393												
4394	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
4395												
4396												
4397	**UCL Statistics**											
4398	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
4399					Shapiro Wilk Test Statistic	0.955					Shapiro Wilk Test Statistic	0.969

4400				5% Shapiro Wilk Critical Value	0.829					5% Shapiro Wilk Critical Value	0.829
4401	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
4402												
4403	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
4404				DL/2 Substitution Method						DL/2 Substitution Method	
4405				Mean	0.00234					Mean	-6.413
4406				SD	0.0017					SD	0.962
4407				95% DL/2 (t) UCL	0.00315					95% H-Stat (DL/2) UCL	0.00489
4408											
4409				Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
4410				Mean	0.00204					Mean in Log Scale	-6.093
4411				SD	0.0021					SD in Log Scale	0.57
4412				95% MLE (t) UCL	0.00303					Mean in Original Scale	0.00261
4413				95% MLE (Tiku) UCL	0.00314					SD in Original Scale	0.00141
4414										95% Percentile Bootstrap UCL	0.00324
4415										95% BCA Bootstrap UCL	0.00325
4416											
4417	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
4418				k star (bias corrected)	6.012		**Data appear Normal at 5% Significance Level**					
4419				Theta Star	0.0005591							
4420				nu star	108.2							
4421												
4422				A-D Test Statistic	0.209		**Nonparametric Statistics**					
4423				5% A-D Critical Value	0.722					Kaplan-Meier (KM) Method	
4424				K-S Test Statistic	0.722					Mean	0.0028
4425				5% K-S Critical Value	0.279					SD	0.00117
4426	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.0003322
4427										95% KM (t) UCL	0.00339
4428	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00335
4429				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00334
4430				Minimum	0.0014					95% KM (bootstrap t) UCL	0.00354
4431				Maximum	0.0054					95% KM (BCA) UCL	0.0036
4432				Mean	0.00307					95% KM (Percentile Bootstrap) UCL	0.00349
4433				Median	0.00304					95% KM (Chebyshev) UCL	0.00425
4434				SD	0.00111					97.5% KM (Chebyshev) UCL	0.00488
4435				k star	6.547					99% KM (Chebyshev) UCL	0.00611
4436				Theta star	0.0004691						
4437				Nu star	183.3		**Potential UCLs to Use**					
4438				AppChi2	153					95% KM (t) UCL	0.00339
4439				95% Gamma Approximate UCL	0.00368					95% KM (Percentile Bootstrap) UCL	0.00349
4440				95% Adjusted Gamma UCL	0.00377						
4441	**Note: DL/2 is not a recommended method.**											
4442												
4443												
4444	**Chromium, dissolved (mw-47-115)**											
4445												
4446	**General Statistics**											
4447				Number of Valid Data	8					Number of Detected Data	7
4448				Number of Distinct Detected Data	7					Number of Non-Detect Data	1
4449										Percent Non-Detects	12.50%
4450											
4451	**Raw Statistics**						**Log-transformed Statistics**					
4452				Minimum Detected	0.0051					Minimum Detected	-5.279

4453				Maximum Detected	0.0183					Maximum Detected	-4.001	
4454				Mean of Detected	0.0103					Mean of Detected	-4.662	
4455				SD of Detected	0.00468					SD of Detected	0.464	
4456				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
4457				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
4458												
4459												
4460	**Warning: There are only 7 Detected Values in this data**											
4461	**Note: It should be noted that even though bootstrap may be performed on this data set**											
4462	**the resulting calculations may not be reliable enough tp draw conclusions**											
4463												
4464	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
4465												
4466												
4467	**UCL Statistics**											
4468	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
4469				Shapiro Wilk Test Statistic	0.931					Shapiro Wilk Test Statistic	0.946	
4470				5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803	
4471	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
4472												
4473	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
4474				DL/2 Substitution Method						DL/2 Substitution Method		
4475				Mean	0.00911					Mean	-5.029	
4476				SD	0.00556					SD	1.124	
4477				95% DL/2 (t) UCL	0.0128					95% H-Stat (DL/2) UCL	0.0603	
4478												
4479				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
4480				Mean	0.00885					Mean in Log Scale	-4.806	
4481				SD	0.00572					SD in Log Scale	0.593	
4482				95% MLE (t) UCL	0.0127					Mean in Original Scale	0.00942	
4483				95% MLE (Tiku) UCL	0.0128					SD in Original Scale	0.00506	
4484										95% Percentile Bootstrap UCL	0.0121	
4485										95% BCA Bootstrap UCL	0.0124	
4486												
4487	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
4488				k star (bias corrected)	3.351		**Data appear Normal at 5% Significance Level**					
4489				Theta Star	0.00309							
4490				nu star	46.92							
4491												
4492				A-D Test Statistic	0.289		**Nonparametric Statistics**					
4493				5% A-D Critical Value	0.71					Kaplan-Meier (KM) Method		
4494				K-S Test Statistic	0.71					Mean	0.00969	
4495				5% K-S Critical Value	0.313					SD	0.00441	
4496	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00168	
4497										95% KM (t) UCL	0.0129	
4498	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0125	
4499				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0128	
4500				Minimum	0.00279					95% KM (bootstrap t) UCL	0.0135	
4501				Maximum	0.0183					95% KM (BCA) UCL	0.0125	
4502				Mean	0.0094					95% KM (Percentile Bootstrap) UCL	0.0125	
4503				Median	0.00885					95% KM (Chebyshev) UCL	0.017	
4504				SD	0.00509					97.5% KM (Chebyshev) UCL	0.0202	
4505				k star	2.308					99% KM (Chebyshev) UCL	0.0264	

4506					Theta star	0.00407						
4507					Nu star	36.93	**Potential UCLs to Use**					
4508					AppChi2	24.02					95% KM (t) UCL	0.0129
4509				95% Gamma Approximate UCL		0.0145					95% KM (Percentile Bootstrap) UCL	0.0125
4510				95% Adjusted Gamma UCL		0.0162						
4511	**Note: DL/2 is not a recommended method.**											
4512												
4513												
4514	**Chromium, dissolved (mw-47-55)**											
4515												
4516	**General Statistics**											
4517				Number of Valid Observations		8					Number of Distinct Observations	8
4518												
4519	**Raw Statistics**						**Log-transformed Statistics**					
4520					Minimum	0.0079					Minimum of Log Data	-4.841
4521					Maximum	0.082					Maximum of Log Data	-2.501
4522					Mean	0.0438					Mean of log Data	-3.306
4523					Median	0.0429					SD of log Data	0.725
4524					SD	0.0232						
4525					Coefficient of Variation	0.531						
4526					Skewness	0.126						
4527												
4528												
4529	**Warning: There are only 8 Values in this data**											
4530	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
4531	**the resulting calculations may not be reliable enough to draw conclusions**											
4532												
4533	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
4534												
4535	**Relevant UCL Statistics**											
4536	**Normal Distribution Test**						**Lognormal Distribution Test**					
4537					Shapiro Wilk Test Statistic	0.967					Shapiro Wilk Test Statistic	0.87
4538					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
4539	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
4540												
4541	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
4542					95% Student's-t UCL	0.0594					95% H-UCL	0.102
4543	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.098
4544					95% Adjusted-CLT UCL	0.0577					97.5% Chebyshev (MVUE) UCL	0.121
4545					95% Modified-t UCL	0.0594					99% Chebyshev (MVUE) UCL	0.165
4546												
4547	**Gamma Distribution Test**						**Data Distribution**					
4548					k star (bias corrected)	1.932	**Data appear Normal at 5% Significance Level**					
4549					Theta Star	0.0227						
4550					nu star	30.91						
4551					Approximate Chi Square Value (.05)	19.21	**Nonparametric Statistics**					
4552					Adjusted Level of Significance	0.0195					95% CLT UCL	0.0573
4553					Adjusted Chi Square Value	16.92					95% Jackknife UCL	0.0594
4554											95% Standard Bootstrap UCL	0.0566
4555					Anderson-Darling Test Statistic	0.357					95% Bootstrap-t UCL	0.0592
4556					Anderson-Darling 5% Critical Value	0.722					95% Hall's Bootstrap UCL	0.0593
4557					Kolmogorov-Smirnov Test Statistic	0.202					95% Percentile Bootstrap UCL	0.0569
4558					Kolmogorov-Smirnov 5% Critical Value	0.296					95% BCA Bootstrap UCL	0.0568

4559	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		0.0796
4560										97.5% Chebyshev(Mean, Sd) UCL		0.0951
4561	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		0.126
4562				95% Approximate Gamma UCL	0.0705							
4563				95% Adjusted Gamma UCL	0.08							
4564												
4565	Potential UCL to Use									Use 95% Student's-t UCL		0.0594
4566												
4567												
4568	Chromium, dissolved (mw-48)											
4569												
4570	General Statistics											
4571				Number of Valid Data	10					Number of Detected Data		4
4572				Number of Distinct Detected Data	4					Number of Non-Detect Data		6
4573										Percent Non-Detects		60.00%
4574												
4575	Raw Statistics									Log-transformed Statistics		
4576				Minimum Detected	0.001					Minimum Detected		-6.908
4577				Maximum Detected	0.00293					Maximum Detected		-5.833
4578				Mean of Detected	0.00161					Mean of Detected		-6.531
4579				SD of Detected	0.0008979					SD of Detected		0.487
4580				Minimum Non-Detect	0.001					Minimum Non-Detect		-6.908
4581				Maximum Non-Detect	0.001					Maximum Non-Detect		-6.908
4582												
4583												
4584	Warning: There are only 4 Distinct Detected Values in this data											
4585	Note: It should be noted that even though bootstrap may be performed on this data set											
4586	the resulting calculations may not be reliable enough tp draw conclusions											
4587												
4588	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
4589												
4590												
4591	UCL Statistics											
4592	Normal Distribution Test with Detected Values Only									Lognormal Distribution Test with Detected Values Only		
4593				Shapiro Wilk Test Statistic	0.784					Shapiro Wilk Test Statistic		0.855
4594				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value		0.748
4595	Data appear Normal at 5% Significance Level									Data appear Lognormal at 5% Significance Level		
4596												
4597	Assuming Normal Distribution									Assuming Lognormal Distribution		
4598				DL/2 Substitution Method						DL/2 Substitution Method		
4599				Mean	0.000943					Mean		-7.173
4600				SD	0.0007719					SD		0.62
4601				95% DL/2 (t) UCL	0.00139					95% H-Stat (DL/2) UCL		0.00153
4602												
4603				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
4604				Mean	0.0006293					Mean in Log Scale		-7.561
4605				SD	0.00109					SD in Log Scale		1.031
4606				95% MLE (t) UCL	0.00126					Mean in Original Scale		0.0008233
4607				95% MLE (Tiku) UCL	0.00154					SD in Original Scale		0.0008595
4608										95% Percentile Bootstrap UCL		0.00128
4609										95% BCA Bootstrap UCL		0.00146
4610												
4611	Gamma Distribution Test with Detected Values Only									Data Distribution Test with Detected Values Only		

4612				k star (bias corrected)	1.483	**Data appear Normal at 5% Significance Level**						
4613				Theta Star	0.00108							
4614				nu star	11.86							
4615												
4616				A-D Test Statistic	0.5	**Nonparametric Statistics**						
4617				5% A-D Critical Value	0.659	Kaplan-Meier (KM) Method						
4618				K-S Test Statistic	0.659	Mean	0.00124					
4619				5% K-S Critical Value	0.396	SD	0.0005748					
4620	**Data appear Gamma Distributed at 5% Significance Level**					SE of Mean	0.0002099					
4621						95% KM (t) UCL	0.00163					
4622	**Assuming Gamma Distribution**					95% KM (z) UCL	0.00159					
4623	Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.00157					
4624				Minimum	0.0006836	95% KM (bootstrap t) UCL	0.00216					
4625				Maximum	0.00343	95% KM (BCA) UCL	0.00293					
4626				Mean	0.00192	95% KM (Percentile Bootstrap) UCL	0.00171					
4627				Median	0.00167	95% KM (Chebyshev) UCL	0.00216					
4628				SD	0.00096	97.5% KM (Chebyshev) UCL	0.00255					
4629				k star	2.997	99% KM (Chebyshev) UCL	0.00333					
4630				Theta star	0.000642							
4631				Nu star	59.94	**Potential UCLs to Use**						
4632				AppChi2	43.14	95% KM (t) UCL	0.00163					
4633				95% Gamma Approximate UCL	0.00267	95% KM (Percentile Bootstrap) UCL	0.00171					
4634				95% Adjusted Gamma UCL	N/A							
4635	**Note: DL/2 is not a recommended method.**											
4636												
4637												
4638	**Chromium, dissolved (mw-49-135)**											
4639												
4640	**General Statistics**											
4641				Number of Valid Data	7	Number of Detected Data	1					
4642				Number of Distinct Detected Data	1	Number of Non-Detect Data	6					
4643						Percent Non-Detects	85.71%					
4644												
4645	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
4646	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
4647												
4648	**The data set for variable Chromium, dissolved (mw-49-135) was not processed!**											
4649												
4650												
4651												
4652	**Chromium, dissolved (mw-49-275)**											
4653												
4654	**General Statistics**											
4655				Number of Valid Data	7	Number of Detected Data	0					
4656				Number of Distinct Detected Data	0	Number of Non-Detect Data	7					
4657						Percent Non-Detects	100.00%					
4658												
4659	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
4660	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
4661	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
4662												
4663	**The data set for variable Chromium, dissolved (mw-49-275) was not processed!**											
4664												

4665												
4666												
4667	**Chromium, dissolved (mw-49-365)**											
4668												
4669						**General Statistics**						
4670						Number of Valid Data	7			Number of Detected Data		1
4671						Number of Distinct Detected Data	1			Number of Non-Detect Data		6
4672										Percent Non-Detects		85.71%
4673												
4674						**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**						
4675						**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**						
4676												
4677						**The data set for variable Chromium, dissolved (mw-49-365) was not processed!**						
4678												
4679												
4680												
4681	**Chromium, dissolved (mw-5)**											
4682												
4683						**General Statistics**						
4684						Number of Valid Observations	9			Number of Distinct Observations		9
4685												
4686						**Raw Statistics**				**Log-transformed Statistics**		
4687						Minimum	0.0117			Minimum of Log Data		-4.448
4688						Maximum	0.15			Maximum of Log Data		-1.897
4689						Mean	0.0378			Mean of log Data		-3.695
4690						Median	0.017			SD of log Data		0.861
4691						SD	0.0459					
4692						Coefficient of Variation	1.212					
4693						Skewness	2.293					
4694												
4695												
4696						**Warning: There are only 9 Values in this data**						
4697						**Note: It should be noted that even though bootstrap methods may be performed on this data set,**						
4698						**the resulting calculations may not be reliable enough to draw conclusions**						
4699												
4700						**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**						
4701												
4702						**Relevant UCL Statistics**						
4703						**Normal Distribution Test**				**Lognormal Distribution Test**		
4704						Shapiro Wilk Test Statistic	0.627			Shapiro Wilk Test Statistic		0.803
4705						Shapiro Wilk Critical Value	0.829			Shapiro Wilk Critical Value		0.829
4706						**Data not Normal at 5% Significance Level**				**Data not Lognormal at 5% Significance Level**		
4707												
4708						**Assuming Normal Distribution**				**Assuming Lognormal Distribution**		
4709						95% Student's-t UCL	0.0663			95% H-UCL		0.0881
4710						**95% UCLs (Adjusted for Skewness)**				95% Chebyshev (MVUE) UCL		0.0783
4711						95% Adjusted-CLT UCL	0.0755			97.5% Chebyshev (MVUE) UCL		0.0974
4712						95% Modified-t UCL	0.0682			99% Chebyshev (MVUE) UCL		0.135
4713												
4714						**Gamma Distribution Test**				**Data Distribution**		
4715						k star (bias corrected)	0.962			**Data do not follow a Discernable Distribution (0.05)**		
4716						Theta Star	0.0394					
4717						nu star	17.31					

4718					Approximate Chi Square Value (.05)	8.893		**Nonparametric Statistics**				
4719					Adjusted Level of Significance	0.0231					95% CLT UCL	0.063
4720					Adjusted Chi Square Value	7.655					95% Jackknife UCL	0.0663
4721											95% Standard Bootstrap UCL	0.0619
4722					Anderson-Darling Test Statistic	1.128					95% Bootstrap-t UCL	0.258
4723					Anderson-Darling 5% Critical Value	0.737					95% Hall's Bootstrap UCL	0.193
4724					Kolmogorov-Smirnov Test Statistic	0.352					95% Percentile Bootstrap UCL	0.0645
4725					Kolmogorov-Smirnov 5% Critical Value	0.285					95% BCA Bootstrap UCL	0.0768
4726					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.104
4727											97.5% Chebyshev(Mean, Sd) UCL	0.133
4728					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.19
4729					95% Approximate Gamma UCL	0.0737						
4730					95% Adjusted Gamma UCL	0.0856						
4731												
4732					**Potential UCL to Use**			Use 95% Chebyshev (Mean, Sd) UCL				0.104
4733												
4734												
4735	**Chromium, dissolved (mw-50-095)**											
4736												
4737					**General Statistics**							
4738					Number of Valid Observations	8		Number of Distinct Observations				8
4739												
4740					**Raw Statistics**			**Log-transformed Statistics**				
4741					Minimum	0.192		Minimum of Log Data				-1.65
4742					Maximum	0.372		Maximum of Log Data				-0.989
4743					Mean	0.25		Mean of log Data				-1.41
4744					Median	0.242		SD of log Data				0.22
4745					SD	0.0591						
4746					Coefficient of Variation	0.237						
4747					Skewness	1.314						
4748												
4749												
4750					**Warning: There are only 8 Values in this data**							
4751					**Note: It should be noted that even though bootstrap methods may be performed on this data set,**							
4752					**the resulting calculations may not be reliable enough to draw conclusions**							
4753												
4754					**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**							
4755												
4756					**Relevant UCL Statistics**							
4757					**Normal Distribution Test**			**Lognormal Distribution Test**				
4758					Shapiro Wilk Test Statistic	0.87		Shapiro Wilk Test Statistic				0.914
4759					Shapiro Wilk Critical Value	0.818		Shapiro Wilk Critical Value				0.818
4760					**Data appear Normal at 5% Significance Level**			**Data appear Lognormal at 5% Significance Level**				
4761												
4762					**Assuming Normal Distribution**			**Assuming Lognormal Distribution**				
4763					95% Student's-t UCL	0.289		95% H-UCL				0.295
4764					**95% UCLs (Adjusted for Skewness)**			95% Chebyshev (MVUE) UCL				0.334
4765					95% Adjusted-CLT UCL	0.294		97.5% Chebyshev (MVUE) UCL				0.371
4766					95% Modified-t UCL	0.291		99% Chebyshev (MVUE) UCL				0.443
4767												
4768					**Gamma Distribution Test**			**Data Distribution**				
4769					k star (bias corrected)	14.26		**Data appear Normal at 5% Significance Level**				
4770					Theta Star	0.0175						

4771					nu star	228.1						
4772					Approximate Chi Square Value (.05)	194.1		**Nonparametric Statistics**				
4773					Adjusted Level of Significance	0.0195					95% CLT UCL	0.284
4774					Adjusted Chi Square Value	186.2					95% Jackknife UCL	0.289
4775											95% Standard Bootstrap UCL	0.283
4776					Anderson-Darling Test Statistic	0.383					95% Bootstrap-t UCL	0.308
4777					Anderson-Darling 5% Critical Value	0.716					95% Hall's Bootstrap UCL	0.326
4778					Kolmogorov-Smirnov Test Statistic	0.191					95% Percentile Bootstrap UCL	0.283
4779					Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	0.295
4780	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.341
4781											97.5% Chebyshev(Mean, Sd) UCL	0.38
4782	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.458
4783					95% Approximate Gamma UCL	0.293						
4784					95% Adjusted Gamma UCL	0.306						
4785												
4786	**Potential UCL to Use**										Use 95% Student's-t UCL	0.289
4787												
4788												
4789	**Chromium, dissolved (mw-50-200)**											
4790												
4791	**General Statistics**											
4792					Number of Valid Observations	10					Number of Distinct Observations	9
4793												
4794	**Raw Statistics**							**Log-transformed Statistics**				
4795					Minimum	5.91					Minimum of Log Data	1.777
4796					Maximum	14.6					Maximum of Log Data	2.681
4797					Mean	10.29					Mean of log Data	2.302
4798					Median	10.39					SD of log Data	0.264
4799					SD	2.515						
4800					Coefficient of Variation	0.244						
4801					Skewness	-0.164						
4802												
4803												
4804	**Relevant UCL Statistics**											
4805	**Normal Distribution Test**							**Lognormal Distribution Test**				
4806					Shapiro Wilk Test Statistic	0.973					Shapiro Wilk Test Statistic	0.944
4807					Shapiro Wilk Critical Value	0.842					Shapiro Wilk Critical Value	0.842
4808	**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
4809												
4810	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
4811					95% Student's-t UCL	11.75					95% H-UCL	12.27
4812	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	14.08
4813					95% Adjusted-CLT UCL	11.56					97.5% Chebyshev (MVUE) UCL	15.71
4814					95% Modified-t UCL	11.75					99% Chebyshev (MVUE) UCL	18.91
4815												
4816	**Gamma Distribution Test**							**Data Distribution**				
4817					k star (bias corrected)	12.03		**Data appear Normal at 5% Significance Level**				
4818					Theta Star	0.855						
4819					nu star	240.7						
4820					Approximate Chi Square Value (.05)	205.8		**Nonparametric Statistics**				
4821					Adjusted Level of Significance	0.0267					95% CLT UCL	11.6
4822					Adjusted Chi Square Value	200.1					95% Jackknife UCL	11.75
4823											95% Standard Bootstrap UCL	11.57

4824				Anderson-Darling Test Statistic	0.291					95% Bootstrap-t UCL	11.71
4825				Anderson-Darling 5% Critical Value	0.725					95% Hall's Bootstrap UCL	11.69
4826				Kolmogorov-Smirnov Test Statistic	0.162					95% Percentile Bootstrap UCL	11.57
4827				Kolmogorov-Smirnov 5% Critical Value	0.266					95% BCA Bootstrap UCL	11.5
4828				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	13.76
4829										97.5% Chebyshev(Mean, Sd) UCL	15.26
4830				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	18.21
4831				95% Approximate Gamma UCL	12.04						
4832				95% Adjusted Gamma UCL	12.38						
4833											
4834				**Potential UCL to Use**						Use 95% Student's-t UCL	11.75
4835											
4836											
4837	**Chromium, dissolved (mw-51)**										
4838											
4839				**General Statistics**							
4840				Number of Valid Observations	10					Number of Distinct Observations	9
4841											
4842				**Raw Statistics**						**Log-transformed Statistics**	
4843				Minimum	4.34					Minimum of Log Data	1.468
4844				Maximum	5.36					Maximum of Log Data	1.679
4845				Mean	4.731					Mean of log Data	1.552
4846				Median	4.595					SD of log Data	0.0691
4847				SD	0.335						
4848				Coefficient of Variation	0.0708						
4849				Skewness	0.951						
4850											
4851											
4852				**Relevant UCL Statistics**							
4853				**Normal Distribution Test**						**Lognormal Distribution Test**	
4854				Shapiro Wilk Test Statistic	0.853					Shapiro Wilk Test Statistic	0.863
4855				Shapiro Wilk Critical Value	0.842					Shapiro Wilk Critical Value	0.842
4856				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
4857											
4858				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
4859				95% Student's-t UCL	4.925					95% H-UCL	N/A
4860				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	5.182
4861				95% Adjusted-CLT UCL	4.939					97.5% Chebyshev (MVUE) UCL	5.377
4862				95% Modified-t UCL	4.93					99% Chebyshev (MVUE) UCL	5.76
4863											
4864				**Gamma Distribution Test**						**Data Distribution**	
4865				k star (bias corrected)	160.4					**Data appear Normal at 5% Significance Level**	
4866				Theta Star	0.0295						
4867				nu star	3207						
4868				Approximate Chi Square Value (.05)	3077					**Nonparametric Statistics**	
4869				Adjusted Level of Significance	0.0267					95% CLT UCL	4.905
4870				Adjusted Chi Square Value	3054					95% Jackknife UCL	4.925
4871										95% Standard Bootstrap UCL	4.897
4872				Anderson-Darling Test Statistic	0.807					95% Bootstrap-t UCL	4.988
4873				Anderson-Darling 5% Critical Value	0.724					95% Hall's Bootstrap UCL	4.901
4874				Kolmogorov-Smirnov Test Statistic	0.319					95% Percentile Bootstrap UCL	4.906
4875				Kolmogorov-Smirnov 5% Critical Value	0.266					95% BCA Bootstrap UCL	4.913
4876				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	5.193

4877											97.5% Chebyshev(Mean, Sd) UCL	5.392
4878				**Assuming Gamma Distribution**							99% Chebyshev(Mean, Sd) UCL	5.785
4879					95% Approximate Gamma UCL	4.932						
4880					95% Adjusted Gamma UCL	4.968						
4881												
4882				**Potential UCL to Use**							Use 95% Student's-t UCL	4.925
4883												
4884												
4885	**Chromium, dissolved (mw-52d)**											
4886												
4887					**General Statistics**							
4888					Number of Valid Data	8					Number of Detected Data	0
4889					Number of Distinct Detected Data	0					Number of Non-Detect Data	8
4890											Percent Non-Detects	100.00%
4891												
4892					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
4893					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
4894					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
4895												
4896					**The data set for variable Chromium, dissolved (mw-52d) was not processed!**							
4897												
4898												
4899												
4900	**Chromium, dissolved (mw-52m)**											
4901												
4902					**General Statistics**							
4903					Number of Valid Data	8					Number of Detected Data	0
4904					Number of Distinct Detected Data	0					Number of Non-Detect Data	8
4905											Percent Non-Detects	100.00%
4906												
4907					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
4908					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
4909					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
4910												
4911					**The data set for variable Chromium, dissolved (mw-52m) was not processed!**							
4912												
4913												
4914												
4915	**Chromium, dissolved (mw-52s)**											
4916												
4917					**General Statistics**							
4918					Number of Valid Data	8					Number of Detected Data	0
4919					Number of Distinct Detected Data	0					Number of Non-Detect Data	8
4920											Percent Non-Detects	100.00%
4921												
4922					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
4923					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
4924					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
4925												
4926					**The data set for variable Chromium, dissolved (mw-52s) was not processed!**							
4927												
4928												
4929												

	A	B	C	D	E	F	G	H	I	J	K	L
4930	**Chromium, dissolved (mw-53d)**											
4931												
4932	**General Statistics**											
4933	Number of Valid Data					8	Number of Detected Data					2
4934	Number of Distinct Detected Data					2	Number of Non-Detect Data					6
4935							Percent Non-Detects					75.00%
4936												
4937	**Raw Statistics**						**Log-transformed Statistics**					
4938	Minimum Detected					0.00141	Minimum Detected					-6.564
4939	Maximum Detected					0.0023	Maximum Detected					-6.075
4940	Mean of Detected					0.00186	Mean of Detected					-6.32
4941	SD of Detected					0.0006293	SD of Detected					0.346
4942	Minimum Non-Detect					0.001	Minimum Non-Detect					-6.908
4943	Maximum Non-Detect					0.001	Maximum Non-Detect					-6.908
4944												
4945												
4946	**Warning: Data set has only 2 Distinct Detected Values.**											
4947	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
4948	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
4949												
4950	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
4951												
4952	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
4953	**Those methods will return a 'N/A' value on your output display!**											
4954												
4955	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
4956	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
4957												
4958												
4959	**UCL Statistics**											
4960	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
4961	Shapiro Wilk Test Statistic					1	Shapiro Wilk Test Statistic					1
4962	5% Shapiro Wilk Critical Value					N/A	5% Shapiro Wilk Critical Value					N/A
4963	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
4964												
4965	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
4966	DL/2 Substitution Method						DL/2 Substitution Method					
4967	Mean					0.0008388	Mean					-7.281
4968	SD					0.0006708	SD					0.607
4969	95% DL/2 (t) UCL					0.00129	95% H-Stat (DL/2) UCL					0.00112
4970												
4971	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
4972	**MLE method failed to converge properly**						Mean in Log Scale					N/A
4973							SD in Log Scale					N/A
4974							Mean in Original Scale					N/A
4975							SD in Original Scale					N/A
4976							95% Percentile Bootstrap UCL					N/A
4977							95% BCA Bootstrap UCL					N/A
4978												
4979	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
4980	k star (bias corrected)					N/A	**Data do not follow a Discernable Distribution (0.05)**					
4981	Theta Star					N/A						
4982	nu star					N/A						

4983												
4984					A-D Test Statistic	0.359	**Nonparametric Statistics**					
4985					5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method		
4986					K-S Test Statistic	N/A				Mean		0.00152
4987					5% K-S Critical Value	N/A				SD		0.0002943
4988				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.0001472
4989										95% KM (t) UCL		0.0018
4990				**Assuming Gamma Distribution**						95% KM (z) UCL		0.00176
4991					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		N/A
4992					Minimum	N/A				95% KM (bootstrap t) UCL		N/A
4993					Maximum	N/A				95% KM (BCA) UCL		N/A
4994					Mean	N/A				95% KM (Percentile Bootstrap) UCL		N/A
4995					Median	N/A				95% KM (Chebyshev) UCL		0.00216
4996					SD	N/A				97.5% KM (Chebyshev) UCL		0.00244
4997					k star	N/A				99% KM (Chebyshev) UCL		0.00299
4998					Theta star	N/A						
4999					Nu star	N/A	**Potential UCLs to Use**					
5000					AppChi2	N/A				95% KM (t) UCL		0.0018
5001					95% Gamma Approximate UCL	N/A				95% KM (% Bootstrap) UCL		N/A
5002					95% Adjusted Gamma UCL	N/A						
5003	**Note: DL/2 is not a recommended method.**											
5004												
5005												
5006	**Chromium, dissolved (mw-53m)**											
5007												
5008					**General Statistics**							
5009					Number of Valid Data	8				Number of Detected Data		0
5010					Number of Distinct Detected Data	0				Number of Non-Detect Data		8
5011										Percent Non-Detects		100.00%
5012												
5013	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
5014	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
5015	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
5016												
5017	**The data set for variable Chromium, dissolved (mw-53m) was not processed!**											
5018												
5019												
5020												
5021	**Chromium, dissolved (mw-54-140)**											
5022												
5023					**General Statistics**							
5024					Number of Valid Data	3				Number of Detected Data		0
5025					Number of Distinct Detected Data	0				Number of Non-Detect Data		3
5026										Percent Non-Detects		100.00%
5027												
5028	**Warning: This data set only has 3 observations!**											
5029	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5030	**The data set for variable Chromium, dissolved (mw-54-140) was not processed!**											
5031												
5032	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5033	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5034												
5035												

	A	B	C	D	E	F	G	H	I	J	K	L
5036												
5037	**Chromium, dissolved (mw-54-195)**											
5038												
5039	**General Statistics**											
5040						Number of Valid Data	3			Number of Detected Data		0
5041						Number of Distinct Detected Data	0			Number of Non-Detect Data		3
5042										Percent Non-Detects		100.00%
5043												
5044	**Warning: This data set only has 3 observations!**											
5045	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5046	**The data set for variable Chromium, dissolved (mw-54-195) was not processed!**											
5047												
5048	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5049	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5050												
5051												
5052												
5053	**Chromium, dissolved (mw-54-85)**											
5054												
5055	**General Statistics**											
5056						Number of Valid Data	3			Number of Detected Data		0
5057						Number of Distinct Detected Data	0			Number of Non-Detect Data		3
5058										Percent Non-Detects		100.00%
5059												
5060	**Warning: This data set only has 3 observations!**											
5061	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5062	**The data set for variable Chromium, dissolved (mw-54-85) was not processed!**											
5063												
5064	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5065	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5066												
5067												
5068												
5069	**Chromium, dissolved (mw-55-120)**											
5070												
5071	**General Statistics**											
5072						Number of Valid Data	3			Number of Detected Data		0
5073						Number of Distinct Detected Data	0			Number of Non-Detect Data		3
5074										Percent Non-Detects		100.00%
5075												
5076	**Warning: This data set only has 3 observations!**											
5077	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5078	**The data set for variable Chromium, dissolved (mw-55-120) was not processed!**											
5079												
5080	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5081	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5082												
5083												
5084												
5085	**Chromium, dissolved (mw-55-45)**											
5086												
5087	**General Statistics**											
5088						Number of Valid Data	3			Number of Detected Data		0

5089			Number of Distinct Detected Data		0			Number of Non-Detect Data			3	
5090								Percent Non-Detects			100.00%	
5091												
5092					Warning: This data set only has 3 observations!							
5093					Data set is too small to compute reliable and meaningful statistics and estimates!							
5094					The data set for variable Chromium, dissolved (mw-55-45) was not processed!							
5095												
5096					It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
5097					If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
5098												
5099												
5100												
5101	Chromium, dissolved (mw-56d)											
5102												
5103					General Statistics							
5104			Number of Valid Data		3			Number of Detected Data			0	
5105			Number of Distinct Detected Data		0			Number of Non-Detect Data			3	
5106								Percent Non-Detects			100.00%	
5107												
5108					Warning: This data set only has 3 observations!							
5109					Data set is too small to compute reliable and meaningful statistics and estimates!							
5110					The data set for variable Chromium, dissolved (mw-56d) was not processed!							
5111												
5112					It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
5113					If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
5114												
5115												
5116												
5117	Chromium, dissolved (mw-56m)											
5118												
5119					General Statistics							
5120			Number of Valid Data		3			Number of Detected Data			0	
5121			Number of Distinct Detected Data		0			Number of Non-Detect Data			3	
5122								Percent Non-Detects			100.00%	
5123												
5124					Warning: This data set only has 3 observations!							
5125					Data set is too small to compute reliable and meaningful statistics and estimates!							
5126					The data set for variable Chromium, dissolved (mw-56m) was not processed!							
5127												
5128					It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
5129					If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
5130												
5131												
5132												
5133	Chromium, dissolved (mw-56s)											
5134												
5135					General Statistics							
5136			Number of Valid Data		3			Number of Detected Data			0	
5137			Number of Distinct Detected Data		0			Number of Non-Detect Data			3	
5138								Percent Non-Detects			100.00%	
5139												
5140					Warning: This data set only has 3 observations!							
5141					Data set is too small to compute reliable and meaningful statistics and estimates!							

	A	B	C	D	E	F	G	H	I	J	K	L
5142	**The data set for variable Chromium, dissolved (mw-56s) was not processed!**											
5143												
5144	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5145	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5146												
5147												
5148												
5149	**Chromium, dissolved (mw-6)**											
5150												
5151	**General Statistics**											
5152						Number of Valid Data	9			Number of Detected Data	7	
5153						Number of Distinct Detected Data	7			Number of Non-Detect Data	2	
5154										Percent Non-Detects	22.22%	
5155												
5156	**Raw Statistics**							**Log-transformed Statistics**				
5157						Minimum Detected	0.00798	Log Statistics Not Avaliable				
5158						Maximum Detected	0.031					
5159						Mean of Detected	0.0134					
5160						Mean of Detected	0.0134					
5161						Mean of Detected	0.0134					
5162						Maximum Non-Detect	0.02					
5163	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	8	
5164	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
5165	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	88.89%	
5166												
5167	**Warning: There are only 7 Detected Values in this data**											
5168	**Note: It should be noted that even though bootstrap may be performed on this data set**											
5169	**the resulting calculations may not be reliable enough tp draw conclusions**											
5170												
5171	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
5172												
5173												
5174	**UCL Statistics**											
5175	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
5176						Shapiro Wilk Test Statistic	0.696	Not Available				
5177						5% Shapiro Wilk Critical Value	0.803					
5178	**Data not Normal at 5% Significance Level**											
5179												
5180	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
5181						DL/2 Substitution Method				DL/2 Substitution Method	N/A	
5182						Mean	0.0115					
5183						SD	0.00831					
5184						95% DL/2 (t) UCL	0.0167					
5185												
5186						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method	N/A	
5187												
5188	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
5189	Gamma Statistics Not Available							Data Follow Appr. Gamma Distribution at 5% Significance Level				
5190												
5191												
5192	**Potential UCLs to Use**							**Nonparametric Statistics**				
5193						95% KM (Percentile Bootstrap) UCL	0.0168			Kaplan-Meier (KM) Method		
5194										Mean	0.0124	

5195											SD	0.00692
5196											SE of Mean	0.00251
5197											95% KM (t) UCL	0.0171
5198											95% KM (z) UCL	0.0165
5199											95% KM (jackknife) UCL	0.017
5200											95% KM (bootstrap t) UCL	0.0257
5201											95% KM (BCA) UCL	0.0173
5202											95% KM (Percentile Bootstrap) UCL	0.0168
5203											95% KM (Chebyshev) UCL	0.0233
5204											97.5% KM (Chebyshev) UCL	0.0281
5205											99% KM (Chebyshev) UCL	0.0374
5206	**Note: DL/2 is not a recommended method.**											
5207												
5208												
5209	**Chromium, dissolved (mw-7)**											
5210												
5211	**General Statistics**											
5212	Number of Valid Observations				9		Number of Distinct Observations				9	
5213												
5214	**Raw Statistics**						**Log-transformed Statistics**					
5215	Minimum				0.0134		Minimum of Log Data				-4.313	
5216	Maximum				0.19		Maximum of Log Data				-1.661	
5217	Mean				0.0397		Mean of log Data				-3.662	
5218	Median				0.019		SD of log Data				0.806	
5219	SD				0.0568							
5220	Coefficient of Variation				1.429							
5221	Skewness				2.921							
5222												
5223												
5224	**Warning: There are only 9 Values in this data**											
5225	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
5226	**the resulting calculations may not be reliable enough to draw conclusions**											
5227												
5228	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
5229												
5230	**Relevant UCL Statistics**											
5231	**Normal Distribution Test**						**Lognormal Distribution Test**					
5232	Shapiro Wilk Test Statistic				0.493		Shapiro Wilk Test Statistic				0.723	
5233	Shapiro Wilk Critical Value				0.829		Shapiro Wilk Critical Value				0.829	
5234	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
5235												
5236	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
5237	95% Student's-t UCL				0.0749		95% H-UCL				0.0795	
5238	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL				0.075	
5239	95% Adjusted-CLT UCL				0.0905		97.5% Chebyshev (MVUE) UCL				0.0928	
5240	95% Modified-t UCL				0.078		99% Chebyshev (MVUE) UCL				0.128	
5241												
5242	**Gamma Distribution Test**						**Data Distribution**					
5243	k star (bias corrected)				0.933		**Data do not follow a Discernable Distribution (0.05)**					
5244	Theta Star				0.0426							
5245	nu star				16.79							
5246	Approximate Chi Square Value (.05)				8.52		**Nonparametric Statistics**					
5247	Adjusted Level of Significance				0.0231		95% CLT UCL				0.0708	

5248					Adjusted Chi Square Value	7.312					95% Jackknife UCL	0.0749
5249											95% Standard Bootstrap UCL	0.0684
5250					Anderson-Darling Test Statistic	1.545					95% Bootstrap-t UCL	0.364
5251					Anderson-Darling 5% Critical Value	0.738					95% Hall's Bootstrap UCL	0.217
5252					Kolmogorov-Smirnov Test Statistic	0.335					95% Percentile Bootstrap UCL	0.0769
5253					Kolmogorov-Smirnov 5% Critical Value	0.285					95% BCA Bootstrap UCL	0.0963
5254					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.122
5255											97.5% Chebyshev(Mean, Sd) UCL	0.158
5256					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.228
5257					95% Approximate Gamma UCL	0.0783						
5258					95% Adjusted Gamma UCL	0.0912						
5259												
5260					**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	0.122
5261												
5262												
5263	**Chromium, dissolved (mw-8)**											
5264												
5265					**General Statistics**							
5266					Number of Valid Observations	9					Number of Distinct Observations	9
5267												
5268					**Raw Statistics**						**Log-transformed Statistics**	
5269					Minimum	0.033					Minimum of Log Data	-3.411
5270					Maximum	0.1					Maximum of Log Data	-2.303
5271					Mean	0.0589					Mean of log Data	-2.871
5272					Median	0.0563					SD of log Data	0.294
5273					SD	0.0182						
5274					Coefficient of Variation	0.309						
5275					Skewness	1.366						
5276												
5277												
5278					**Warning: There are only 9 Values in this data**							
5279					**Note: It should be noted that even though bootstrap methods may be performed on this data set,**							
5280					**the resulting calculations may not be reliable enough to draw conclusions**							
5281												
5282					**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**							
5283												
5284					**Relevant UCL Statistics**							
5285					**Normal Distribution Test**						**Lognormal Distribution Test**	
5286					Shapiro Wilk Test Statistic	0.874					Shapiro Wilk Test Statistic	0.935
5287					Shapiro Wilk Critical Value	0.829					Shapiro Wilk Critical Value	0.829
5288					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
5289												
5290					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
5291					95% Student's-t UCL	0.0702					95% H-UCL	0.0728
5292					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0841
5293					95% Adjusted-CLT UCL	0.0718					97.5% Chebyshev (MVUE) UCL	0.095
5294					95% Modified-t UCL	0.0706					99% Chebyshev (MVUE) UCL	0.117
5295												
5296					**Gamma Distribution Test**						**Data Distribution**	
5297					k star (bias corrected)	8.704					**Data appear Normal at 5% Significance Level**	
5298					Theta Star	0.00676						
5299					nu star	156.7						
5300					Approximate Chi Square Value (.05)	128.7					**Nonparametric Statistics**	

5301					Adjusted Level of Significance	0.0231					95% CLT UCL	0.0689
5302					Adjusted Chi Square Value	123.4					95% Jackknife UCL	0.0702
5303											95% Standard Bootstrap UCL	0.0686
5304					Anderson-Darling Test Statistic	0.433					95% Bootstrap-t UCL	0.076
5305					Anderson-Darling 5% Critical Value	0.722					95% Hall's Bootstrap UCL	0.13
5306					Kolmogorov-Smirnov Test Statistic	0.176					95% Percentile Bootstrap UCL	0.0692
5307					Kolmogorov-Smirnov 5% Critical Value	0.279					95% BCA Bootstrap UCL	0.0705
5308					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0853
5309											97.5% Chebyshev(Mean, Sd) UCL	0.0968
5310					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.119
5311					95% Approximate Gamma UCL	0.0717						
5312					95% Adjusted Gamma UCL	0.0748						
5313												
5314					**Potential UCL to Use**						Use 95% Student's-t UCL	0.0702
5315												
5316												
5317	**Chromium, dissolved (mw-9)**											
5318												
5319					**General Statistics**							
5320					Number of Valid Observations	34					Number of Distinct Observations	24
5321												
5322					**Raw Statistics**						**Log-transformed Statistics**	
5323					Minimum	0.287					Minimum of Log Data	-1.248
5324					Maximum	0.46					Maximum of Log Data	-0.777
5325					Mean	0.338					Mean of log Data	-1.091
5326					Median	0.334					SD of log Data	0.107
5327					SD	0.0382						
5328					Coefficient of Variation	0.113						
5329					Skewness	1.39						
5330												
5331					**Relevant UCL Statistics**							
5332					**Normal Distribution Test**						**Lognormal Distribution Test**	
5333					Shapiro Wilk Test Statistic	0.894					Shapiro Wilk Test Statistic	0.93
5334					Shapiro Wilk Critical Value	0.933					Shapiro Wilk Critical Value	0.933
5335					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
5336												
5337					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
5338					95% Student's-t UCL	0.349					95% H-UCL	0.349
5339					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.365
5340					95% Adjusted-CLT UCL	0.35					97.5% Chebyshev (MVUE) UCL	0.376
5341					95% Modified-t UCL	0.349					99% Chebyshev (MVUE) UCL	0.399
5342												
5343					**Gamma Distribution Test**						**Data Distribution**	
5344					k star (bias corrected)	79.32					**Data appear Gamma Distributed at 5% Significance Level**	
5345					Theta Star	0.00426						
5346					nu star	5393						
5347					Approximate Chi Square Value (.05)	5224					**Nonparametric Statistics**	
5348					Adjusted Level of Significance	0.0422					95% CLT UCL	0.348
5349					Adjusted Chi Square Value	5216					95% Jackknife UCL	0.349
5350											95% Standard Bootstrap UCL	0.348
5351					Anderson-Darling Test Statistic	0.73					95% Bootstrap-t UCL	0.352
5352					Anderson-Darling 5% Critical Value	0.745					95% Hall's Bootstrap UCL	0.352
5353					Kolmogorov-Smirnov Test Statistic	0.126					95% Percentile Bootstrap UCL	0.349

5354					Kolmogorov-Smirnov 5% Critical Value	0.15				95% BCA Bootstrap UCL		0.35
5355					**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL		0.366
5356										97.5% Chebyshev(Mean, Sd) UCL		0.379
5357					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL		0.403
5358					95% Approximate Gamma UCL	0.349						
5359					95% Adjusted Gamma UCL	0.349						
5360												
5361					**Potential UCL to Use**					Use 95% Approximate Gamma UCL		0.349
5362												
5363												
5364	**Chromium, dissolved (mwp-12)**											
5365												
5366					**General Statistics**							
5367					Number of Valid Data	1				Number of Detected Data		0
5368					Number of Distinct Detected Data	0				Number of Non-Detect Data		1
5369										Percent Non-Detects		100.00%
5370												
5371					**Warning: This data set only has 1 observations!**							
5372					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
5373					**The data set for variable Chromium, dissolved (mwp-12) was not processed!**							
5374												
5375					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
5376					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
5377												
5378												
5379												
5380	**Chromium, dissolved (ow-1d)**											
5381												
5382					**General Statistics**							
5383					Number of Valid Data	19				Number of Detected Data		11
5384					Number of Distinct Detected Data	9				Number of Non-Detect Data		8
5385										Percent Non-Detects		42.11%
5386												
5387					**Raw Statistics**					**Log-transformed Statistics**		
5388					Minimum Detected	0.0011				Minimum Detected		-6.812
5389					Maximum Detected	0.0048				Maximum Detected		-5.339
5390					Mean of Detected	0.00169				Mean of Detected		-6.495
5391					SD of Detected	0.00107				SD of Detected		0.434
5392					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
5393					Maximum Non-Detect	0.0016				Maximum Non-Detect		-6.438
5394												
5395	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		15
5396	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		4
5397	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		78.95%
5398												
5399					**UCL Statistics**							
5400					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
5401					Shapiro Wilk Test Statistic	0.58				Shapiro Wilk Test Statistic		0.741
5402					5% Shapiro Wilk Critical Value	0.85				5% Shapiro Wilk Critical Value		0.85
5403					**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**		
5404												
5405					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
5406					DL/2 Substitution Method					DL/2 Substitution Method		

5407					Mean	0.00121					Mean	-6.922
5408					SD	0.0009868					SD	0.618
5409					95% DL/2 (t) UCL	0.0016					95% H-Stat (DL/2) UCL	0.0012
5410												
5411					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
5412					**MLE yields a negative mean**						Mean in Log Scale	-6.861
5413											SD in Log Scale	0.576
5414											Mean in Original Scale	0.00125
5415											SD in Original Scale	0.000962
5416											95% Percentile Bootstrap UCL	0.00165
5417											95% BCA Bootstrap UCL	0.00179
5418												
5419					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
5420					k star (bias corrected)	3.486					**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
5421					Theta Star	0.000484						
5422					nu star	76.69						
5423												
5424					A-D Test Statistic	1.301					**Nonparametric Statistics**	
5425					5% A-D Critical Value	0.732					Kaplan-Meier (KM) Method	
5426					K-S Test Statistic	0.732					Mean	0.00144
5427					5% K-S Critical Value	0.256					SD	0.0008297
5428					**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean	0.0001997
5429											95% KM (t) UCL	0.00179
5430					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00177
5431					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00178
5432					Minimum	0.0004822					95% KM (bootstrap t) UCL	0.00256
5433					Maximum	0.0048					95% KM (BCA) UCL	0.00184
5434					Mean	0.00156					95% KM (Percentile Bootstrap) UCL	0.00181
5435					Median	0.00137					95% KM (Chebyshev) UCL	0.00231
5436					SD	0.0008767					97.5% KM (Chebyshev) UCL	0.00269
5437					k star	4.228					99% KM (Chebyshev) UCL	0.00343
5438					Theta star	0.0003684						
5439					Nu star	160.7					**Potential UCLs to Use**	
5440					AppChi2	132.4					95% KM (t) UCL	0.00179
5441					95% Gamma Approximate UCL	0.00189						
5442					95% Adjusted Gamma UCL	0.00192						
5443	**Note: DL/2 is not a recommended method.**											
5444												
5445												
5446	**Chromium, dissolved (ow-1m)**											
5447												
5448							**General Statistics**					
5449					Number of Valid Data	18					Number of Detected Data	14
5450					Number of Distinct Detected Data	14					Number of Non-Detect Data	4
5451											Percent Non-Detects	22.22%
5452												
5453					**Raw Statistics**						**Log-transformed Statistics**	
5454					Minimum Detected	0.00131					Minimum Detected	-6.638
5455					Maximum Detected	0.0189					Maximum Detected	-3.969
5456					Mean of Detected	0.00711					Mean of Detected	-5.274
5457					SD of Detected	0.00559					SD of Detected	0.879
5458					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
5459					Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908

5460												
5461												
5462	**UCL Statistics**											
5463	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
5464					Shapiro Wilk Test Statistic	0.888					Shapiro Wilk Test Statistic	0.943
5465					5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874
5466	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
5467												
5468	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
5469					DL/2 Substitution Method						DL/2 Substitution Method	
5470					Mean	0.00564					Mean	-5.791
5471					SD	0.00565					SD	1.258
5472					95% DL/2 (t) UCL	0.00796					95% H-Stat (DL/2) UCL	0.0119
5473												
5474					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
5475					Mean	0.00485					Mean in Log Scale	-5.74
5476					SD	0.00655					SD in Log Scale	1.195
5477					95% MLE (t) UCL	0.00754					Mean in Original Scale	0.00568
5478					95% MLE (Tiku) UCL	0.00759					SD in Original Scale	0.00561
5479											95% Percentile Bootstrap UCL	0.00776
5480											95% BCA Bootstrap UCL	0.00819
5481												
5482	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
5483					k star (bias corrected)	1.364	**Data appear Normal at 5% Significance Level**					
5484					Theta Star	0.00521						
5485					nu star	38.19						
5486												
5487					A-D Test Statistic	0.365	**Nonparametric Statistics**					
5488					5% A-D Critical Value	0.749					Kaplan-Meier (KM) Method	
5489					K-S Test Statistic	0.749					Mean	0.00582
5490					5% K-S Critical Value	0.232					SD	0.00533
5491	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0013
5492											95% KM (t) UCL	0.00809
5493	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00796
5494					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00804
5495					Minimum	1E-09					95% KM (bootstrap t) UCL	0.00871
5496					Maximum	0.0189					95% KM (BCA) UCL	0.00819
5497					Mean	0.00573					95% KM (Percentile Bootstrap) UCL	0.00795
5498					Median	0.00345					95% KM (Chebyshev) UCL	0.0115
5499					SD	0.00558					97.5% KM (Chebyshev) UCL	0.014
5500					k star	0.325					99% KM (Chebyshev) UCL	0.0188
5501					Theta star	0.0176						
5502					Nu star	11.71	**Potential UCLs to Use**					
5503					AppChi2	5.035					95% KM (t) UCL	0.00809
5504					95% Gamma Approximate UCL	0.0133					95% KM (Percentile Bootstrap) UCL	0.00795
5505					95% Adjusted Gamma UCL	0.0145						
5506	**Note: DL/2 is not a recommended method.**											
5507												
5508												
5509	**Chromium, dissolved (ow-1s)**											
5510												
5511	**General Statistics**											
5512					Number of Valid Observations	15					Number of Distinct Observations	15

5513												
5514	**Raw Statistics**						**Log-transformed Statistics**					
5515					Minimum	0.0034					Minimum of Log Data	-5.684
5516					Maximum	0.0235					Maximum of Log Data	-3.751
5517					Mean	0.0176					Mean of log Data	-4.105
5518					Median	0.0181					SD of log Data	0.455
5519					SD	0.00461						
5520					Coefficient of Variation	0.262						
5521					Skewness	-2.105						
5522												
5523	**Relevant UCL Statistics**											
5524	**Normal Distribution Test**						**Lognormal Distribution Test**					
5525					Shapiro Wilk Test Statistic	0.787					Shapiro Wilk Test Statistic	0.553
5526					Shapiro Wilk Critical Value	0.881					Shapiro Wilk Critical Value	0.881
5527	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
5528												
5529	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
5530					95% Student's-t UCL	0.0197					95% H-UCL	0.0234
5531	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0277
5532					95% Adjusted-CLT UCL	0.0189					97.5% Chebyshev (MVUE) UCL	0.0318
5533					95% Modified-t UCL	0.0196					99% Chebyshev (MVUE) UCL	0.0399
5534												
5535	**Gamma Distribution Test**						**Data Distribution**					
5536					k star (bias corrected)	6.333	**Data do not follow a Discernable Distribution (0.05)**					
5537					Theta Star	0.00278						
5538					nu star	190						
5539					Approximate Chi Square Value (.05)	159.1	**Nonparametric Statistics**					
5540					Adjusted Level of Significance	0.0324					95% CLT UCL	0.0196
5541					Adjusted Chi Square Value	155.6					95% Jackknife UCL	0.0197
5542											95% Standard Bootstrap UCL	0.0195
5543					Anderson-Darling Test Statistic	2.018					95% Bootstrap-t UCL	0.0192
5544					Anderson-Darling 5% Critical Value	0.738					95% Hall's Bootstrap UCL	0.0191
5545					Kolmogorov-Smirnov Test Statistic	0.323					95% Percentile Bootstrap UCL	0.0193
5546					Kolmogorov-Smirnov 5% Critical Value	0.222					95% BCA Bootstrap UCL	0.0191
5547	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.0228
5548											97.5% Chebyshev(Mean, Sd) UCL	0.025
5549	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.0294
5550					95% Approximate Gamma UCL	0.021						
5551					95% Adjusted Gamma UCL	0.0215						
5552												
5553	**Potential UCL to Use**										Use 95% Student's-t UCL	0.0197
5554											or 95% Modified-t UCL	0.0196
5555												
5556												
5557	**Chromium, dissolved (ow-2d)**											
5558												
5559	**General Statistics**											
5560					Number of Valid Data	16					Number of Detected Data	2
5561					Number of Distinct Detected Data	2					Number of Non-Detect Data	14
5562											Percent Non-Detects	87.50%
5563												
5564	**Raw Statistics**						**Log-transformed Statistics**					
5565					Minimum Detected	0.0015					Minimum Detected	-6.502

5566				Maximum Detected	0.0019					Maximum Detected	-6.266	
5567				Mean of Detected	0.0017					Mean of Detected	-6.384	
5568				SD of Detected	0.0002828					SD of Detected	0.167	
5569				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
5570				Maximum Non-Detect	0.0012					Maximum Non-Detect	-6.725	
5571												
5572	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	14	
5573	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	2	
5574	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	87.50%	
5575												
5576	**Warning: Data set has only 2 Distinct Detected Values.**											
5577	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
5578	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
5579												
5580	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
5581												
5582	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
5583	**Those methods will return a 'N/A' value on your output display!**											
5584												
5585	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
5586	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
5587												
5588												
5589	**UCL Statistics**											
5590	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
5591				Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1	
5592				5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A	
5593	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**		
5594												
5595	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
5596				DL/2 Substitution Method						DL/2 Substitution Method		
5597				Mean	0.0006563					Mean	-7.437	
5598				SD	0.0004147					SD	0.416	
5599				95% DL/2 (t) UCL	0.000838					95% H-Stat (DL/2) UCL	0.000715	
5600												
5601				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
5602	**MLE method failed to converge properly**									Mean in Log Scale	N/A	
5603										SD in Log Scale	N/A	
5604										Mean in Original Scale	N/A	
5605										SD in Original Scale	N/A	
5606										95% Percentile Bootstrap UCL	N/A	
5607										95% BCA Bootstrap UCL	N/A	
5608												
5609	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
5610				k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**		
5611				Theta Star	N/A							
5612				nu star	N/A							
5613												
5614				A-D Test Statistic	0.359					**Nonparametric Statistics**		
5615				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
5616				K-S Test Statistic	N/A					Mean	0.00153	
5617				5% K-S Critical Value	N/A					SD	9.683E-05	
5618	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	3.423E-05	

5619											95% KM (t) UCL	0.00159
5620	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00158
5621				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.00179
5622					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
5623					Maximum	N/A					95% KM (BCA) UCL	0.0019
5624					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0019
5625					Median	N/A					95% KM (Chebyshev) UCL	0.00167
5626					SD	N/A					97.5% KM (Chebyshev) UCL	0.00174
5627					k star	N/A					99% KM (Chebyshev) UCL	0.00187
5628					Theta star	N/A						
5629					Nu star	N/A					**Potential UCLs to Use**	
5630					AppChi2	N/A					95% KM (t) UCL	0.00159
5631				95% Gamma Approximate UCL		N/A					95% KM (% Bootstrap) UCL	0.0019
5632				95% Adjusted Gamma UCL		N/A						
5633	**Note: DL/2 is not a recommended method.**											
5634												
5635												
5636	**Chromium, dissolved (ow-2m)**											
5637												
5638	**General Statistics**											
5639				Number of Valid Data		16					Number of Detected Data	14
5640				Number of Distinct Detected Data		13					Number of Non-Detect Data	2
5641											Percent Non-Detects	12.50%
5642												
5643	**Raw Statistics**										**Log-transformed Statistics**	
5644				Minimum Detected		0.00111					Minimum Detected	-6.803
5645				Maximum Detected		0.0089					Maximum Detected	-4.722
5646				Mean of Detected		0.00402					Mean of Detected	-5.719
5647				SD of Detected		0.00243					SD of Detected	0.697
5648				Minimum Non-Detect		0.001					Minimum Non-Detect	-6.908
5649				Maximum Non-Detect		0.001					Maximum Non-Detect	-6.908
5650												
5651												
5652	**UCL Statistics**											
5653	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
5654				Shapiro Wilk Test Statistic		0.927					Shapiro Wilk Test Statistic	0.921
5655				5% Shapiro Wilk Critical Value		0.874					5% Shapiro Wilk Critical Value	0.874
5656	**Data appear Normal at 5% Significance Level**										**Data appear Lognormal at 5% Significance Level**	
5657												
5658	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
5659				DL/2 Substitution Method							DL/2 Substitution Method	
5660					Mean	0.00358					Mean	-5.954
5661					SD	0.00256					SD	0.913
5662				95% DL/2 (t) UCL		0.0047					95% H-Stat (DL/2) UCL	0.00558
5663												
5664				Maximum Likelihood Estimate(MLE) Method							Log ROS Method	
5665					Mean	0.00346					Mean in Log Scale	-5.922
5666					SD	0.00268					SD in Log Scale	0.855
5667				95% MLE (t) UCL		0.00463					Mean in Original Scale	0.0036
5668				95% MLE (Tiku) UCL		0.00463					SD in Original Scale	0.00254
5669											95% Percentile Bootstrap UCL	0.00465
5670											95% BCA Bootstrap UCL	0.00466
5671												

5672	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
5673					k star (bias corrected)	2.113	**Data appear Normal at 5% Significance Level**					
5674					Theta Star	0.0019						
5675					nu star	59.17						
5676												
5677					A-D Test Statistic	0.381	**Nonparametric Statistics**					
5678					5% A-D Critical Value	0.744					Kaplan-Meier (KM) Method	
5679					K-S Test Statistic	0.744					Mean	0.00366
5680					5% K-S Critical Value	0.231					SD	0.00239
5681	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.000621
5682											95% KM (t) UCL	0.00474
5683	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00468
5684					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00473
5685					Minimum	1E-09					95% KM (bootstrap t) UCL	0.00493
5686					Maximum	0.0089					95% KM (BCA) UCL	0.00475
5687					Mean	0.00355					95% KM (Percentile Bootstrap) UCL	0.00469
5688					Median	0.00285					95% KM (Chebyshev) UCL	0.00636
5689					SD	0.00261					97.5% KM (Chebyshev) UCL	0.00753
5690					k star	0.49					99% KM (Chebyshev) UCL	0.00983
5691					Theta star	0.00724						
5692					Nu star	15.68	**Potential UCLs to Use**					
5693					AppChi2	7.735					95% KM (t) UCL	0.00474
5694					95% Gamma Approximate UCL	0.00719					95% KM (Percentile Bootstrap) UCL	0.00469
5695					95% Adjusted Gamma UCL	0.00782						
5696	**Note: DL/2 is not a recommended method.**											
5697												
5698												
5699	**Chromium, dissolved (ow-2s)**											
5700												
5701	**General Statistics**											
5702					Number of Valid Observations	16					Number of Distinct Observations	15
5703												
5704	**Raw Statistics**						**Log-transformed Statistics**					
5705					Minimum	0.0034					Minimum of Log Data	-5.684
5706					Maximum	0.0445					Maximum of Log Data	-3.112
5707					Mean	0.0311					Mean of log Data	-3.595
5708					Median	0.0349					SD of log Data	0.635
5709					SD	0.0112						
5710					Coefficient of Variation	0.359						
5711					Skewness	-1.23						
5712												
5713	**Relevant UCL Statistics**											
5714	**Normal Distribution Test**						**Lognormal Distribution Test**					
5715					Shapiro Wilk Test Statistic	0.874					Shapiro Wilk Test Statistic	0.667
5716					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
5717	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
5718												
5719	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
5720					95% Student's-t UCL	0.0359					95% H-UCL	0.0482
5721	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0571
5722					95% Adjusted-CLT UCL	0.0347					97.5% Chebyshev (MVUE) UCL	0.0675
5723					95% Modified-t UCL	0.0358					99% Chebyshev (MVUE) UCL	0.088
5724												

5725	**Gamma Distribution Test**						**Data Distribution**					
5726					k star (bias corrected)	3.484	**Data do not follow a Discernable Distribution (0.05)**					
5727					Theta Star	0.00891						
5728					nu star	111.5						
5729					Approximate Chi Square Value (.05)	88.12	**Nonparametric Statistics**					
5730					Adjusted Level of Significance	0.0335				95% CLT UCL	0.0356	
5731					Adjusted Chi Square Value	85.76				95% Jackknife UCL	0.0359	
5732										95% Standard Bootstrap UCL	0.0354	
5733					Anderson-Darling Test Statistic	1.467				95% Bootstrap-t UCL	0.0352	
5734					Anderson-Darling 5% Critical Value	0.742				95% Hall's Bootstrap UCL	0.0348	
5735					Kolmogorov-Smirnov Test Statistic	0.271				95% Percentile Bootstrap UCL	0.0353	
5736					Kolmogorov-Smirnov 5% Critical Value	0.216				95% BCA Bootstrap UCL	0.0348	
5737	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.0432	
5738										97.5% Chebyshev(Mean, Sd) UCL	0.0485	
5739	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.0588	
5740					95% Approximate Gamma UCL	0.0393						
5741					95% Adjusted Gamma UCL	0.0404						
5742												
5743	**Potential UCL to Use**									Use 95% Chebyshev (Mean, Sd) UCL	0.0432	
5744												
5745												
5746	**Chromium, dissolved (ow-3d)**											
5747												
5748	**General Statistics**											
5749					Number of Valid Data	8				Number of Detected Data	4	
5750					Number of Distinct Detected Data	4				Number of Non-Detect Data	4	
5751										Percent Non-Detects	50.00%	
5752												
5753	**Raw Statistics**						**Log-transformed Statistics**					
5754					Minimum Detected	0.0022				Minimum Detected	-6.119	
5755					Maximum Detected	0.0042				Maximum Detected	-5.473	
5756					Mean of Detected	0.00325				Mean of Detected	-5.757	
5757					SD of Detected	0.0008544				SD of Detected	0.278	
5758					Minimum Non-Detect	0.001				Minimum Non-Detect	-6.908	
5759					Maximum Non-Detect	0.001				Maximum Non-Detect	-6.908	
5760												
5761												
5762	**Warning: There are only 4 Distinct Detected Values in this data**											
5763	**Note: It should be noted that even though bootstrap may be performed on this data set**											
5764	**the resulting calculations may not be reliable enough tp draw conclusions**											
5765												
5766	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
5767												
5768												
5769	**UCL Statistics**											
5770	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
5771					Shapiro Wilk Test Statistic	0.993				Shapiro Wilk Test Statistic	0.973	
5772					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value	0.748	
5773	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
5774												
5775	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
5776					DL/2 Substitution Method					DL/2 Substitution Method		
5777					Mean	0.00188				Mean	-6.679	

5778					SD	0.00157					SD	1.002
5779					95% DL/2 (t) UCL	0.00293					95% H-Stat (DL/2) UCL	0.00222
5780												
5781					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
5782					Mean	0.00325					Mean in Log Scale	-6.196
5783					SD	0.0007399					SD in Log Scale	0.533
5784					95% MLE (t) UCL	0.00375					Mean in Original Scale	0.0023
5785					95% MLE (Tiku) UCL	0.00395					SD in Original Scale	0.00118
5786											95% Percentile Bootstrap UCL	0.00295
5787											95% BCA Bootstrap UCL	0.00305
5788												
5789					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
5790					k star (bias corrected)	4.691					**Data appear Normal at 5% Significance Level**	
5791					Theta Star	0.0006928						
5792					nu star	37.53						
5793												
5794					A-D Test Statistic	0.221					**Nonparametric Statistics**	
5795					5% A-D Critical Value	0.657					Kaplan-Meier (KM) Method	
5796					K-S Test Statistic	0.657					Mean	0.00273
5797					5% K-S Critical Value	0.394					SD	0.0007412
5798					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0003026
5799											95% KM (t) UCL	0.0033
5800					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00322
5801					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00336
5802					Minimum	0.00217					95% KM (bootstrap t) UCL	0.0031
5803					Maximum	0.0042					95% KM (BCA) UCL	0.00383
5804					Mean	0.00325					95% KM (Percentile Bootstrap) UCL	0.00368
5805					Median	0.00332					95% KM (Chebyshev) UCL	0.00404
5806					SD	0.0007904					97.5% KM (Chebyshev) UCL	0.00461
5807					k star	11.3					99% KM (Chebyshev) UCL	0.00574
5808					Theta star	0.0002877						
5809					Nu star	180.8					**Potential UCLs to Use**	
5810					AppChi2	150.7					95% KM (t) UCL	0.0033
5811					95% Gamma Approximate UCL	0.0039					95% KM (Percentile Bootstrap) UCL	0.00368
5812					95% Adjusted Gamma UCL	N/A						
5813	**Note: DL/2 is not a recommended method.**											
5814												
5815												
5816	**Chromium, dissolved (ow-3m)**											
5817												
5818						**General Statistics**						
5819					Number of Valid Observations	10					Number of Distinct Observations	9
5820												
5821					**Raw Statistics**						**Log-transformed Statistics**	
5822					Minimum	0.0112					Minimum of Log Data	-4.492
5823					Maximum	0.02					Maximum of Log Data	-3.912
5824					Mean	0.0161					Mean of log Data	-4.145
5825					Median	0.0164					SD of log Data	0.201
5826					SD	0.00311						
5827					Coefficient of Variation	0.193						
5828					Skewness	-0.208						
5829												
5830												

	A	B	C	D	E	F	G	H	I	J	K	L
5831	**Relevant UCL Statistics**											
5832	**Normal Distribution Test**						**Lognormal Distribution Test**					
5833	Shapiro Wilk Test Statistic					0.942	Shapiro Wilk Test Statistic					0.936
5834	Shapiro Wilk Critical Value					0.842	Shapiro Wilk Critical Value					0.842
5835	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
5836												
5837	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
5838	95% Student's-t UCL					0.0179	95% H-UCL					0.0183
5839	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0206
5840	95% Adjusted-CLT UCL					0.0177	97.5% Chebyshev (MVUE) UCL					0.0225
5841	95% Modified-t UCL					0.0179	99% Chebyshev (MVUE) UCL					0.0264
5842												
5843	**Gamma Distribution Test**						**Data Distribution**					
5844	k star (bias corrected)					20.01	**Data appear Normal at 5% Significance Level**					
5845	Theta Star					0.0008055						
5846	nu star					400.2						
5847	Approximate Chi Square Value (.05)					354.9	**Nonparametric Statistics**					
5848	Adjusted Level of Significance					0.0267	95% CLT UCL					0.0177
5849	Adjusted Chi Square Value					347.4	95% Jackknife UCL					0.0179
5850							95% Standard Bootstrap UCL					0.0176
5851	Anderson-Darling Test Statistic					0.287	95% Bootstrap-t UCL					0.0179
5852	Anderson-Darling 5% Critical Value					0.725	95% Hall's Bootstrap UCL					0.0176
5853	Kolmogorov-Smirnov Test Statistic					0.165	95% Percentile Bootstrap UCL					0.0176
5854	Kolmogorov-Smirnov 5% Critical Value					0.266	95% BCA Bootstrap UCL					0.0176
5855	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.0204
5856							97.5% Chebyshev(Mean, Sd) UCL					0.0223
5857	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.0259
5858	95% Approximate Gamma UCL					0.0182						
5859	95% Adjusted Gamma UCL					0.0186						
5860												
5861	**Potential UCL to Use**						Use 95% Student's-t UCL					0.0179
5862												
5863												
5864	**Chromium, dissolved (ow-3s)**											
5865												
5866	**General Statistics**											
5867	Number of Valid Observations					9	Number of Distinct Observations					9
5868												
5869	**Raw Statistics**						**Log-transformed Statistics**					
5870	Minimum					0.0121	Minimum of Log Data					-4.415
5871	Maximum					0.0234	Maximum of Log Data					-3.755
5872	Mean					0.0187	Mean of log Data					-3.999
5873	Median					0.0182	SD of log Data					0.207
5874	SD					0.00361						
5875	Coefficient of Variation					0.193						
5876	Skewness					-0.437						
5877												
5878												
5879	**Warning: There are only 9 Values in this data**											
5880	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
5881	**the resulting calculations may not be reliable enough to draw conclusions**											
5882												
5883	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											

5884												
5885	**Relevant UCL Statistics**											
5886	**Normal Distribution Test**						**Lognormal Distribution Test**					
5887				Shapiro Wilk Test Statistic	0.939					Shapiro Wilk Test Statistic	0.913	
5888				Shapiro Wilk Critical Value	0.829					Shapiro Wilk Critical Value	0.829	
5889	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
5890												
5891	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
5892				95% Student's-t UCL	0.0209					95% H-UCL	0.0216	
5893	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.0243	
5894				95% Adjusted-CLT UCL	0.0205					97.5% Chebyshev (MVUE) UCL	0.0268	
5895				95% Modified-t UCL	0.0209					99% Chebyshev (MVUE) UCL	0.0315	
5896												
5897	**Gamma Distribution Test**						**Data Distribution**					
5898				k star (bias corrected)	18.59		**Data appear Normal at 5% Significance Level**					
5899				Theta Star	0.001							
5900				nu star	334.7							
5901				Approximate Chi Square Value (.05)	293.3		**Nonparametric Statistics**					
5902				Adjusted Level of Significance	0.0231					95% CLT UCL	0.0207	
5903				Adjusted Chi Square Value	285.1					95% Jackknife UCL	0.0209	
5904										95% Standard Bootstrap UCL	0.0205	
5905				Anderson-Darling Test Statistic	0.363					95% Bootstrap-t UCL	0.0208	
5906				Anderson-Darling 5% Critical Value	0.721					95% Hall's Bootstrap UCL	0.0205	
5907				Kolmogorov-Smirnov Test Statistic	0.175					95% Percentile Bootstrap UCL	0.0206	
5908				Kolmogorov-Smirnov 5% Critical Value	0.279					95% BCA Bootstrap UCL	0.0204	
5909	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.0239	
5910										97.5% Chebyshev(Mean, Sd) UCL	0.0262	
5911	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.0307	
5912				95% Approximate Gamma UCL	0.0213							
5913				95% Adjusted Gamma UCL	0.0219							
5914												
5915	**Potential UCL to Use**									Use 95% Student's-t UCL	0.0209	
5916												
5917												
5918	**Chromium, dissolved (ow-5d)**											
5919												
5920	**General Statistics**											
5921				Number of Valid Data	16					Number of Detected Data	5	
5922				Number of Distinct Detected Data	5					Number of Non-Detect Data	11	
5923										Percent Non-Detects	68.75%	
5924												
5925	**Raw Statistics**						**Log-transformed Statistics**					
5926				Minimum Detected	0.0011					Minimum Detected	-6.812	
5927				Maximum Detected	0.0039					Maximum Detected	-5.547	
5928				Mean of Detected	0.00182					Mean of Detected	-6.432	
5929				SD of Detected	0.00117					SD of Detected	0.504	
5930				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
5931				Maximum Non-Detect	0.0012					Maximum Non-Detect	-6.725	
5932												
5933	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	12	
5934	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	4	
5935	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	75.00%	
5936												

	A	B	C	D	E	F	G	H	I	J	K	L
5937	**Warning: There are only 5 Detected Values in this data**											
5938	**Note: It should be noted that even though bootstrap may be performed on this data set**											
5939	**the resulting calculations may not be reliable enough tp draw conclusions**											
5940												
5941	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
5942												
5943												
5944	**UCL Statistics**											
5945	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
5946	Shapiro Wilk Test Statistic					0.648	Shapiro Wilk Test Statistic					0.726
5947	5% Shapiro Wilk Critical Value					0.762	5% Shapiro Wilk Critical Value					0.762
5948	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
5949												
5950	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
5951	DL/2 Substitution Method						DL/2 Substitution Method					
5952	Mean					0.0009175	Mean					-7.224
5953	SD					0.0008705	SD					0.612
5954	95% DL/2 (t) UCL					0.0013	95% H-Stat (DL/2) UCL					0.00105
5955												
5956	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
5957	**MLE yields a negative mean**						Mean in Log Scale					-7.564
5958							SD in Log Scale					0.964
5959							Mean in Original Scale					0.0008145
5960							SD in Original Scale					0.0009359
5961							95% Percentile Bootstrap UCL					0.00122
5962							95% BCA Bootstrap UCL					0.00144
5963												
5964	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
5965	k star (bias corrected)					1.847	**Data do not follow a Discernable Distribution (0.05)**					
5966	Theta Star					0.000983						
5967	nu star					18.47						
5968												
5969	A-D Test Statistic					0.917	**Nonparametric Statistics**					
5970	5% A-D Critical Value					0.681	Kaplan-Meier (KM) Method					
5971	K-S Test Statistic					0.681	Mean					0.00132
5972	5% K-S Critical Value					0.358	SD					0.000673
5973	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0001881
5974							95% KM (t) UCL					0.00165
5975	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00163
5976	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00159
5977	Minimum					0.0006549	95% KM (bootstrap t) UCL					0.00258
5978	Maximum					0.00461	95% KM (BCA) UCL					0.00185
5979	Mean					0.00256	95% KM (Percentile Bootstrap) UCL					0.00171
5980	Median					0.00259	95% KM (Chebyshev) UCL					0.00214
5981	SD					0.00129	97.5% KM (Chebyshev) UCL					0.0025
5982	k star					2.988	99% KM (Chebyshev) UCL					0.0032
5983	Theta star					0.0008581						
5984	Nu star					95.62	**Potential UCLs to Use**					
5985	AppChi2					74.07	95% KM (t) UCL					0.00165
5986	95% Gamma Approximate UCL					0.00331	95% KM (% Bootstrap) UCL					0.00171
5987	95% Adjusted Gamma UCL					0.00341						
5988	**Note: DL/2 is not a recommended method.**											
5989												

5990												
5991	**Chromium, dissolved (ow-5m)**											
5992												
5993	**General Statistics**											
5994					Number of Valid Data	16			Number of Detected Data			15
5995					Number of Distinct Detected Data	15			Number of Non-Detect Data			1
5996									Percent Non-Detects			6.25%
5997												
5998	**Raw Statistics**						**Log-transformed Statistics**					
5999					Minimum Detected	0.00125			Minimum Detected			-6.685
6000					Maximum Detected	0.0113			Maximum Detected			-4.483
6001					Mean of Detected	0.0076			Mean of Detected			-5.092
6002					SD of Detected	0.00375			SD of Detected			0.788
6003					Minimum Non-Detect	0.001			Minimum Non-Detect			-6.908
6004					Maximum Non-Detect	0.001			Maximum Non-Detect			-6.908
6005												
6006												
6007	**UCL Statistics**											
6008	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
6009					Shapiro Wilk Test Statistic	0.806			Shapiro Wilk Test Statistic			0.735
6010					5% Shapiro Wilk Critical Value	0.881			5% Shapiro Wilk Critical Value			0.881
6011	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
6012												
6013	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
6014					DL/2 Substitution Method				DL/2 Substitution Method			
6015					Mean	0.00715			Mean			-5.249
6016					SD	0.00403			SD			0.987
6017					95% DL/2 (t) UCL	0.00892			95% H-Stat (DL/2) UCL			0.0135
6018												
6019					Maximum Likelihood Estimate(MLE) Method				Log ROS Method			
6020					Mean	0.00707			Mean in Log Scale			-5.196
6021					SD	0.00407			SD in Log Scale			0.867
6022					95% MLE (t) UCL	0.00886			Mean in Original Scale			0.00719
6023					95% MLE (Tiku) UCL	0.00886			SD in Original Scale			0.00396
6024									95% Percentile Bootstrap UCL			0.00873
6025									95% BCA Bootstrap UCL			0.00865
6026												
6027	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
6028					k star (bias corrected)	2.057	**Data do not follow a Discernable Distribution (0.05)**					
6029					Theta Star	0.00369						
6030					nu star	61.7						
6031												
6032					A-D Test Statistic	1.701	**Nonparametric Statistics**					
6033					5% A-D Critical Value	0.746			Kaplan-Meier (KM) Method			
6034					K-S Test Statistic	0.746			Mean			0.0072
6035					5% K-S Critical Value	0.224			SD			0.00383
6036	**Data not Gamma Distributed at 5% Significance Level**								SE of Mean			0.0009907
6037									95% KM (t) UCL			0.00894
6038	**Assuming Gamma Distribution**								95% KM (z) UCL			0.00883
6039					Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL			0.00893
6040					Minimum	0.0002125			95% KM (bootstrap t) UCL			0.00874
6041					Maximum	0.0113			95% KM (BCA) UCL			0.00877
6042					Mean	0.00714			95% KM (Percentile Bootstrap) UCL			0.00878

6043					Median	0.0087				95% KM (Chebyshev) UCL		0.0115
6044					SD	0.00406				97.5% KM (Chebyshev) UCL		0.0134
6045					k star	1.29				99% KM (Chebyshev) UCL		0.0171
6046					Theta star	0.00553						
6047					Nu star	41.29				**Potential UCLs to Use**		
6048					AppChi2	27.56				95% KM (Chebyshev) UCL		0.0115
6049				95% Gamma Approximate UCL		0.0107						
6050				95% Adjusted Gamma UCL		0.0112						
6051	**Warning: Recommended UCL exceeds the maximum observation**											
6052	**Note: DL/2 is not a recommended method.**											
6053												
6054												
6055	**Chromium, dissolved (ow-5s)**											
6056												
6057	**General Statistics**											
6058				Number of Valid Observations		16				Number of Distinct Observations		14
6059												
6060	**Raw Statistics**						**Log-transformed Statistics**					
6061				Minimum		0.0218				Minimum of Log Data		-3.826
6062				Maximum		0.0304				Maximum of Log Data		-3.493
6063				Mean		0.0259				Mean of log Data		-3.656
6064				Median		0.0256				SD of log Data		0.0966
6065				SD		0.0025						
6066				Coefficient of Variation		0.0964						
6067				Skewness		0.156						
6068												
6069	**Relevant UCL Statistics**											
6070	**Normal Distribution Test**						**Lognormal Distribution Test**					
6071				Shapiro Wilk Test Statistic		0.95				Shapiro Wilk Test Statistic		0.951
6072				Shapiro Wilk Critical Value		0.887				Shapiro Wilk Critical Value		0.887
6073	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
6074												
6075	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
6076				95% Student's-t UCL		0.027				95% H-UCL		N/A
6077	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL		0.0287
6078				95% Adjusted-CLT UCL		0.027				97.5% Chebyshev (MVUE) UCL		0.0299
6079				95% Modified-t UCL		0.027				99% Chebyshev (MVUE) UCL		0.0322
6080												
6081	**Gamma Distribution Test**						**Data Distribution**					
6082				k star (bias corrected)		93.31	**Data appear Normal at 5% Significance Level**					
6083				Theta Star		0.0002781						
6084				nu star		2986						
6085				Approximate Chi Square Value (.05)		2860	**Nonparametric Statistics**					
6086				Adjusted Level of Significance		0.0335				95% CLT UCL		0.027
6087				Adjusted Chi Square Value		2846				95% Jackknife UCL		0.027
6088										95% Standard Bootstrap UCL		0.0269
6089				Anderson-Darling Test Statistic		0.391				95% Bootstrap-t UCL		0.0271
6090				Anderson-Darling 5% Critical Value		0.736				95% Hall's Bootstrap UCL		0.0271
6091				Kolmogorov-Smirnov Test Statistic		0.153				95% Percentile Bootstrap UCL		0.0269
6092				Kolmogorov-Smirnov 5% Critical Value		0.214				95% BCA Bootstrap UCL		0.027
6093	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL		0.0287
6094										97.5% Chebyshev(Mean, Sd) UCL		0.0298
6095	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL		0.0322

6096				95% Approximate Gamma UCL	0.0271							
6097				95% Adjusted Gamma UCL	0.0272							
6098												
6099	**Potential UCL to Use**									Use 95% Student's-t UCL	0.027	
6100												
6101												
6102	**Chromium, dissolved (pe-1)**											
6103												
6104	**General Statistics**											
6105				Number of Valid Data	25				Number of Detected Data	22		
6106				Number of Distinct Detected Data	21				Number of Non-Detect Data	3		
6107									Percent Non-Detects	12.00%		
6108												
6109	**Raw Statistics**						**Log-transformed Statistics**					
6110				Minimum Detected	0.0397				Minimum Detected	-3.226		
6111				Maximum Detected	0.293				Maximum Detected	-1.228		
6112				Mean of Detected	0.0985				Mean of Detected	-2.421		
6113				SD of Detected	0.0525				SD of Detected	0.451		
6114				Minimum Non-Detect	0.001				Minimum Non-Detect	-6.908		
6115				Maximum Non-Detect	0.001				Maximum Non-Detect	-6.908		
6116												
6117												
6118	**UCL Statistics**											
6119	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
6120				Shapiro Wilk Test Statistic	0.759				Shapiro Wilk Test Statistic	0.944		
6121				5% Shapiro Wilk Critical Value	0.911				5% Shapiro Wilk Critical Value	0.911		
6122	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
6123												
6124	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
6125				DL/2 Substitution Method					DL/2 Substitution Method			
6126				Mean	0.0867				Mean	-3.042		
6127				SD	0.0589				SD	1.769		
6128				95% DL/2 (t) UCL	0.107				95% H-Stat (DL/2) UCL	0.545		
6129												
6130				Maximum Likelihood Estimate(MLE) Method					Log ROS Method			
6131				Mean	0.0832				Mean in Log Scale	-2.544		
6132				SD	0.0643				SD in Log Scale	0.543		
6133				95% MLE (t) UCL	0.105				Mean in Original Scale	0.0906		
6134				95% MLE (Tiku) UCL	0.106				SD in Original Scale	0.0538		
6135									95% Percentile Bootstrap UCL	0.109		
6136									95% BCA Bootstrap UCL	0.113		
6137												
6138	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
6139				k star (bias corrected)	4.35		**Data appear Gamma Distributed at 5% Significance Level**					
6140				Theta Star	0.0226							
6141				nu star	191.4							
6142												
6143				A-D Test Statistic	0.584		**Nonparametric Statistics**					
6144				5% A-D Critical Value	0.746				Kaplan-Meier (KM) Method			
6145				K-S Test Statistic	0.746				Mean	0.0915		
6146				5% K-S Critical Value	0.186				SD	0.0518		
6147	**Data appear Gamma Distributed at 5% Significance Level**								SE of Mean	0.0106		
6148									95% KM (t) UCL	0.11		

6149	**Assuming Gamma Distribution**									95% KM (z) UCL		0.109
6150	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL		0.109
6151	Minimum				0.00915					95% KM (bootstrap t) UCL		0.118
6152	Maximum				0.293					95% KM (BCA) UCL		0.113
6153	Mean				0.0897					95% KM (Percentile Bootstrap) UCL		0.109
6154	Median				0.0858					95% KM (Chebyshev) UCL		0.138
6155	SD				0.055					97.5% KM (Chebyshev) UCL		0.158
6156	k star				2.599					99% KM (Chebyshev) UCL		0.197
6157	Theta star				0.0345							
6158	Nu star				129.9					**Potential UCLs to Use**		
6159	AppChi2				104.6					95% KM (BCA) UCL		0.113
6160	95% Gamma Approximate UCL				0.111							
6161	95% Adjusted Gamma UCL				0.113							
6162	**Note: DL/2 is not a recommended method.**											
6163												
6164												
6165	**Chromium, dissolved (pe-1b)**											
6166												
6167	**General Statistics**											
6168	Number of Valid Observations				1					Number of Distinct Observations		1
6169												
6170												
6171	**Warning: This data set only has 1 observations!**											
6172	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6173	**The data set for variable Chromium, dissolved (pe-1b) was not processed!**											
6174												
6175	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6176	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6177												
6178												
6179												
6180	**Chromium, dissolved (pge-6)**											
6181												
6182	**General Statistics**											
6183	Number of Valid Data				18					Number of Detected Data		16
6184	Number of Distinct Detected Data				15					Number of Non-Detect Data		2
6185										Percent Non-Detects		11.11%
6186												
6187	**Raw Statistics**									**Log-transformed Statistics**		
6188	Minimum Detected				0.024					Minimum Detected		-3.73
6189	Maximum Detected				3.3					Maximum Detected		1.194
6190	Mean of Detected				0.931					Mean of Detected		-0.824
6191	SD of Detected				0.927					SD of Detected		1.604
6192	Minimum Non-Detect				0.02					Minimum Non-Detect		-3.912
6193	Maximum Non-Detect				0.02					Maximum Non-Detect		-3.912
6194												
6195												
6196	**UCL Statistics**											
6197	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
6198	Shapiro Wilk Test Statistic				0.859					Shapiro Wilk Test Statistic		0.863
6199	5% Shapiro Wilk Critical Value				0.887					5% Shapiro Wilk Critical Value		0.887
6200	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**		
6201												

6202	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
6203				DL/2 Substitution Method						DL/2 Substitution Method		
6204				Mean		0.828				Mean		-1.244
6205				SD		0.92				SD		1.94
6206				95% DL/2 (t) UCL		1.206				95% H-Stat (DL/2) UCL		7.012
6207												
6208				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
6209				Mean		0.767				Mean in Log Scale		-1.216
6210				SD		0.977				SD in Log Scale		1.895
6211				95% MLE (t) UCL		1.168				Mean in Original Scale		0.829
6212				95% MLE (Tiku) UCL		1.156				SD in Original Scale		0.92
6213										95% Percentile Bootstrap UCL		1.188
6214										95% BCA Bootstrap UCL		1.291
6215												
6216	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
6217				k star (bias corrected)		0.684	**Data appear Gamma Distributed at 5% Significance Level**					
6218				Theta Star		1.361						
6219				nu star		21.89						
6220												
6221				A-D Test Statistic		0.373	**Nonparametric Statistics**					
6222				5% A-D Critical Value		0.773				Kaplan-Meier (KM) Method		
6223				K-S Test Statistic		0.773				Mean		0.83
6224				5% K-S Critical Value		0.223				SD		0.893
6225	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.217
6226										95% KM (t) UCL		1.208
6227	**Assuming Gamma Distribution**									95% KM (z) UCL		1.187
6228				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1.207
6229				Minimum		1E-09				95% KM (bootstrap t) UCL		1.39
6230				Maximum		3.3				95% KM (BCA) UCL		1.226
6231				Mean		0.827				95% KM (Percentile Bootstrap) UCL		1.191
6232				Median		0.63				95% KM (Chebyshev) UCL		1.777
6233				SD		0.921				97.5% KM (Chebyshev) UCL		2.187
6234				k star		0.245				99% KM (Chebyshev) UCL		2.992
6235				Theta star		3.375						
6236				Nu star		8.824	**Potential UCLs to Use**					
6237				AppChi2		3.221				95% KM (Chebyshev) UCL		1.777
6238				95% Gamma Approximate UCL		2.266						
6239				95% Adjusted Gamma UCL		2.514						
6240	**Note: DL/2 is not a recommended method.**											
6241												
6242												
6243	**Chromium, dissolved (pge-7)**											
6244												
6245	**General Statistics**											
6246				Number of Valid Data		16				Number of Detected Data		15
6247				Number of Distinct Detected Data		11				Number of Non-Detect Data		1
6248										Percent Non-Detects		6.25%
6249												
6250	**Raw Statistics**						**Log-transformed Statistics**					
6251				Minimum Detected		0.742				Minimum Detected		-0.298
6252				Maximum Detected		6.78				Maximum Detected		1.914
6253				Mean of Detected		4.061				Mean of Detected		1.313
6254				SD of Detected		1.342				SD of Detected		0.516

6255				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
6256				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
6257												
6258												
6259	**UCL Statistics**											
6260	**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**						
6261				Shapiro Wilk Test Statistic	0.84					Shapiro Wilk Test Statistic	0.662	
6262				5% Shapiro Wilk Critical Value	0.881					5% Shapiro Wilk Critical Value	0.881	
6263	**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**						
6264												
6265	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
6266				DL/2 Substitution Method						DL/2 Substitution Method		
6267				Mean	3.808					Mean	0.756	
6268				SD	1.647					SD	2.284	
6269				95% DL/2 (t) UCL	4.529					95% H-Stat (DL/2) UCL	270	
6270												
6271				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
6272				Mean	3.771					Mean in Log Scale	1.253	
6273				SD	1.691					SD in Log Scale	0.554	
6274				95% MLE (t) UCL	4.512					Mean in Original Scale	3.896	
6275				95% MLE (Tiku) UCL	4.532					SD in Original Scale	1.455	
6276										95% Percentile Bootstrap UCL	4.448	
6277										95% BCA Bootstrap UCL	4.411	
6278												
6279	**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**						
6280				k star (bias corrected)	4.7	**Data do not follow a Discernable Distribution (0.05)**						
6281				Theta Star	0.864							
6282				nu star	141							
6283												
6284				A-D Test Statistic	1.825	**Nonparametric Statistics**						
6285				5% A-D Critical Value	0.738					Kaplan-Meier (KM) Method		
6286				K-S Test Statistic	0.738					Mean	3.854	
6287				5% K-S Critical Value	0.222					SD	1.49	
6288	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.386	
6289										95% KM (t) UCL	4.53	
6290	**Assuming Gamma Distribution**									95% KM (z) UCL	4.488	
6291				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	4.532	
6292				Minimum	0.742					95% KM (bootstrap t) UCL	4.438	
6293				Maximum	6.78					95% KM (BCA) UCL	4.568	
6294				Mean	3.884					95% KM (Percentile Bootstrap) UCL	4.523	
6295				Median	4.1					95% KM (Chebyshev) UCL	5.535	
6296				SD	1.479					97.5% KM (Chebyshev) UCL	6.262	
6297				k star	3.754					99% KM (Chebyshev) UCL	7.691	
6298				Theta star	1.035							
6299				Nu star	120.1	**Potential UCLs to Use**						
6300				AppChi2	95.81					95% KM (Chebyshev) UCL	5.535	
6301				95% Gamma Approximate UCL	4.869							
6302				95% Adjusted Gamma UCL	4.998							
6303	**Note: DL/2 is not a recommended method.**											
6304												
6305												
6306	**Chromium, dissolved (pge-7br)**											
6307												

	A	B	C	D	E	F	G	H	I	J	K	L
6308	**General Statistics**											
6309					Number of Valid Data	2				Number of Detected Data		0
6310					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
6311										Percent Non-Detects		100.00%
6312												
6313	**Warning: This data set only has 2 observations!**											
6314	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6315	**The data set for variable Chromium, dissolved (pge-7br) was not processed!**											
6316												
6317	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6318	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6319												
6320												
6321												
6322	**Chromium, dissolved (pge-8)**											
6323												
6324	**General Statistics**											
6325					Number of Valid Data	19				Number of Detected Data		6
6326					Number of Distinct Detected Data	6				Number of Non-Detect Data		13
6327										Percent Non-Detects		68.42%
6328												
6329	**Raw Statistics**						**Log-transformed Statistics**					
6330					Minimum Detected	0.0021				Minimum Detected		-6.166
6331					Maximum Detected	0.026				Maximum Detected		-3.65
6332					Mean of Detected	0.0127				Mean of Detected		-4.678
6333					SD of Detected	0.00877				SD of Detected		0.97
6334					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
6335					Maximum Non-Detect	0.8				Maximum Non-Detect		-0.223
6336												
6337	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		19
6338	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
6339	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
6340												
6341	**Warning: There are only 6 Detected Values in this data**											
6342	**Note: It should be noted that even though bootstrap may be performed on this data set**											
6343	**the resulting calculations may not be reliable enough tp draw conclusions**											
6344												
6345	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
6346												
6347												
6348	**UCL Statistics**											
6349	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
6350					Shapiro Wilk Test Statistic	0.935				Shapiro Wilk Test Statistic		0.879
6351					5% Shapiro Wilk Critical Value	0.788				5% Shapiro Wilk Critical Value		0.788
6352	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
6353												
6354	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
6355					DL/2 Substitution Method					DL/2 Substitution Method		
6356					Mean	0.0309				Mean		-4.592
6357					SD	0.0896				SD		1.232
6358					95% DL/2 (t) UCL	0.0665				95% H-Stat (DL/2) UCL		0.0478
6359												
6360					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		

6361	MLE method failed to converge properly									Mean in Log Scale		-5.092
6362										SD in Log Scale		0.859
6363										Mean in Original Scale		0.00847
6364										SD in Original Scale		0.00672
6365										95% Percentile Bootstrap UCL		0.0111
6366										95% BCA Bootstrap UCL		0.0114
6367												
6368	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
6369				k star (bias corrected)	0.998		Data appear Normal at 5% Significance Level					
6370				Theta Star	0.0127							
6371				nu star	11.98							
6372												
6373				A-D Test Statistic	0.413		Nonparametric Statistics					
6374				5% A-D Critical Value	0.706		Kaplan-Meier (KM) Method					
6375				K-S Test Statistic	0.706		Mean					0.00963
6376				5% K-S Critical Value	0.337		SD					0.00713
6377	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.00277
6378							95% KM (t) UCL					0.0144
6379	Assuming Gamma Distribution						95% KM (z) UCL					0.0142
6380				Gamma ROS Statistics using Extrapolated Data			95% KM (jackknife) UCL					0.0146
6381				Minimum	0.0003944		95% KM (bootstrap t) UCL					0.0143
6382				Maximum	0.026		95% KM (BCA) UCL					0.0156
6383				Mean	0.012		95% KM (Percentile Bootstrap) UCL					0.0153
6384				Median	0.013		95% KM (Chebyshev) UCL					0.0217
6385				SD	0.00816		97.5% KM (Chebyshev) UCL					0.0269
6386				k star	1.075		99% KM (Chebyshev) UCL					0.0372
6387				Theta star	0.0112							
6388				Nu star	40.84		Potential UCLs to Use					
6389				AppChi2	27.2		95% KM (t) UCL					0.0144
6390				95% Gamma Approximate UCL	0.0181		95% KM (Percentile Bootstrap) UCL					0.0153
6391				95% Adjusted Gamma UCL	0.0188							
6392	Note: DL/2 is not a recommended method.											
6393												
6394												
6395	Chromium, dissolved (pt-1d)											
6396												
6397	General Statistics											
6398				Number of Valid Observations	2		Number of Distinct Observations					2
6399												
6400												
6401	Warning: This data set only has 2 observations!											
6402	Data set is too small to compute reliable and meaningful statistics and estimates!											
6403	The data set for variable Chromium, dissolved (pt-1d) was not processed!											
6404												
6405	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
6406	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
6407												
6408												
6409												
6410	Chromium, dissolved (pt-1m)											
6411												
6412	General Statistics											
6413				Number of Valid Data	2		Number of Detected Data					1

6414			Number of Distinct Detected Data		1			Number of Non-Detect Data			1	
6415								Percent Non-Detects			50.00%	
6416												
6417					Warning: This data set only has 2 observations!							
6418					Data set is too small to compute reliable and meaningful statistics and estimates!							
6419					The data set for variable Chromium, dissolved (pt-1m) was not processed!							
6420												
6421					It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
6422					If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
6423												
6424												
6425												
6426	Chromium, dissolved (pt-1s)											
6427												
6428					General Statistics							
6429			Number of Valid Data		2			Number of Detected Data			0	
6430			Number of Distinct Detected Data		0			Number of Non-Detect Data			2	
6431								Percent Non-Detects			100.00%	
6432												
6433					Warning: This data set only has 2 observations!							
6434					Data set is too small to compute reliable and meaningful statistics and estimates!							
6435					The data set for variable Chromium, dissolved (pt-1s) was not processed!							
6436												
6437					It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
6438					If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
6439												
6440												
6441												
6442	Chromium, dissolved (pt-2d)											
6443												
6444					General Statistics							
6445			Number of Valid Observations		2			Number of Distinct Observations			2	
6446												
6447												
6448					Warning: This data set only has 2 observations!							
6449					Data set is too small to compute reliable and meaningful statistics and estimates!							
6450					The data set for variable Chromium, dissolved (pt-2d) was not processed!							
6451												
6452					It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
6453					If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
6454												
6455												
6456												
6457	Chromium, dissolved (pt-2m)											
6458												
6459					General Statistics							
6460			Number of Valid Data		2			Number of Detected Data			1	
6461			Number of Distinct Detected Data		1			Number of Non-Detect Data			1	
6462								Percent Non-Detects			50.00%	
6463												
6464					Warning: This data set only has 2 observations!							
6465					Data set is too small to compute reliable and meaningful statistics and estimates!							
6466					The data set for variable Chromium, dissolved (pt-2m) was not processed!							

	A	B	C	D	E	F	G	H	I	J	K	L
6467												
6468	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6469	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6470												
6471												
6472												
6473	**Chromium, dissolved (pt-2s)**											
6474												
6475	**General Statistics**											
6476					Number of Valid Data	2			Number of Detected Data			0
6477					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
6478									Percent Non-Detects			100.00%
6479												
6480	**Warning: This data set only has 2 observations!**											
6481	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6482	**The data set for variable Chromium, dissolved (pt-2s) was not processed!**											
6483												
6484	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6485	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6486												
6487												
6488												
6489	**Chromium, dissolved (pt-3d)**											
6490												
6491	**General Statistics**											
6492					Number of Valid Observations	2			Number of Distinct Observations			2
6493												
6494												
6495	**Warning: This data set only has 2 observations!**											
6496	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6497	**The data set for variable Chromium, dissolved (pt-3d) was not processed!**											
6498												
6499	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6500	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6501												
6502												
6503												
6504	**Chromium, dissolved (pt-3m)**											
6505												
6506	**General Statistics**											
6507					Number of Valid Data	2			Number of Detected Data			0
6508					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
6509									Percent Non-Detects			100.00%
6510												
6511	**Warning: This data set only has 2 observations!**											
6512	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6513	**The data set for variable Chromium, dissolved (pt-3m) was not processed!**											
6514												
6515	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6516	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6517												
6518												
6519												

	A	B	C	D	E	F	G	H	I	J	K	L
6520	**Chromium, dissolved (pt-3s)**											
6521												
6522	**General Statistics**											
6523	Number of Valid Observations					2	Number of Distinct Observations					2
6524												
6525												
6526	**Warning: This data set only has 2 observations!**											
6527	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6528	**The data set for variable Chromium, dissolved (pt-3s) was not processed!**											
6529												
6530	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6531	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6532												
6533												
6534												
6535	**Chromium, dissolved (pt-4d)**											
6536												
6537	**General Statistics**											
6538	Number of Valid Observations					2	Number of Distinct Observations					2
6539												
6540												
6541	**Warning: This data set only has 2 observations!**											
6542	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6543	**The data set for variable Chromium, dissolved (pt-4d) was not processed!**											
6544												
6545	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6546	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6547												
6548												
6549												
6550	**Chromium, dissolved (pt-4m)**											
6551												
6552	**General Statistics**											
6553	Number of Valid Data					2	Number of Detected Data					1
6554	Number of Distinct Detected Data					1	Number of Non-Detect Data					1
6555							Percent Non-Detects					50.00%
6556												
6557	**Warning: This data set only has 2 observations!**											
6558	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6559	**The data set for variable Chromium, dissolved (pt-4m) was not processed!**											
6560												
6561	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6562	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6563												
6564												
6565												
6566	**Chromium, dissolved (pt-4s)**											
6567												
6568	**General Statistics**											
6569	Number of Valid Observations					2	Number of Distinct Observations					2
6570												
6571												
6572	**Warning: This data set only has 2 observations!**											

	A	B	C	D	E	F	G	H	I	J	K	L
6573	Data set is too small to compute reliable and meaningful statistics and estimates!											
6574	The data set for variable Chromium, dissolved (pt-4s) was not processed!											
6575												
6576	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
6577	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
6578												
6579												
6580												
6581	Chromium, dissolved (pt-5d)											
6582												
6583	General Statistics											
6584						Number of Valid Data	2			Number of Detected Data	1	
6585						Number of Distinct Detected Data	1			Number of Non-Detect Data	1	
6586										Percent Non-Detects	50.00%	
6587												
6588	Warning: This data set only has 2 observations!											
6589	Data set is too small to compute reliable and meaningful statistics and estimates!											
6590	The data set for variable Chromium, dissolved (pt-5d) was not processed!											
6591												
6592	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
6593	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
6594												
6595												
6596												
6597	Chromium, dissolved (pt-5m)											
6598												
6599	General Statistics											
6600						Number of Valid Data	2			Number of Detected Data	0	
6601						Number of Distinct Detected Data	0			Number of Non-Detect Data	2	
6602										Percent Non-Detects	100.00%	
6603												
6604	Warning: This data set only has 2 observations!											
6605	Data set is too small to compute reliable and meaningful statistics and estimates!											
6606	The data set for variable Chromium, dissolved (pt-5m) was not processed!											
6607												
6608	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
6609	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
6610												
6611												
6612												
6613	Chromium, dissolved (pt-5s)											
6614												
6615	General Statistics											
6616						Number of Valid Data	2			Number of Detected Data	1	
6617						Number of Distinct Detected Data	1			Number of Non-Detect Data	1	
6618										Percent Non-Detects	50.00%	
6619												
6620	Warning: This data set only has 2 observations!											
6621	Data set is too small to compute reliable and meaningful statistics and estimates!											
6622	The data set for variable Chromium, dissolved (pt-5s) was not processed!											
6623												
6624	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
6625	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											

	A	B	C	D	E	F	G	H	I	J	K	L
6626												
6627												
6628												
6629	**Chromium, dissolved (pt-6d)**											
6630												
6631						**General Statistics**							
6632					Number of Valid Observations	2			Number of Distinct Observations			2
6633												
6634												
6635						**Warning: This data set only has 2 observations!**							
6636						**Data set is too small to compute reliable and meaningful statistics and estimates!**							
6637						**The data set for variable Chromium, dissolved (pt-6d) was not processed!**							
6638												
6639						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
6640						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
6641												
6642												
6643												
6644	**Chromium, dissolved (pt-6m)**											
6645												
6646						**General Statistics**							
6647					Number of Valid Data	2			Number of Detected Data			0
6648					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
6649									Percent Non-Detects			100.00%
6650												
6651						**Warning: This data set only has 2 observations!**							
6652						**Data set is too small to compute reliable and meaningful statistics and estimates!**							
6653						**The data set for variable Chromium, dissolved (pt-6m) was not processed!**							
6654												
6655						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
6656						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
6657												
6658												
6659												
6660	**Chromium, dissolved (pt-6s)**											
6661												
6662						**General Statistics**							
6663					Number of Valid Data	2			Number of Detected Data			1
6664					Number of Distinct Detected Data	1			Number of Non-Detect Data			1
6665									Percent Non-Detects			50.00%
6666												
6667						**Warning: This data set only has 2 observations!**							
6668						**Data set is too small to compute reliable and meaningful statistics and estimates!**							
6669						**The data set for variable Chromium, dissolved (pt-6s) was not processed!**							
6670												
6671						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
6672						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
6673												
6674												
6675												
6676	**Chromium, dissolved (pt-7d)**											
6677												
6678						**General Statistics**							

	A	B	C	D	E	F	G	H	I	J	K	L
6679					Number of Valid Observations	1				Number of Distinct Observations		1
6680												
6681												
6682						Warning: This data set only has 1 observations!						
6683						Data set is too small to compute reliable and meaningful statistics and estimates!						
6684						The data set for variable Chromium, dissolved (pt-7d) was not processed!						
6685												
6686						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
6687						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
6688												
6689												
6690												
6691	Chromium, dissolved (pt-7m)											
6692												
6693						General Statistics						
6694					Number of Valid Observations	1				Number of Distinct Observations		1
6695												
6696												
6697						Warning: This data set only has 1 observations!						
6698						Data set is too small to compute reliable and meaningful statistics and estimates!						
6699						The data set for variable Chromium, dissolved (pt-7m) was not processed!						
6700												
6701						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
6702						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
6703												
6704												
6705												
6706	Chromium, dissolved (pt-7s)											
6707												
6708						General Statistics						
6709					Number of Valid Observations	1				Number of Distinct Observations		1
6710												
6711												
6712						Warning: This data set only has 1 observations!						
6713						Data set is too small to compute reliable and meaningful statistics and estimates!						
6714						The data set for variable Chromium, dissolved (pt-7s) was not processed!						
6715												
6716						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
6717						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
6718												
6719												
6720												
6721	Chromium, dissolved (pt-8d)											
6722												
6723						General Statistics						
6724					Number of Valid Observations	1				Number of Distinct Observations		1
6725												
6726												
6727						Warning: This data set only has 1 observations!						
6728						Data set is too small to compute reliable and meaningful statistics and estimates!						
6729						The data set for variable Chromium, dissolved (pt-8d) was not processed!						
6730												
6731						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						

	A	B	C	D	E	F	G	H	I	J	K	L
6732	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
6733												
6734												
6735												
6736	Chromium, dissolved (pt-8m)											
6737												
6738	General Statistics											
6739					Number of Valid Observations	1			Number of Distinct Observations	1		
6740												
6741												
6742	Warning: This data set only has 1 observations!											
6743	Data set is too small to compute reliable and meaningful statistics and estimates!											
6744	The data set for variable Chromium, dissolved (pt-8m) was not processed!											
6745												
6746	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
6747	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
6748												
6749												
6750												
6751	Chromium, dissolved (pt-8s)											
6752												
6753	General Statistics											
6754					Number of Valid Observations	1			Number of Distinct Observations	1		
6755												
6756												
6757	Warning: This data set only has 1 observations!											
6758	Data set is too small to compute reliable and meaningful statistics and estimates!											
6759	The data set for variable Chromium, dissolved (pt-8s) was not processed!											
6760												
6761	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
6762	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
6763												
6764												
6765												
6766	Chromium, dissolved (pt-9d)											
6767												
6768	General Statistics											
6769					Number of Valid Observations	1			Number of Distinct Observations	1		
6770												
6771												
6772	Warning: This data set only has 1 observations!											
6773	Data set is too small to compute reliable and meaningful statistics and estimates!											
6774	The data set for variable Chromium, dissolved (pt-9d) was not processed!											
6775												
6776	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
6777	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
6778												
6779												
6780												
6781	Chromium, dissolved (pt-9m)											
6782												
6783	General Statistics											
6784					Number of Valid Observations	1			Number of Distinct Observations	1		

	A	B	C	D	E	F	G	H	I	J	K	L
6785												
6786												
6787						Warning: This data set only has 1 observations!							
6788						Data set is too small to compute reliable and meaningful statistics and estimates!						
6789						The data set for variable Chromium, dissolved (pt-9m) was not processed!						
6790												
6791						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
6792						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
6793												
6794												
6795												
6796	Chromium, dissolved (pt-9s)											
6797												
6798						General Statistics						
6799					Number of Valid Observations	1			Number of Distinct Observations	1		
6800												
6801												
6802						Warning: This data set only has 1 observations!						
6803						Data set is too small to compute reliable and meaningful statistics and estimates!						
6804						The data set for variable Chromium, dissolved (pt-9s) was not processed!						
6805												
6806						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
6807						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
6808												
6809												
6810												
6811	Chromium, dissolved (pti-1d)											
6812												
6813						General Statistics						
6814					Number of Valid Observations	2			Number of Distinct Observations	2		
6815												
6816												
6817						Warning: This data set only has 2 observations!						
6818						Data set is too small to compute reliable and meaningful statistics and estimates!						
6819						The data set for variable Chromium, dissolved (pti-1d) was not processed!						
6820												
6821						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
6822						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
6823												
6824												
6825												
6826	Chromium, dissolved (pti-1m)											
6827												
6828						General Statistics						
6829					Number of Valid Observations	2			Number of Distinct Observations	2		
6830												
6831												
6832						Warning: This data set only has 2 observations!						
6833						Data set is too small to compute reliable and meaningful statistics and estimates!						
6834						The data set for variable Chromium, dissolved (pti-1m) was not processed!						
6835												
6836						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
6837						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						

	A	B	C	D	E	F	G	H	I	J	K	L
6838												
6839												
6840												
6841	**Chromium, dissolved (pti-1s)**											
6842												
6843	**General Statistics**											
6844					Number of Valid Data	2			Number of Detected Data			1
6845					Number of Distinct Detected Data	1			Number of Non-Detect Data			1
6846									Percent Non-Detects			50.00%
6847												
6848	**Warning: This data set only has 2 observations!**											
6849	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6850	**The data set for variable Chromium, dissolved (pti-1s) was not processed!**											
6851												
6852	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6853	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6854												
6855												
6856												
6857	**Chromium, dissolved (ptr-1)**											
6858												
6859	**General Statistics**											
6860					Number of Valid Observations	1			Number of Distinct Observations			1
6861												
6862												
6863	**Warning: This data set only has 1 observations!**											
6864	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6865	**The data set for variable Chromium, dissolved (ptr-1) was not processed!**											
6866												
6867	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6868	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6869												
6870												
6871												
6872	**Chromium, dissolved (ptr-2)**											
6873												
6874	**General Statistics**											
6875					Number of Valid Observations	1			Number of Distinct Observations			1
6876												
6877												
6878	**Warning: This data set only has 1 observations!**											
6879	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6880	**The data set for variable Chromium, dissolved (ptr-2) was not processed!**											
6881												
6882	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6883	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6884												
6885												
6886												
6887	**Chromium, dissolved (tw-1)**											
6888												
6889	**General Statistics**											
6890					Number of Valid Observations	6			Number of Distinct Observations			6

6891												
6892	**Raw Statistics**						**Log-transformed Statistics**					
6893					Minimum	2.45					Minimum of Log Data	0.896
6894					Maximum	4.34					Maximum of Log Data	1.468
6895					Mean	3.798					Mean of log Data	1.318
6896					Median	3.995					SD of log Data	0.212
6897					SD	0.691						
6898					Coefficient of Variation	0.182						
6899					Skewness	-1.996						
6900												
6901												
6902	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
6903												
6904	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
6905	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6906												
6907												
6908	**Warning: There are only 6 Values in this data**											
6909	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
6910	**the resulting calculations may not be reliable enough to draw conclusions**											
6911												
6912	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
6913												
6914	**Relevant UCL Statistics**											
6915	**Normal Distribution Test**						**Lognormal Distribution Test**					
6916					Shapiro Wilk Test Statistic	0.767					Shapiro Wilk Test Statistic	0.717
6917					Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788
6918	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
6919												
6920	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
6921					95% Student's-t UCL	4.366					95% H-UCL	4.657
6922	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	5.243
6923					95% Adjusted-CLT UCL	4.017					97.5% Chebyshev (MVUE) UCL	5.866
6924					95% Modified-t UCL	4.328					99% Chebyshev (MVUE) UCL	7.088
6925												
6926	**Gamma Distribution Test**						**Data Distribution**					
6927					k star (bias corrected)	14.94	**Data do not follow a Discernable Distribution (0.05)**					
6928					Theta Star	0.254						
6929					nu star	179.3						
6930					Approximate Chi Square Value (.05)	149.4	**Nonparametric Statistics**					
6931					Adjusted Level of Significance	0.0122					95% CLT UCL	4.262
6932					Adjusted Chi Square Value	139.5					95% Jackknife UCL	4.366
6933											95% Standard Bootstrap UCL	4.221
6934					Anderson-Darling Test Statistic	0.839					95% Bootstrap-t UCL	4.162
6935					Anderson-Darling 5% Critical Value	0.697					95% Hall's Bootstrap UCL	4.078
6936					Kolmogorov-Smirnov Test Statistic	0.353					95% Percentile Bootstrap UCL	4.147
6937					Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	4.112
6938	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	5.027
6939											97.5% Chebyshev(Mean, Sd) UCL	5.559
6940	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	6.604
6941					95% Approximate Gamma UCL	4.561						
6942					95% Adjusted Gamma UCL	4.885						
6943												

6944	**Potential UCL to Use**									Use 95% Student's-t UCL	4.366	
6945										or 95% Modified-t UCL	4.328	
6946	**Recommended UCL exceeds the maximum observation**											
6947												
6948												
6949	**Chromium, dissolved (tw-2d)**											
6950												
6951	**General Statistics**											
6952	Number of Valid Observations	13					Number of Distinct Observations	13				
6953												
6954	**Raw Statistics**						**Log-transformed Statistics**					
6955	Minimum	0.228					Minimum of Log Data	-1.478				
6956	Maximum	6.98					Maximum of Log Data	1.943				
6957	Mean	3.339					Mean of log Data	0.824				
6958	Median	1.98					SD of log Data	1.032				
6959	SD	2.494										
6960	Coefficient of Variation	0.747										
6961	Skewness	0.238										
6962												
6963	**Relevant UCL Statistics**											
6964	**Normal Distribution Test**						**Lognormal Distribution Test**					
6965	Shapiro Wilk Test Statistic	0.848					Shapiro Wilk Test Statistic	0.879				
6966	Shapiro Wilk Critical Value	0.866					Shapiro Wilk Critical Value	0.866				
6967	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
6968												
6969	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
6970	95% Student's-t UCL	4.572					95% H-UCL	9.223				
6971	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	8.616				
6972	95% Adjusted-CLT UCL	4.526					97.5% Chebyshev (MVUE) UCL	10.76				
6973	95% Modified-t UCL	4.58					99% Chebyshev (MVUE) UCL	14.96				
6974												
6975	**Gamma Distribution Test**						**Data Distribution**					
6976	k star (bias corrected)	1.17					**Data appear Gamma Distributed at 5% Significance Level**					
6977	Theta Star	2.854										
6978	nu star	30.42										
6979	Approximate Chi Square Value (.05)	18.83					**Nonparametric Statistics**					
6980	Adjusted Level of Significance	0.0301					95% CLT UCL	4.477				
6981	Adjusted Chi Square Value	17.54					95% Jackknife UCL	4.572				
6982							95% Standard Bootstrap UCL	4.444				
6983	Anderson-Darling Test Statistic	0.716					95% Bootstrap-t UCL	4.625				
6984	Anderson-Darling 5% Critical Value	0.751					95% Hall's Bootstrap UCL	4.364				
6985	Kolmogorov-Smirnov Test Statistic	0.229					95% Percentile Bootstrap UCL	4.491				
6986	Kolmogorov-Smirnov 5% Critical Value	0.241					95% BCA Bootstrap UCL	4.477				
6987	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	6.355				
6988							97.5% Chebyshev(Mean, Sd) UCL	7.659				
6989	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	10.22				
6990	95% Approximate Gamma UCL	5.396										
6991	95% Adjusted Gamma UCL	5.793										
6992												
6993	**Potential UCL to Use**						Use 95% Approximate Gamma UCL	5.396				
6994												
6995												
6996	**Chromium, dissolved (tw-2s)**											

6997												
6998	**General Statistics**											
6999	Number of Valid Observations				10		Number of Distinct Observations					10
7000												
7001	**Raw Statistics**						**Log-transformed Statistics**					
7002	Minimum				1.22		Minimum of Log Data					0.199
7003	Maximum				6.82		Maximum of Log Data					1.92
7004	Mean				3.879		Mean of log Data					1.244
7005	Median				3.76		SD of log Data					0.524
7006	SD				1.783							
7007	Coefficient of Variation				0.46							
7008	Skewness				0.258							
7009												
7010	**Relevant UCL Statistics**											
7011	**Normal Distribution Test**						**Lognormal Distribution Test**					
7012	Shapiro Wilk Test Statistic				0.972		Shapiro Wilk Test Statistic					0.958
7013	Shapiro Wilk Critical Value				0.842		Shapiro Wilk Critical Value					0.842
7014	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
7015												
7016	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
7017	95% Student's-t UCL				4.913		95% H-UCL					5.906
7018	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					6.813
7019	95% Adjusted-CLT UCL				4.856		97.5% Chebyshev (MVUE) UCL					8.064
7020	95% Modified-t UCL				4.92		99% Chebyshev (MVUE) UCL					10.52
7021												
7022	**Gamma Distribution Test**						**Data Distribution**					
7023	k star (bias corrected)				3.325		**Data appear Normal at 5% Significance Level**					
7024	Theta Star				1.167							
7025	nu star				66.5							
7026	Approximate Chi Square Value (.05)				48.74		**Nonparametric Statistics**					
7027	Adjusted Level of Significance				0.0267		95% CLT UCL					4.807
7028	Adjusted Chi Square Value				46.1		95% Jackknife UCL					4.913
7029							95% Standard Bootstrap UCL					4.768
7030	Anderson-Darling Test Statistic				0.169		95% Bootstrap-t UCL					4.999
7031	Anderson-Darling 5% Critical Value				0.729		95% Hall's Bootstrap UCL					4.841
7032	Kolmogorov-Smirnov Test Statistic				0.128		95% Percentile Bootstrap UCL					4.772
7033	Kolmogorov-Smirnov 5% Critical Value				0.268		95% BCA Bootstrap UCL					4.857
7034	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					6.337
7035							97.5% Chebyshev(Mean, Sd) UCL					7.401
7036	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					9.49
7037	95% Approximate Gamma UCL				5.293							
7038	95% Adjusted Gamma UCL				5.595							
7039												
7040	**Potential UCL to Use**						Use 95% Student's-t UCL					4.913
7041												
7042												
7043	**Chromium, dissolved (tw-3d)**											
7044												
7045	**General Statistics**											
7046	Number of Valid Observations				22		Number of Distinct Observations					21
7047												
7048	**Raw Statistics**						**Log-transformed Statistics**					
7049	Minimum				1.8		Minimum of Log Data					0.588

7050					Maximum	4.72					Maximum of Log Data	1.552
7051					Mean	2.649					Mean of log Data	0.952
7052					Median	2.48					SD of log Data	0.208
7053					SD	0.61						
7054					Coefficient of Variation	0.23						
7055					Skewness	1.813						
7056												
7057	**Relevant UCL Statistics**											
7058	**Normal Distribution Test**						**Lognormal Distribution Test**					
7059					Shapiro Wilk Test Statistic	0.849					Shapiro Wilk Test Statistic	0.938
7060					Shapiro Wilk Critical Value	0.911					Shapiro Wilk Critical Value	0.911
7061	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
7062												
7063	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
7064					95% Student's-t UCL	2.873					95% H-UCL	2.871
7065	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	3.162
7066					95% Adjusted-CLT UCL	2.917					97.5% Chebyshev (MVUE) UCL	3.386
7067					95% Modified-t UCL	2.881					99% Chebyshev (MVUE) UCL	3.824
7068												
7069	**Gamma Distribution Test**						**Data Distribution**					
7070					k star (bias corrected)	19.88	**Data appear Gamma Distributed at 5% Significance Level**					
7071					Theta Star	0.133						
7072					nu star	874.8						
7073					Approximate Chi Square Value (.05)	807.2	**Nonparametric Statistics**					
7074					Adjusted Level of Significance	0.0386					95% CLT UCL	2.863
7075					Adjusted Chi Square Value	802.3					95% Jackknife UCL	2.873
7076											95% Standard Bootstrap UCL	2.857
7077					Anderson-Darling Test Statistic	0.519					95% Bootstrap-t UCL	2.942
7078					Anderson-Darling 5% Critical Value	0.741					95% Hall's Bootstrap UCL	3.139
7079					Kolmogorov-Smirnov Test Statistic	0.127					95% Percentile Bootstrap UCL	2.87
7080					Kolmogorov-Smirnov 5% Critical Value	0.185					95% BCA Bootstrap UCL	2.916
7081	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	3.216
7082											97.5% Chebyshev(Mean, Sd) UCL	3.461
7083	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	3.943
7084					95% Approximate Gamma UCL	2.871						
7085					95% Adjusted Gamma UCL	2.888						
7086												
7087	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	2.871
7088												
7089												
7090	**Chromium, dissolved (tw-4)**											
7091												
7092	**General Statistics**											
7093					Number of Valid Observations	6					Number of Distinct Observations	6
7094												
7095	**Raw Statistics**						**Log-transformed Statistics**					
7096					Minimum	0.0041					Minimum of Log Data	-5.497
7097					Maximum	0.0369					Maximum of Log Data	-3.3
7098					Mean	0.0217					Mean of log Data	-4.11
7099					Median	0.0249					SD of log Data	0.927
7100					SD	0.0136						
7101					Coefficient of Variation	0.627						
7102					Skewness	-0.471						

	A	B	C	D	E	F	G	H	I	J	K	L
7103												
7104												
7105	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
7106												
7107	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
7108	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
7109												
7110												
7111	**Warning: There are only 6 Values in this data**											
7112	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
7113	**the resulting calculations may not be reliable enough to draw conclusions**											
7114												
7115	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
7116												
7117	**Relevant UCL Statistics**											
7118	**Normal Distribution Test**						**Lognormal Distribution Test**					
7119	Shapiro Wilk Test Statistic					0.898	Shapiro Wilk Test Statistic					0.825
7120	Shapiro Wilk Critical Value					0.788	Shapiro Wilk Critical Value					0.788
7121	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
7122												
7123	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
7124	95% Student's-t UCL					0.0328	95% H-UCL					0.125
7125	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0607
7126	95% Adjusted-CLT UCL					0.0296	97.5% Chebyshev (MVUE) UCL					0.0769
7127	95% Modified-t UCL					0.0326	99% Chebyshev (MVUE) UCL					0.109
7128												
7129	**Gamma Distribution Test**						**Data Distribution**					
7130	k star (bias corrected)					1.089	**Data appear Normal at 5% Significance Level**					
7131	Theta Star					0.0199						
7132	nu star					13.06						
7133	Approximate Chi Square Value (.05)					5.936	**Nonparametric Statistics**					
7134	Adjusted Level of Significance					0.0122	95% CLT UCL					0.0308
7135	Adjusted Chi Square Value					4.322	95% Jackknife UCL					0.0328
7136							95% Standard Bootstrap UCL					0.03
7137	Anderson-Darling Test Statistic					0.553	95% Bootstrap-t UCL					0.0309
7138	Anderson-Darling 5% Critical Value					0.705	95% Hall's Bootstrap UCL					0.028
7139	Kolmogorov-Smirnov Test Statistic					0.299	95% Percentile Bootstrap UCL					0.0298
7140	Kolmogorov-Smirnov 5% Critical Value					0.336	95% BCA Bootstrap UCL					0.0288
7141	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.0458
7142							97.5% Chebyshev(Mean, Sd) UCL					0.0563
7143	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.0768
7144	95% Approximate Gamma UCL					0.0476						
7145	95% Adjusted Gamma UCL					0.0654						
7146												
7147	**Potential UCL to Use**						Use 95% Student's-t UCL					0.0328
7148												
7149												
7150	**Chromium, dissolved (tw-5)**											
7151												
7152	**General Statistics**											
7153	Number of Valid Data					4	Number of Detected Data					3
7154	Number of Distinct Detected Data					3	Number of Non-Detect Data					1
7155							Percent Non-Detects					25.00%

	A	B	C	D	E	F	G	H	I	J	K	L
7156												
7157	Warning: This data set only has 4 observations!											
7158	Data set is too small to compute reliable and meaningful statistics and estimates!											
7159	The data set for variable Chromium, dissolved (tw-5) was not processed!											
7160												
7161	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
7162	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
7163												
7164												

1				General UCL Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	Cobalt, dissolved (1)											
10												
11						General Statistics						
12						Number of Valid Data	149	Number of Detected Data	4			
13						Number of Distinct Detected Data	4	Number of Non-Detect Data	145			
14								Percent Non-Detects	97.32%			
15												
16						Raw Statistics		Log-transformed Statistics				
17						Minimum Detected	0.00101	Minimum Detected	-6.898			
18						Maximum Detected	0.00164	Maximum Detected	-6.413			
19						Mean of Detected	0.00136	Mean of Detected	-6.619			
20						SD of Detected	0.0002611	SD of Detected	0.203			
21						Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908			
22						Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908			
23												
24												
25						Warning: There are only 4 Distinct Detected Values in this data						
26						Note: It should be noted that even though bootstrap may be performed on this data set						
27						the resulting calculations may not be reliable enough tp draw conclusions						
28												
29						It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.						
30												
31												
32						UCL Statistics						
33						Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only				
34						Lilliefors Test Statistic	0.967	Lilliefors Test Statistic	0.94			
35						5% Lilliefors Critical Value	0.748	5% Lilliefors Critical Value	0.748			
36						Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level				
37												
38						Assuming Normal Distribution		Assuming Lognormal Distribution				
39						DL/2 Substitution Method		DL/2 Substitution Method				
40						Mean	0.000523	Mean	-7.575			
41						SD	0.0001436	SD	0.162			
42						95% DL/2 (t) UCL	0.0005424	95% H-Stat (DL/2) UCL	0.0005262			
43												
44						Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method				
45						MLE yields a negative mean		Mean in Log Scale	-8.452			
46								SD in Log Scale	0.797			
47								Mean in Original Scale	0.0002922			
48								SD in Original Scale	0.0002621			
49								95% Percentile Bootstrap UCL	0.0003288			
50								95% BCA Bootstrap UCL	0.0003317			
51												
52						Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only				
53						k star (bias corrected)	8.57	Data appear Normal at 5% Significance Level				

54					Theta Star	0.0001581						
55					nu star	68.56						
56												
57					A-D Test Statistic	0.294	**Nonparametric Statistics**					
58					5% A-D Critical Value	0.657					Kaplan-Meier (KM) Method	
59					K-S Test Statistic	0.657					Mean	0.00102
60					5% K-S Critical Value	0.394					SD	6.695E-05
61	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	6.333E-06
62											95% KM (t) UCL	0.00103
63	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00103
64					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00124
65					Minimum	0.00101					95% KM (bootstrap t) UCL	0.00103
66					Maximum	0.00408					95% KM (BCA) UCL	0.00142
67					Mean	0.00324					95% KM (Percentile Bootstrap) UCL	0.00142
68					Median	0.00344					95% KM (Chebyshev) UCL	0.00105
69					SD	0.0007255					97.5% KM (Chebyshev) UCL	0.00106
70					k star	14.88					99% KM (Chebyshev) UCL	0.00108
71					Theta star	0.0002177						
72					Nu star	4436	**Potential UCLs to Use**					
73					AppChi2	4282					95% KM (t) UCL	0.00103
74					95% Gamma Approximate UCL	0.00336					95% KM (Percentile Bootstrap) UCL	0.00142
75					95% Adjusted Gamma UCL	N/A						
76	**Note: DL/2 is not a recommended method.**											
77												
78												
79	**Cobalt, dissolved (cw-1d)**											
80												
81	**General Statistics**											
82					Number of Valid Data	7					Number of Detected Data	0
83					Number of Distinct Detected Data	0					Number of Non-Detect Data	7
84											Percent Non-Detects	100.00%
85												
86	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
87	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
88	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
89												
90	**The data set for variable Cobalt, dissolved (cw-1d) was not processed!**											
91												
92												
93												
94	**Cobalt, dissolved (cw-1m)**											
95												
96	**General Statistics**											
97					Number of Valid Data	7					Number of Detected Data	0
98					Number of Distinct Detected Data	0					Number of Non-Detect Data	7
99											Percent Non-Detects	100.00%
100												
101	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
102	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
103	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
104												
105	**The data set for variable Cobalt, dissolved (cw-1m) was not processed!**											
106												

	A	B	C	D	E	F	G	H	I	J	K	L
107												
108												
109	**Cobalt, dissolved (cw-2d)**											
110												
111	**General Statistics**											
112	Number of Valid Data					7	Number of Detected Data					0
113	Number of Distinct Detected Data					0	Number of Non-Detect Data					7
114							Percent Non-Detects					100.00%
115												
116	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
117	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
118	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
119												
120	**The data set for variable Cobalt, dissolved (cw-2d) was not processed!**											
121												
122												
123												
124	**Cobalt, dissolved (cw-2m)**											
125												
126	**General Statistics**											
127	Number of Valid Data					7	Number of Detected Data					0
128	Number of Distinct Detected Data					0	Number of Non-Detect Data					7
129							Percent Non-Detects					100.00%
130												
131	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
132	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
133	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
134												
135	**The data set for variable Cobalt, dissolved (cw-2m) was not processed!**											
136												
137												
138												
139	**Cobalt, dissolved (cw-3d)**											
140												
141	**General Statistics**											
142	Number of Valid Data					7	Number of Detected Data					0
143	Number of Distinct Detected Data					0	Number of Non-Detect Data					7
144							Percent Non-Detects					100.00%
145												
146	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
147	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
148	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
149												
150	**The data set for variable Cobalt, dissolved (cw-3d) was not processed!**											
151												
152												
153												
154	**Cobalt, dissolved (cw-3m)**											
155												
156	**General Statistics**											
157	Number of Valid Data					7	Number of Detected Data					0
158	Number of Distinct Detected Data					0	Number of Non-Detect Data					7
159							Percent Non-Detects					100.00%

	A	B	C	D	E	F	G	H	I	J	K	L
160												
161	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
162	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
163	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
164												
165	The data set for variable Cobalt, dissolved (cw-3m) was not processed!											
166												
167												
168												
169	Cobalt, dissolved (cw-4d)											
170												
171	General Statistics											
172					Number of Valid Data	7			Number of Detected Data	0		
173					Number of Distinct Detected Data	0			Number of Non-Detect Data	7		
174									Percent Non-Detects	100.00%		
175												
176	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
177	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
178	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
179												
180	The data set for variable Cobalt, dissolved (cw-4d) was not processed!											
181												
182												
183												
184	Cobalt, dissolved (cw-4m)											
185												
186	General Statistics											
187					Number of Valid Data	7			Number of Detected Data	0		
188					Number of Distinct Detected Data	0			Number of Non-Detect Data	7		
189									Percent Non-Detects	100.00%		
190												
191	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
192	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
193	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
194												
195	The data set for variable Cobalt, dissolved (cw-4m) was not processed!											
196												
197												
198												
199	Cobalt, dissolved (mw-1)											
200												
201	General Statistics											
202					Number of Valid Data	2			Number of Detected Data	0		
203					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
204									Percent Non-Detects	100.00%		
205												
206	Warning: This data set only has 2 observations!											
207	Data set is too small to compute reliable and meaningful statistics and estimates!											
208	The data set for variable Cobalt, dissolved (mw-1) was not processed!											
209												
210	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
211	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
212												

	A	B	C	D	E	F	G	H	I	J	K	L
213												
214												
215	**Cobalt, dissolved (mw-10)**											
216												
217	**General Statistics**											
218					Number of Valid Data	14			Number of Detected Data	0		
219					Number of Distinct Detected Data	0			Number of Non-Detect Data	14		
220									Percent Non-Detects	100.00%		
221												
222	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
223	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
224	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
225												
226	**The data set for variable Cobalt, dissolved (mw-10) was not processed!**											
227												
228												
229												
230	**Cobalt, dissolved (mw-11)**											
231												
232	**General Statistics**											
233					Number of Valid Data	9			Number of Detected Data	0		
234					Number of Distinct Detected Data	0			Number of Non-Detect Data	9		
235									Percent Non-Detects	100.00%		
236												
237	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
238	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
239	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
240												
241	**The data set for variable Cobalt, dissolved (mw-11) was not processed!**											
242												
243												
244												
245	**Cobalt, dissolved (mw-12)**											
246												
247	**General Statistics**											
248					Number of Valid Data	17			Number of Detected Data	0		
249					Number of Distinct Detected Data	0			Number of Non-Detect Data	17		
250									Percent Non-Detects	100.00%		
251												
252	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
253	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
254	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
255												
256	**The data set for variable Cobalt, dissolved (mw-12) was not processed!**											
257												
258												
259												
260	**Cobalt, dissolved (mw-13)**											
261												
262	**General Statistics**											
263					Number of Valid Data	2			Number of Detected Data	0		
264					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
265									Percent Non-Detects	100.00%		

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267	Warning: This data set only has 2 observations!											
268	Data set is too small to compute reliable and meaningful statistics and estimates!											
269	The data set for variable Cobalt, dissolved (mw-13) was not processed!											
270												
271	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
272	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
273												
274												
275												
276	Cobalt, dissolved (mw-14)											
277												
278	General Statistics											
279						Number of Valid Data	2			Number of Detected Data	1	
280						Number of Distinct Detected Data	1			Number of Non-Detect Data	1	
281										Percent Non-Detects	50.00%	
282												
283	Warning: This data set only has 2 observations!											
284	Data set is too small to compute reliable and meaningful statistics and estimates!											
285	The data set for variable Cobalt, dissolved (mw-14) was not processed!											
286												
287	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
288	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
289												
290												
291												
292	Cobalt, dissolved (mw-19)											
293												
294	General Statistics											
295						Number of Valid Data	1			Number of Detected Data	0	
296						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
297										Percent Non-Detects	100.00%	
298												
299	Warning: This data set only has 1 observations!											
300	Data set is too small to compute reliable and meaningful statistics and estimates!											
301	The data set for variable Cobalt, dissolved (mw-19) was not processed!											
302												
303	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
304	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
305												
306												
307												
308	Cobalt, dissolved (mw-20-100)											
309												
310	General Statistics											
311						Number of Valid Data	1			Number of Detected Data	0	
312						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
313										Percent Non-Detects	100.00%	
314												
315	Warning: This data set only has 1 observations!											
316	Data set is too small to compute reliable and meaningful statistics and estimates!											
317	The data set for variable Cobalt, dissolved (mw-20-100) was not processed!											
318												

	A	B	C	D	E	F	G	H	I	J	K	L
319	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
320	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
321												
322												
323												
324	Cobalt, dissolved (mw-20-130)											
325												
326	General Statistics											
327					Number of Valid Data	12			Number of Detected Data	1		
328					Number of Distinct Detected Data	1			Number of Non-Detect Data	11		
329									Percent Non-Detects	91.67%		
330												
331	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
332	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
333												
334	The data set for variable Cobalt, dissolved (mw-20-130) was not processed!											
335												
336												
337												
338	Cobalt, dissolved (mw-20-70)											
339												
340	General Statistics											
341					Number of Valid Data	13			Number of Detected Data	0		
342					Number of Distinct Detected Data	0			Number of Non-Detect Data	13		
343									Percent Non-Detects	100.00%		
344												
345	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
346	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
347	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
348												
349	The data set for variable Cobalt, dissolved (mw-20-70) was not processed!											
350												
351												
352												
353	Cobalt, dissolved (mw-21)											
354												
355	General Statistics											
356					Number of Valid Data	4			Number of Detected Data	0		
357					Number of Distinct Detected Data	0			Number of Non-Detect Data	4		
358									Percent Non-Detects	100.00%		
359												
360	Warning: This data set only has 4 observations!											
361	Data set is too small to compute reliable and meaningful statistics and estimates!											
362	The data set for variable Cobalt, dissolved (mw-21) was not processed!											
363												
364	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
365	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
366												
367												
368												
369	Cobalt, dissolved (mw-22)											
370												
371	General Statistics											

372				Number of Valid Data	3					Number of Detected Data	1	
373				Number of Distinct Detected Data	1					Number of Non-Detect Data	2	
374										Percent Non-Detects	66.67%	
375												
376												
377												
378												
379												
380												
381												
382												
383												
384												
385	Cobalt, dissolved (mw-23)											
386												
387												
388				Number of Valid Data	4					Number of Detected Data	0	
389				Number of Distinct Detected Data	0					Number of Non-Detect Data	4	
390										Percent Non-Detects	100.00%	
391												
392												
393												
394												
395												
396												
397												
398												
399												
400												
401	Cobalt, dissolved (mw-24a)											
402												
403												
404				Number of Valid Data	3					Number of Detected Data	0	
405				Number of Distinct Detected Data	0					Number of Non-Detect Data	3	
406										Percent Non-Detects	100.00%	
407												
408												
409												
410												
411												
412												
413												
414												
415												
416												
417	Cobalt, dissolved (mw-24b)											
418												
419												
420				Number of Valid Data	1					Number of Detected Data	0	
421				Number of Distinct Detected Data	0					Number of Non-Detect Data	1	
422										Percent Non-Detects	100.00%	
423												
424												

Warning: This data set only has 3 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Cobalt, dissolved (mw-22) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

General Statistics

Warning: This data set only has 4 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Cobalt, dissolved (mw-23) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

General Statistics

Warning: This data set only has 3 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Cobalt, dissolved (mw-24a) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

General Statistics

Warning: This data set only has 1 observations!

	A	B	C	D	E	F	G	H	I	J	K	L
425	Data set is too small to compute reliable and meaningful statistics and estimates!											
426	The data set for variable Cobalt, dissolved (mw-24b) was not processed!											
427												
428	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
429	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
430												
431												
432												
433	Cobalt, dissolved (mw-25)											
434												
435	General Statistics											
436						Number of Valid Data	10			Number of Detected Data	0	
437						Number of Distinct Detected Data	0			Number of Non-Detect Data	10	
438										Percent Non-Detects	100.00%	
439												
440	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
441	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
442	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
443												
444	The data set for variable Cobalt, dissolved (mw-25) was not processed!											
445												
446												
447												
448	Cobalt, dissolved (mw-26)											
449												
450	General Statistics											
451						Number of Valid Data	3			Number of Detected Data	0	
452						Number of Distinct Detected Data	0			Number of Non-Detect Data	3	
453										Percent Non-Detects	100.00%	
454												
455	Warning: This data set only has 3 observations!											
456	Data set is too small to compute reliable and meaningful statistics and estimates!											
457	The data set for variable Cobalt, dissolved (mw-26) was not processed!											
458												
459	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
460	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
461												
462												
463												
464	Cobalt, dissolved (mw-3)											
465												
466	General Statistics											
467						Number of Valid Data	2			Number of Detected Data	0	
468						Number of Distinct Detected Data	0			Number of Non-Detect Data	2	
469										Percent Non-Detects	100.00%	
470												
471	Warning: This data set only has 2 observations!											
472	Data set is too small to compute reliable and meaningful statistics and estimates!											
473	The data set for variable Cobalt, dissolved (mw-3) was not processed!											
474												
475	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
476	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
477												

478												
479												
480	**Cobalt, dissolved (mw-30-30)**											
481												
482	**General Statistics**											
483						Number of Valid Data	1			Number of Detected Data		0
484						Number of Distinct Detected Data	0			Number of Non-Detect Data		1
485										Percent Non-Detects		100.00%
486												
487	**Warning: This data set only has 1 observations!**											
488	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
489	**The data set for variable Cobalt, dissolved (mw-30-30) was not processed!**											
490												
491	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
492	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
493												
494												
495												
496	**Cobalt, dissolved (mw-31-60)**											
497												
498	**General Statistics**											
499						Number of Valid Data	2			Number of Detected Data		0
500						Number of Distinct Detected Data	0			Number of Non-Detect Data		2
501										Percent Non-Detects		100.00%
502												
503	**Warning: This data set only has 2 observations!**											
504	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
505	**The data set for variable Cobalt, dissolved (mw-31-60) was not processed!**											
506												
507	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
508	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
509												
510												
511												
512	**Cobalt, dissolved (mw-32-35)**											
513												
514	**General Statistics**											
515						Number of Valid Data	3			Number of Detected Data		0
516						Number of Distinct Detected Data	0			Number of Non-Detect Data		3
517										Percent Non-Detects		100.00%
518												
519	**Warning: This data set only has 3 observations!**											
520	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
521	**The data set for variable Cobalt, dissolved (mw-32-35) was not processed!**											
522												
523	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
524	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
525												
526												
527												
528	**Cobalt, dissolved (mw-33-210)**											
529												
530	**General Statistics**											

531	Number of Valid Observations				1	Number of Distinct Observations					1	
532												
533												
534	Warning: This data set only has 1 observations!											
535	Data set is too small to compute reliable and meaningful statistics and estimates!											
536	The data set for variable Cobalt, dissolved (mw-33-210) was not processed!											
537												
538	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
539	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
540												
541												
542												
543	Cobalt, dissolved (mw-33-90)											
544												
545	General Statistics											
546	Number of Valid Data				1	Number of Detected Data					0	
547	Number of Distinct Detected Data				0	Number of Non-Detect Data					1	
548						Percent Non-Detects					100.00%	
549												
550	Warning: This data set only has 1 observations!											
551	Data set is too small to compute reliable and meaningful statistics and estimates!											
552	The data set for variable Cobalt, dissolved (mw-33-90) was not processed!											
553												
554	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
555	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
556												
557												
558												
559	Cobalt, dissolved (mw-34-100)											
560												
561	General Statistics											
562	Number of Valid Data				1	Number of Detected Data					0	
563	Number of Distinct Detected Data				0	Number of Non-Detect Data					1	
564						Percent Non-Detects					100.00%	
565												
566	Warning: This data set only has 1 observations!											
567	Data set is too small to compute reliable and meaningful statistics and estimates!											
568	The data set for variable Cobalt, dissolved (mw-34-100) was not processed!											
569												
570	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
571	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
572												
573												
574												
575	Cobalt, dissolved (mw-34-55)											
576												
577	General Statistics											
578	Number of Valid Data				9	Number of Detected Data					0	
579	Number of Distinct Detected Data				0	Number of Non-Detect Data					9	
580						Percent Non-Detects					100.00%	
581												
582	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
583	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											

584	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
585												
586	The data set for variable Cobalt, dissolved (mw-34-55) was not processed!											
587												
588												
589												
590	Cobalt, dissolved (mw-34-80)											
591												
592	General Statistics											
593						Number of Valid Data	13			Number of Detected Data	5	
594						Number of Distinct Detected Data	5			Number of Non-Detect Data	8	
595										Percent Non-Detects	61.54%	
596												
597	Raw Statistics							Log-transformed Statistics				
598						Minimum Detected	0.00108			Minimum Detected	-6.831	
599						Maximum Detected	0.00139			Maximum Detected	-6.578	
600						Mean of Detected	0.00125			Mean of Detected	-6.687	
601						SD of Detected	0.0001203			SD of Detected	0.0979	
602						Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908	
603						Maximum Non-Detect	0.005			Maximum Non-Detect	-5.298	
604												
605	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	13	
606	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
607	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
608												
609	Warning: There are only 5 Detected Values in this data											
610	Note: It should be noted that even though bootstrap may be performed on this data set											
611	the resulting calculations may not be reliable enough tp draw conclusions											
612												
613	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
614												
615												
616	UCL Statistics											
617	Normal Distribution Test with Detected Values Only							Lognormal Distribution Test with Detected Values Only				
618						Shapiro Wilk Test Statistic	0.954			Shapiro Wilk Test Statistic	0.946	
619						5% Shapiro Wilk Critical Value	0.762			5% Shapiro Wilk Critical Value	0.762	
620	Data appear Normal at 5% Significance Level							Data appear Lognormal at 5% Significance Level				
621												
622	Assuming Normal Distribution							Assuming Lognormal Distribution				
623						DL/2 Substitution Method				DL/2 Substitution Method		
624						Mean	0.00126			Mean	-6.782	
625						SD	0.0005486			SD	0.506	
626						95% DL/2 (t) UCL	0.00153			95% H-Stat (DL/2) UCL	0.00165	
627												
628						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
629	MLE method failed to converge properly									Mean in Log Scale	-6.786	
630										SD in Log Scale	0.131	
631										Mean in Original Scale	0.00114	
632										SD in Original Scale	0.0001475	
633										95% Percentile Bootstrap UCL	0.0012	
634										95% BCA Bootstrap UCL	0.0012	
635												
636	Gamma Distribution Test with Detected Values Only							Data Distribution Test with Detected Values Only				

637				k star (bias corrected)	53.08	**Data appear Normal at 5% Significance Level**						
638				Theta Star	2.359E-05							
639				nu star	530.8							
640												
641				A-D Test Statistic	0.275	**Nonparametric Statistics**						
642				5% A-D Critical Value	0.678					Kaplan-Meier (KM) Method		
643				K-S Test Statistic	0.678					Mean	0.00119	
644				5% K-S Critical Value	0.357					SD	0.000119	
645	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	4.705E-05	
646										95% KM (t) UCL	0.00127	
647	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00126	
648				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00128	
649				Minimum	0.00108					95% KM (bootstrap t) UCL	0.00127	
650				Maximum	0.00141					95% KM (BCA) UCL	0.00134	
651				Mean	0.00127					95% KM (Percentile Bootstrap) UCL	0.0013	
652				Median	0.00128					95% KM (Chebyshev) UCL	0.00139	
653				SD	0.0001098					97.5% KM (Chebyshev) UCL	0.00148	
654				k star	108.7					99% KM (Chebyshev) UCL	0.00166	
655				Theta star	0.0000117							
656				Nu star	2825	**Potential UCLs to Use**						
657				AppChi2	2702					95% KM (t) UCL	0.00127	
658				95% Gamma Approximate UCL	0.00133					95% KM (Percentile Bootstrap) UCL	0.0013	
659				95% Adjusted Gamma UCL	0.00134							
660	**Note: DL/2 is not a recommended method.**											
661												
662												
663	**Cobalt, dissolved (mw-35-135)**											
664												
665	**General Statistics**											
666				Number of Valid Data	1	Number of Detected Data	0					
667				Number of Distinct Detected Data	0	Number of Non-Detect Data	1					
668						Percent Non-Detects	100.00%					
669												
670	**Warning: This data set only has 1 observations!**											
671	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
672	**The data set for variable Cobalt, dissolved (mw-35-135) was not processed!**											
673												
674	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
675	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
676												
677												
678												
679	**Cobalt, dissolved (mw-35-60)**											
680												
681	**General Statistics**											
682				Number of Valid Data	1	Number of Detected Data	0					
683				Number of Distinct Detected Data	0	Number of Non-Detect Data	1					
684						Percent Non-Detects	100.00%					
685												
686	**Warning: This data set only has 1 observations!**											
687	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
688	**The data set for variable Cobalt, dissolved (mw-35-60) was not processed!**											
689												

690	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
691	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
692												
693												
694												
695	**Cobalt, dissolved (mw-37d)**											
696												
697	**General Statistics**											
698						Number of Valid Data	13			Number of Detected Data	2	
699						Number of Distinct Detected Data	2			Number of Non-Detect Data	11	
700										Percent Non-Detects	84.62%	
701												
702	**Raw Statistics**							**Log-transformed Statistics**				
703						Minimum Detected	0.00106			Minimum Detected	-6.849	
704						Maximum Detected	0.00117			Maximum Detected	-6.751	
705						Mean of Detected	0.00112			Mean of Detected	-6.8	
706						SD of Detected	7.778E-05			SD of Detected	0.0698	
707						Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908	
708						Maximum Non-Detect	0.005			Maximum Non-Detect	-5.298	
709												
710	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	13	
711	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
712	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
713												
714	**Warning: Data set has only 2 Distinct Detected Values.**											
715	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
716	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
717												
718	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
719												
720	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
721	**Those methods will return a 'N/A' value on your output display!**											
722												
723	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
724	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
725												
726												
727	**UCL Statistics**											
728	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
729						Shapiro Wilk Test Statistic	1			Shapiro Wilk Test Statistic	1	
730						5% Shapiro Wilk Critical Value	N/A			5% Shapiro Wilk Critical Value	N/A	
731	**Data not Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**				
732												
733	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
734						DL/2 Substitution Method				DL/2 Substitution Method		
735						Mean	0.00106			Mean	-7.011	
736						SD	0.0006347			SD	0.6	
737						95% DL/2 (t) UCL	0.00138			95% H-Stat (DL/2) UCL	0.0021	
738												
739						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
740	**MLE method failed to converge properly**									Mean in Log Scale	N/A	
741										SD in Log Scale	N/A	
742										Mean in Original Scale	N/A	

743											SD in Original Scale	N/A
744											95% Percentile Bootstrap UCL	N/A
745											95% BCA Bootstrap UCL	N/A
746												
747	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
748					k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**	
749					Theta Star	N/A						
750					nu star	N/A						
751												
752					A-D Test Statistic	0.359					**Nonparametric Statistics**	
753					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
754					K-S Test Statistic	N/A					Mean	0.00107
755					5% K-S Critical Value	N/A					SD	3.638E-05
756	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	1.819E-05
757											95% KM (t) UCL	0.00111
758	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0011
759					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00115
760					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
761					Maximum	N/A					95% KM (BCA) UCL	N/A
762					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00117
763					Median	N/A					95% KM (Chebyshev) UCL	0.00115
764					SD	N/A					97.5% KM (Chebyshev) UCL	0.00119
765					k star	N/A					99% KM (Chebyshev) UCL	0.00125
766					Theta star	N/A						
767					Nu star	N/A					**Potential UCLs to Use**	
768					AppChi2	N/A					95% KM (t) UCL	0.00111
769					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.00117
770					95% Adjusted Gamma UCL	N/A						
771	**Note: DL/2 is not a recommended method.**											
772												
773												
774	**Cobalt, dissolved (mw-37s)**											
775												
776	**General Statistics**											
777					Number of Valid Data	1					Number of Detected Data	0
778					Number of Distinct Detected Data	0					Number of Non-Detect Data	1
779											Percent Non-Detects	100.00%
780												
781	**Warning: This data set only has 1 observations!**											
782	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
783	**The data set for variable Cobalt, dissolved (mw-37s) was not processed!**											
784												
785	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
786	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
787												
788												
789												
790	**Cobalt, dissolved (mw-38s)**											
791												
792	**General Statistics**											
793					Number of Valid Data	1					Number of Detected Data	0
794					Number of Distinct Detected Data	0					Number of Non-Detect Data	1
795											Percent Non-Detects	100.00%

	A	B	C	D	E	F	G	H	I	J	K	L
796												
797	Warning: This data set only has 1 observations!											
798	Data set is too small to compute reliable and meaningful statistics and estimates!											
799	The data set for variable Cobalt, dissolved (mw-38s) was not processed!											
800												
801	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
802	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
803												
804												
805												
806	Cobalt, dissolved (mw-39-60)											
807												
808	General Statistics											
809					Number of Valid Data	1			Number of Detected Data	0		
810					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
811									Percent Non-Detects	100.00%		
812												
813	Warning: This data set only has 1 observations!											
814	Data set is too small to compute reliable and meaningful statistics and estimates!											
815	The data set for variable Cobalt, dissolved (mw-39-60) was not processed!											
816												
817	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
818	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
819												
820												
821												
822	Cobalt, dissolved (mw-4)											
823												
824	General Statistics											
825					Number of Valid Data	2			Number of Detected Data	0		
826					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
827									Percent Non-Detects	100.00%		
828												
829	Warning: This data set only has 2 observations!											
830	Data set is too small to compute reliable and meaningful statistics and estimates!											
831	The data set for variable Cobalt, dissolved (mw-4) was not processed!											
832												
833	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
834	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
835												
836												
837												
838	Cobalt, dissolved (mw-40s)											
839												
840	General Statistics											
841					Number of Valid Data	1			Number of Detected Data	0		
842					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
843									Percent Non-Detects	100.00%		
844												
845	Warning: This data set only has 1 observations!											
846	Data set is too small to compute reliable and meaningful statistics and estimates!											
847	The data set for variable Cobalt, dissolved (mw-40s) was not processed!											
848												

	A	B	C	D	E	F	G	H	I	J	K	L
849	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
850	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
851												
852												
853												
854	Cobalt, dissolved (mw-43-25)											
855												
856	General Statistics											
857					Number of Valid Data	3			Number of Detected Data	0		
858					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
859									Percent Non-Detects	100.00%		
860												
861	Warning: This data set only has 3 observations!											
862	Data set is too small to compute reliable and meaningful statistics and estimates!											
863	The data set for variable Cobalt, dissolved (mw-43-25) was not processed!											
864												
865	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
866	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
867												
868												
869												
870	Cobalt, dissolved (mw-44-115)											
871												
872	General Statistics											
873					Number of Valid Data	3			Number of Detected Data	0		
874					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
875									Percent Non-Detects	100.00%		
876												
877	Warning: This data set only has 3 observations!											
878	Data set is too small to compute reliable and meaningful statistics and estimates!											
879	The data set for variable Cobalt, dissolved (mw-44-115) was not processed!											
880												
881	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
882	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
883												
884												
885												
886	Cobalt, dissolved (mw-48)											
887												
888	General Statistics											
889					Number of Valid Data	3			Number of Detected Data	0		
890					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
891									Percent Non-Detects	100.00%		
892												
893	Warning: This data set only has 3 observations!											
894	Data set is too small to compute reliable and meaningful statistics and estimates!											
895	The data set for variable Cobalt, dissolved (mw-48) was not processed!											
896												
897	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
898	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
899												
900												
901												

	A	B	C	D	E	F	G	H	I	J	K	L
902	**Cobalt, dissolved (mw-5)**											
903												
904	**General Statistics**											
905					Number of Valid Data	2			Number of Detected Data			0
906					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
907									Percent Non-Detects			100.00%
908												
909	**Warning: This data set only has 2 observations!**											
910	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
911	**The data set for variable Cobalt, dissolved (mw-5) was not processed!**											
912												
913	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
914	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
915												
916												
917												
918	**Cobalt, dissolved (mw-50-200)**											
919												
920	**General Statistics**											
921					Number of Valid Data	3			Number of Detected Data			0
922					Number of Distinct Detected Data	0			Number of Non-Detect Data			3
923									Percent Non-Detects			100.00%
924												
925	**Warning: This data set only has 3 observations!**											
926	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
927	**The data set for variable Cobalt, dissolved (mw-50-200) was not processed!**											
928												
929	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
930	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
931												
932												
933												
934	**Cobalt, dissolved (mw-51)**											
935												
936	**General Statistics**											
937					Number of Valid Data	3			Number of Detected Data			0
938					Number of Distinct Detected Data	0			Number of Non-Detect Data			3
939									Percent Non-Detects			100.00%
940												
941	**Warning: This data set only has 3 observations!**											
942	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
943	**The data set for variable Cobalt, dissolved (mw-51) was not processed!**											
944												
945	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
946	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
947												
948												
949												
950	**Cobalt, dissolved (mw-6)**											
951												
952	**General Statistics**											
953					Number of Valid Data	2			Number of Detected Data			0
954					Number of Distinct Detected Data	0			Number of Non-Detect Data			2

955											Percent Non-Detects	100.00%
956												
957	Warning: This data set only has 2 observations!											
958	Data set is too small to compute reliable and meaningful statistics and estimates!											
959	The data set for variable Cobalt, dissolved (mw-6) was not processed!											
960												
961	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
962	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
963												
964												
965												
966	Cobalt, dissolved (mw-7)											
967												
968	General Statistics											
969						Number of Valid Data	2				Number of Detected Data	0
970						Number of Distinct Detected Data	0				Number of Non-Detect Data	2
971											Percent Non-Detects	100.00%
972												
973	Warning: This data set only has 2 observations!											
974	Data set is too small to compute reliable and meaningful statistics and estimates!											
975	The data set for variable Cobalt, dissolved (mw-7) was not processed!											
976												
977	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
978	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
979												
980												
981												
982	Cobalt, dissolved (mw-8)											
983												
984	General Statistics											
985						Number of Valid Data	2				Number of Detected Data	0
986						Number of Distinct Detected Data	0				Number of Non-Detect Data	2
987											Percent Non-Detects	100.00%
988												
989	Warning: This data set only has 2 observations!											
990	Data set is too small to compute reliable and meaningful statistics and estimates!											
991	The data set for variable Cobalt, dissolved (mw-8) was not processed!											
992												
993	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
994	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
995												
996												
997												
998	Cobalt, dissolved (mw-9)											
999												
1000	General Statistics											
1001						Number of Valid Data	1				Number of Detected Data	0
1002						Number of Distinct Detected Data	0				Number of Non-Detect Data	1
1003											Percent Non-Detects	100.00%
1004												
1005	Warning: This data set only has 1 observations!											
1006	Data set is too small to compute reliable and meaningful statistics and estimates!											
1007	The data set for variable Cobalt, dissolved (mw-9) was not processed!											

	A	B	C	D	E	F	G	H	I	J	K	L
1008												
1009	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1010	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1011												
1012												
1013												
1014	Cobalt, dissolved (ow-1d)											
1015												
1016	General Statistics											
1017					Number of Valid Data	15			Number of Detected Data	0		
1018					Number of Distinct Detected Data	0			Number of Non-Detect Data	15		
1019									Percent Non-Detects	100.00%		
1020												
1021	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1022	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1023	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1024												
1025	The data set for variable Cobalt, dissolved (ow-1d) was not processed!											
1026												
1027												
1028												
1029	Cobalt, dissolved (ow-1m)											
1030												
1031	General Statistics											
1032					Number of Valid Data	14			Number of Detected Data	0		
1033					Number of Distinct Detected Data	0			Number of Non-Detect Data	14		
1034									Percent Non-Detects	100.00%		
1035												
1036	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1037	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1038	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1039												
1040	The data set for variable Cobalt, dissolved (ow-1m) was not processed!											
1041												
1042												
1043												
1044	Cobalt, dissolved (ow-1s)											
1045												
1046	General Statistics											
1047					Number of Valid Data	13			Number of Detected Data	0		
1048					Number of Distinct Detected Data	0			Number of Non-Detect Data	13		
1049									Percent Non-Detects	100.00%		
1050												
1051	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1052	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1053	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1054												
1055	The data set for variable Cobalt, dissolved (ow-1s) was not processed!											
1056												
1057												
1058												
1059	Cobalt, dissolved (ow-2d)											
1060												

	A	B	C	D	E	F	G	H	I	J	K	L
1061	General Statistics											
1062					Number of Valid Data	14				Number of Detected Data		0
1063					Number of Distinct Detected Data	0				Number of Non-Detect Data		14
1064										Percent Non-Detects		100.00%
1065												
1066	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1067	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1068	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1069												
1070	The data set for variable Cobalt, dissolved (ow-2d) was not processed!											
1071												
1072												
1073												
1074	Cobalt, dissolved (ow-2m)											
1075												
1076	General Statistics											
1077					Number of Valid Data	13				Number of Detected Data		0
1078					Number of Distinct Detected Data	0				Number of Non-Detect Data		13
1079										Percent Non-Detects		100.00%
1080												
1081	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1082	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1083	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1084												
1085	The data set for variable Cobalt, dissolved (ow-2m) was not processed!											
1086												
1087												
1088												
1089	Cobalt, dissolved (ow-2s)											
1090												
1091	General Statistics											
1092					Number of Valid Data	13				Number of Detected Data		0
1093					Number of Distinct Detected Data	0				Number of Non-Detect Data		13
1094										Percent Non-Detects		100.00%
1095												
1096	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1097	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1098	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1099												
1100	The data set for variable Cobalt, dissolved (ow-2s) was not processed!											
1101												
1102												
1103												
1104	Cobalt, dissolved (ow-3d)											
1105												
1106	General Statistics											
1107					Number of Valid Data	1				Number of Detected Data		0
1108					Number of Distinct Detected Data	0				Number of Non-Detect Data		1
1109										Percent Non-Detects		100.00%
1110												
1111	Warning: This data set only has 1 observations!											
1112	Data set is too small to compute reliable and meaningful statistics and estimates!											
1113	The data set for variable Cobalt, dissolved (ow-3d) was not processed!											

	A	B	C	D	E	F	G	H	I	J	K	L
1114												
1115	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1116	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1117												
1118												
1119												
1120	Cobalt, dissolved (ow-3m)											
1121												
1122	General Statistics											
1123						Number of Valid Data	2			Number of Detected Data	0	
1124						Number of Distinct Detected Data	0			Number of Non-Detect Data	2	
1125										Percent Non-Detects	100.00%	
1126												
1127	Warning: This data set only has 2 observations!											
1128	Data set is too small to compute reliable and meaningful statistics and estimates!											
1129	The data set for variable Cobalt, dissolved (ow-3m) was not processed!											
1130												
1131	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1132	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1133												
1134												
1135												
1136	Cobalt, dissolved (ow-3s)											
1137												
1138	General Statistics											
1139						Number of Valid Data	1			Number of Detected Data	0	
1140						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
1141										Percent Non-Detects	100.00%	
1142												
1143	Warning: This data set only has 1 observations!											
1144	Data set is too small to compute reliable and meaningful statistics and estimates!											
1145	The data set for variable Cobalt, dissolved (ow-3s) was not processed!											
1146												
1147	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1148	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1149												
1150												
1151												
1152	Cobalt, dissolved (ow-5d)											
1153												
1154	General Statistics											
1155						Number of Valid Data	14			Number of Detected Data	0	
1156						Number of Distinct Detected Data	0			Number of Non-Detect Data	14	
1157										Percent Non-Detects	100.00%	
1158												
1159	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1160	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1161	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1162												
1163	The data set for variable Cobalt, dissolved (ow-5d) was not processed!											
1164												
1165												
1166												

	A	B	C	D	E	F	G	H	I	J	K	L
1167	**Cobalt, dissolved (ow-5m)**											
1168												
1169	**General Statistics**											
1170					Number of Valid Data	14			Number of Detected Data			1
1171					Number of Distinct Detected Data	1			Number of Non-Detect Data			13
1172									Percent Non-Detects			92.86%
1173												
1174	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
1175	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
1176												
1177	**The data set for variable Cobalt, dissolved (ow-5m) was not processed!**											
1178												
1179												
1180												
1181	**Cobalt, dissolved (ow-5s)**											
1182												
1183	**General Statistics**											
1184					Number of Valid Data	14			Number of Detected Data			1
1185					Number of Distinct Detected Data	1			Number of Non-Detect Data			13
1186									Percent Non-Detects			92.86%
1187												
1188	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
1189	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
1190												
1191	**The data set for variable Cobalt, dissolved (ow-5s) was not processed!**											
1192												
1193												
1194												
1195	**Cobalt, dissolved (park moabi-4)**											
1196												
1197	**General Statistics**											
1198					Number of Valid Data	1			Number of Detected Data			0
1199					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
1200									Percent Non-Detects			100.00%
1201												
1202	**Warning: This data set only has 1 observations!**											
1203	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1204	**The data set for variable Cobalt, dissolved (park moabi-4) was not processed!**											
1205												
1206	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1207	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1208												
1209												
1210												
1211	**Cobalt, dissolved (tw-1)**											
1212												
1213	**General Statistics**											
1214					Number of Valid Data	4			Number of Detected Data			0
1215					Number of Distinct Detected Data	0			Number of Non-Detect Data			4
1216									Percent Non-Detects			100.00%
1217												
1218	**Warning: This data set only has 4 observations!**											
1219	**Data set is too small to compute reliable and meaningful statistics and estimates!**											

	A	B	C	D	E	F	G	H	I	J	K	L
1220	The data set for variable Cobalt, dissolved (tw-1) was not processed!											
1221												
1222	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1223	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1224												
1225												
1226												
1227	Cobalt, dissolved (tw-2d)											
1228												
1229	General Statistics											
1230					Number of Valid Data	3			Number of Detected Data	0		
1231					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
1232									Percent Non-Detects	100.00%		
1233												
1234	Warning: This data set only has 3 observations!											
1235	Data set is too small to compute reliable and meaningful statistics and estimates!											
1236	The data set for variable Cobalt, dissolved (tw-2d) was not processed!											
1237												
1238	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1239	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1240												
1241												
1242												
1243	Cobalt, dissolved (tw-2s)											
1244												
1245	General Statistics											
1246					Number of Valid Data	3			Number of Detected Data	0		
1247					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
1248									Percent Non-Detects	100.00%		
1249												
1250	Warning: This data set only has 3 observations!											
1251	Data set is too small to compute reliable and meaningful statistics and estimates!											
1252	The data set for variable Cobalt, dissolved (tw-2s) was not processed!											
1253												
1254	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1255	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1256												
1257												

1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	Copper, dissolved (1)											
10												
11					General Statistics							
12					Number of Valid Data	149			Number of Detected Data	104		
13					Number of Distinct Detected Data	96			Number of Non-Detect Data	45		
14									Percent Non-Detects	30.20%		
15												
16					Raw Statistics				Log-transformed Statistics			
17					Minimum Detected	0.00101			Minimum Detected	-6.898		
18					Maximum Detected	0.0205			Maximum Detected	-3.887		
19					Mean of Detected	0.00417			Mean of Detected	-5.756		
20					SD of Detected	0.00404			SD of Detected	0.689		
21					Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908		
22					Maximum Non-Detect	0.00325			Maximum Non-Detect	-5.729		
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	100		
25	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	49		
26	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	67.11%		
27												
28					UCL Statistics							
29					Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only			
30					Lilliefors Test Statistic	0.254			Lilliefors Test Statistic	0.0895		
31					5% Lilliefors Critical Value	0.0869			5% Lilliefors Critical Value	0.0869		
32					Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
33												
34					Assuming Normal Distribution				Assuming Lognormal Distribution			
35					DL/2 Substitution Method				DL/2 Substitution Method			
36					Mean	0.00308			Mean	-6.295		
37					SD	0.00376			SD	1.01		
38					95% DL/2 (t) UCL	0.00359			95% H-Stat (DL/2) UCL	0.00306		
39												
40					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
41					MLE yields a negative mean				Mean in Log Scale	-6.233		
42									SD in Log Scale	0.962		
43									Mean in Original Scale	0.00313		
44									SD in Original Scale	0.00373		
45									95% Percentile Bootstrap UCL	0.00365		
46									95% BCA Bootstrap UCL	0.00372		
47												
48					Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only			
49					k star (bias corrected)	1.914			Data do not follow a Discernable Distribution (0.05)			
50					Theta Star	0.00218						
51					nu star	398						
52												
53					A-D Test Statistic	3.43			Nonparametric Statistics			

54				5% A-D Critical Value	0.765					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.765					Mean	0.00322	
56				5% K-S Critical Value	0.0896					SD	0.00366	
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0003011	
58										95% KM (t) UCL	0.00372	
59				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00372	
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00372	
61				Minimum	1E-09					95% KM (bootstrap t) UCL	0.00384	
62				Maximum	0.0205					95% KM (BCA) UCL	0.00379	
63				Mean	0.00348					95% KM (Percentile Bootstrap) UCL	0.00374	
64				Median	0.00278					95% KM (Chebyshev) UCL	0.00453	
65				SD	0.00361					97.5% KM (Chebyshev) UCL	0.0051	
66				k star	0.594					99% KM (Chebyshev) UCL	0.00622	
67				Theta star	0.00586							
68				Nu star	176.9					**Potential UCLs to Use**		
69				AppChi2	147.1					95% KM (BCA) UCL	0.00379	
70				95% Gamma Approximate UCL	0.00418							
71				95% Adjusted Gamma UCL	0.00419							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Copper, dissolved (cw-1d)**											
76												
77					**General Statistics**							
78				Number of Valid Data	8					Number of Detected Data	0	
79				Number of Distinct Detected Data	0					Number of Non-Detect Data	8	
80										Percent Non-Detects	100.00%	
81												
82				**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**								
83				**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**								
84				**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**								
85												
86				**The data set for variable Copper, dissolved (cw-1d) was not processed!**								
87												
88												
89												
90	**Copper, dissolved (cw-1m)**											
91												
92					**General Statistics**							
93				Number of Valid Data	8					Number of Detected Data	2	
94				Number of Distinct Detected Data	2					Number of Non-Detect Data	6	
95										Percent Non-Detects	75.00%	
96												
97				**Raw Statistics**						**Log-transformed Statistics**		
98				Minimum Detected	0.00121					Minimum Detected	-6.717	
99				Maximum Detected	0.00303					Maximum Detected	-5.799	
100				Mean of Detected	0.00212					Mean of Detected	-6.258	
101				SD of Detected	0.00129					SD of Detected	0.649	
102				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
103				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
104												
105	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	8	
106	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	

107	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
108												
109	**Warning: Data set has only 2 Distinct Detected Values.**											
110	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
111	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
112												
113	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
114												
115	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
116	**Those methods will return a 'N/A' value on your output display!**											
117												
118	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
119	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
120												
121												
122	**UCL Statistics**											
123	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
124	Shapiro Wilk Test Statistic				1		Shapiro Wilk Test Statistic					1
125	5% Shapiro Wilk Critical Value				N/A		5% Shapiro Wilk Critical Value					N/A
126	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
127												
128	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
129	DL/2 Substitution Method						DL/2 Substitution Method					
130	Mean				0.00278		Mean					-6.086
131	SD				0.0016		SD					0.76
132	95% DL/2 (t) UCL				0.00385		95% H-Stat (DL/2) UCL					0.016
133												
134	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
135	**MLE method failed to converge properly**						Mean in Log Scale					N/A
136							SD in Log Scale					N/A
137							Mean in Original Scale					N/A
138							SD in Original Scale					N/A
139							95% Percentile Bootstrap UCL					N/A
140							95% BCA Bootstrap UCL					N/A
141												
142	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
143	k star (bias corrected)				N/A		**Data do not follow a Discernable Distribution (0.05)**					
144	Theta Star				N/A							
145	nu star				N/A							
146												
147	A-D Test Statistic				0.359		**Nonparametric Statistics**					
148	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
149	K-S Test Statistic				N/A		Mean					0.00182
150	5% K-S Critical Value				N/A		SD					0.000858
151	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0007005
152							95% KM (t) UCL					0.00314
153	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00297
154	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00342
155	Minimum				N/A		95% KM (bootstrap t) UCL					1.8E+308
156	Maximum				N/A		95% KM (BCA) UCL					0.00303
157	Mean				N/A		95% KM (Percentile Bootstrap) UCL					N/A
158	Median				N/A		95% KM (Chebyshev) UCL					0.00487
159	SD				N/A		97.5% KM (Chebyshev) UCL					0.00619

160					k star	N/A					99% KM (Chebyshev) UCL	0.00879
161					Theta star	N/A						
162					Nu star	N/A					**Potential UCLs to Use**	
163					AppChi2	N/A					95% KM (t) UCL	0.00314
164					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A
165					95% Adjusted Gamma UCL	N/A						
166	**Warning: Recommended UCL exceeds the maximum observation**											
167	**Note: DL/2 is not a recommended method.**											
168												
169												
170	**Copper, dissolved (cw-2d)**											
171												
172	**General Statistics**											
173					Number of Valid Data	8					Number of Detected Data	2
174					Number of Distinct Detected Data	2					Number of Non-Detect Data	6
175											Percent Non-Detects	75.00%
176												
177	**Raw Statistics**						**Log-transformed Statistics**					
178					Minimum Detected	0.00184					Minimum Detected	-6.298
179					Maximum Detected	0.00347					Maximum Detected	-5.664
180					Mean of Detected	0.00266					Mean of Detected	-5.981
181					SD of Detected	0.00115					SD of Detected	0.449
182					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
183					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
184												
185	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
186	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
187	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
188												
189	**Warning: Data set has only 2 Distinct Detected Values.**											
190	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
191	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
192												
193	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
194												
195	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
196	**Those methods will return a 'N/A' value on your output display!**											
197												
198	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
199	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
200												
201												
202	**UCL Statistics**											
203	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
204					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
205					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
206	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
207												
208	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
209					DL/2 Substitution Method						DL/2 Substitution Method	
210					Mean	0.00348					Mean	-5.729
211					SD	0.00134					SD	0.395
212					95% DL/2 (t) UCL	0.00437					95% H-Stat (DL/2) UCL	0.0121

213												
214					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
215					**MLE method failed to converge properly**						Mean in Log Scale	N/A
216											SD in Log Scale	N/A
217											Mean in Original Scale	N/A
218											SD in Original Scale	N/A
219											95% Percentile Bootstrap UCL	N/A
220											95% BCA Bootstrap UCL	N/A
221												
222					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
223					k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**	
224					Theta Star	N/A						
225					nu star	N/A						
226												
227					A-D Test Statistic	0.359					**Nonparametric Statistics**	
228					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
229					K-S Test Statistic	N/A					Mean	0.00266
230					5% K-S Critical Value	N/A					SD	0.000815
231					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.000815
232											95% KM (t) UCL	0.0042
233					**Assuming Gamma Distribution**						95% KM (z) UCL	0.004
234					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0047
235					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
236					Maximum	N/A					95% KM (BCA) UCL	0.00347
237					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00347
238					Median	N/A					95% KM (Chebyshev) UCL	0.00621
239					SD	N/A					97.5% KM (Chebyshev) UCL	0.00774
240					k star	N/A					99% KM (Chebyshev) UCL	0.0108
241					Theta star	N/A						
242					Nu star	N/A					**Potential UCLs to Use**	
243					AppChi2	N/A					95% KM (t) UCL	0.0042
244					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.00347
245					95% Adjusted Gamma UCL	N/A						
246					**Warning: Recommended UCL exceeds the maximum observation**							
247	**Note: DL/2 is not a recommended method.**											
248												
249												
250	**Copper, dissolved (cw-2m)**											
251												
252					**General Statistics**							
253					Number of Valid Data	8					Number of Detected Data	1
254					Number of Distinct Detected Data	1					Number of Non-Detect Data	7
255											Percent Non-Detects	87.50%
256												
257					**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**							
258	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
259												
260					**The data set for variable Copper, dissolved (cw-2m) was not processed!**							
261												
262												
263												
264	**Copper, dissolved (cw-3d)**											
265												

266	**General Statistics**											
267					Number of Valid Data	8			Number of Detected Data	0		
268					Number of Distinct Detected Data	0			Number of Non-Detect Data	8		
269									Percent Non-Detects	100.00%		
270												
271	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
272	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
273	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
274												
275	**The data set for variable Copper, dissolved (cw-3d) was not processed!**											
276												
277												
278												
279	**Copper, dissolved (cw-3m)**											
280												
281	**General Statistics**											
282					Number of Valid Data	8			Number of Detected Data	1		
283					Number of Distinct Detected Data	1			Number of Non-Detect Data	7		
284									Percent Non-Detects	87.50%		
285												
286	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
287	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
288												
289	**The data set for variable Copper, dissolved (cw-3m) was not processed!**											
290												
291												
292												
293	**Copper, dissolved (cw-4d)**											
294												
295	**General Statistics**											
296					Number of Valid Data	8			Number of Detected Data	1		
297					Number of Distinct Detected Data	1			Number of Non-Detect Data	7		
298									Percent Non-Detects	87.50%		
299												
300	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
301	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
302												
303	**The data set for variable Copper, dissolved (cw-4d) was not processed!**											
304												
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385												
386	**Copper, dissolved (mw-1)**											
387												
388						**General Statistics**							
389						Number of Valid Data	5				Number of Detected Data	3
390						Number of Distinct Detected Data	3				Number of Non-Detect Data	2
391											Percent Non-Detects	40.00%
392												
393						**Raw Statistics**					**Log-transformed Statistics**	
394						Minimum Detected	0.00155				Minimum Detected	-6.47
395						Maximum Detected	0.0079				Maximum Detected	-4.841
396						Mean of Detected	0.00406				Mean of Detected	-5.739
397						SD of Detected	0.00338				SD of Detected	0.827
398						Minimum Non-Detect	0.01				Minimum Non-Detect	-4.605
399						Maximum Non-Detect	0.01				Maximum Non-Detect	-4.605
400												
401												
402						**Warning: There are only 3 Distinct Detected Values in this data set**							
403						**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**						
404						**Those methods will return a 'N/A' value on your output display!**						
405												
406						**It is necessary to have 4 or more Distinct Values for bootstrap methods.**						
407						**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**						
408												
409												
410						**UCL Statistics**							
411						**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**	
412						Shapiro Wilk Test Statistic	0.883				Shapiro Wilk Test Statistic	0.969
413						5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value	0.767
414						**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**	
415												
416						**Assuming Normal Distribution**					**Assuming Lognormal Distribution**	
417						DL/2 Substitution Method					DL/2 Substitution Method	
418						Mean	0.00443				Mean	-5.563
419						SD	0.00244				SD	0.633
420						95% DL/2 (t) UCL	0.00676				95% H-Stat (DL/2) UCL	0.061
421												
422						Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method	
423						**MLE method failed to converge properly**					Mean in Log Scale	-5.739
424											SD in Log Scale	0.691

425											Mean in Original Scale	0.0039
426											SD in Original Scale	0.0027
427											95% Percentile Bootstrap UCL	0.00571
428											95% BCA Bootstrap UCL	0.00587
429												
430	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
431					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
432					Theta Star	N/A						
433					nu star	N/A						
434												
435					A-D Test Statistic	0.325	**Nonparametric Statistics**					
436					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
437					K-S Test Statistic	N/A					Mean	0.00406
438					5% K-S Critical Value	N/A					SD	0.00276
439	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00195
440											95% KM (t) UCL	0.00822
441	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00727
442					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00861
443					Minimum	N/A					95% KM (bootstrap t) UCL	0.0188
444					Maximum	N/A					95% KM (BCA) UCL	0.0079
445					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0079
446					Median	N/A					95% KM (Chebyshev) UCL	0.0126
447					SD	N/A					97.5% KM (Chebyshev) UCL	0.0162
448					k star	N/A					99% KM (Chebyshev) UCL	0.0235
449					Theta star	N/A						
450					Nu star	N/A	**Potential UCLs to Use**					
451					AppChi2	N/A					95% KM (t) UCL	0.00822
452					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0079
453					95% Adjusted Gamma UCL	N/A						
454	**Warning: Recommended UCL exceeds the maximum observation**											
455	**Note: DL/2 is not a recommended method.**											
456												
457												
458	**Copper, dissolved (mw-10)**											
459												
460	**General Statistics**											
461					Number of Valid Data	39					Number of Detected Data	16
462					Number of Distinct Detected Data	15					Number of Non-Detect Data	23
463											Percent Non-Detects	58.97%
464												
465	**Raw Statistics**						**Log-transformed Statistics**					
466					Minimum Detected	0.00118					Minimum Detected	-6.742
467					Maximum Detected	0.026					Maximum Detected	-3.65
468					Mean of Detected	0.00493					Mean of Detected	-5.668
469					SD of Detected	0.00595					SD of Detected	0.782
470					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
471					Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912
472												
473	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	38
474	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
475	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	97.44%
476												
477	**UCL Statistics**											

478	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
479					Shapiro Wilk Test Statistic	0.563					Shapiro Wilk Test Statistic	0.92
480					5% Shapiro Wilk Critical Value	0.887					5% Shapiro Wilk Critical Value	0.887
481	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
482												
483	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
484					DL/2 Substitution Method						DL/2 Substitution Method	
485					Mean	0.00479					Mean	-5.62
486					SD	0.00415					SD	0.814
487					95% DL/2 (t) UCL	0.00591					95% H-Stat (DL/2) UCL	0.00794
488												
489					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
490	**MLE method failed to converge properly**										Mean in Log Scale	-5.998
491											SD in Log Scale	0.784
492											Mean in Original Scale	0.00349
493											SD in Original Scale	0.00416
494											95% Percentile Bootstrap UCL	0.00464
495											95% BCA Bootstrap UCL	0.00543
496												
497	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
498					k star (bias corrected)	1.304	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
499					Theta Star	0.00378						
500					nu star	41.72						
501												
502					A-D Test Statistic	0.948	**Nonparametric Statistics**					
503					5% A-D Critical Value	0.754					Kaplan-Meier (KM) Method	
504					K-S Test Statistic	0.754					Mean	0.00365
505					5% K-S Critical Value	0.219					SD	0.0041
506	**Data follow Appr. Gamma Distribution at 5% Significance Level**										SE of Mean	0.0007462
507											95% KM (t) UCL	0.00491
508	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00487
509					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00489
510					Minimum	0.00118					95% KM (bootstrap t) UCL	0.00583
511					Maximum	0.026					95% KM (BCA) UCL	0.00504
512					Mean	0.00498					95% KM (Percentile Bootstrap) UCL	0.00501
513					Median	0.00453					95% KM (Chebyshev) UCL	0.0069
514					SD	0.00384					97.5% KM (Chebyshev) UCL	0.00831
515					k star	3.04					99% KM (Chebyshev) UCL	0.0111
516					Theta star	0.00164						
517					Nu star	237.1	**Potential UCLs to Use**					
518					AppChi2	202.4					95% KM (t) UCL	0.00491
519					95% Gamma Approximate UCL	0.00584						
520					95% Adjusted Gamma UCL	0.00587						
521	**Note: DL/2 is not a recommended method.**											
522												
523												
524	**Copper, dissolved (mw-11)**											
525												
526	**General Statistics**											
527					Number of Valid Data	35					Number of Detected Data	12
528					Number of Distinct Detected Data	11					Number of Non-Detect Data	23
529											Percent Non-Detects	65.71%
530												

	A	B	C	D	E	F	G	H	I	J	K	L
531	**Raw Statistics**						**Log-transformed Statistics**					
532					Minimum Detected	0.00122					Minimum Detected	-6.709
533					Maximum Detected	0.019					Maximum Detected	-3.963
534					Mean of Detected	0.00543					Mean of Detected	-5.486
535					SD of Detected	0.00494					SD of Detected	0.731
536					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
537					Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
538												
539	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	35
540	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
541	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
542												
543	**UCL Statistics**											
544	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
545					Shapiro Wilk Test Statistic	0.716					Shapiro Wilk Test Statistic	0.954
546					5% Shapiro Wilk Critical Value	0.859					5% Shapiro Wilk Critical Value	0.859
547	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
548												
549	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
550					DL/2 Substitution Method						DL/2 Substitution Method	
551					Mean	0.0106					Mean	-5.457
552					SD	0.0332					SD	1.056
553					95% DL/2 (t) UCL	0.02					95% H-Stat (DL/2) UCL	0.0111
554												
555					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
556	**MLE method failed to converge properly**										Mean in Log Scale	-5.935
557											SD in Log Scale	0.705
558											Mean in Original Scale	0.00346
559											SD in Original Scale	0.00335
560											95% Percentile Bootstrap UCL	0.00448
561											95% BCA Bootstrap UCL	0.00488
562												
563	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
564					k star (bias corrected)	1.552	**Data appear Gamma Distributed at 5% Significance Level**					
565					Theta Star	0.0035						
566					nu star	37.26						
567												
568					A-D Test Statistic	0.61	**Nonparametric Statistics**					
569					5% A-D Critical Value	0.742					Kaplan-Meier (KM) Method	
570					K-S Test Statistic	0.742					Mean	0.00366
571					5% K-S Critical Value	0.249					SD	0.0034
572	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0006891
573											95% KM (t) UCL	0.00483
574	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0048
575					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00474
576					Minimum	0.00122					95% KM (bootstrap t) UCL	0.00532
577					Maximum	0.019					95% KM (BCA) UCL	0.00523
578					Mean	0.00551					95% KM (Percentile Bootstrap) UCL	0.00498
579					Median	0.00519					95% KM (Chebyshev) UCL	0.00667
580					SD	0.00291					97.5% KM (Chebyshev) UCL	0.00797
581					k star	4.621					99% KM (Chebyshev) UCL	0.0105
582					Theta star	0.00119						
583					Nu star	323.5	**Potential UCLs to Use**					

584					AppChi2	282.8					95% KM (t) UCL	0.00483
585					95% Gamma Approximate UCL	0.0063						
586					95% Adjusted Gamma UCL	0.00634						
587	**Note: DL/2 is not a recommended method.**											
588												
589												
590	**Copper, dissolved (mw-12)**											
591												
592	**General Statistics**											
593					Number of Valid Data	41					Number of Detected Data	14
594					Number of Distinct Detected Data	12					Number of Non-Detect Data	27
595											Percent Non-Detects	65.85%
596												
597	**Raw Statistics**						**Log-transformed Statistics**					
598					Minimum Detected	0.0013					Minimum Detected	-6.645
599					Maximum Detected	0.018					Maximum Detected	-4.017
600					Mean of Detected	0.00577					Mean of Detected	-5.351
601					SD of Detected	0.00419					SD of Detected	0.638
602					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
603					Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
604												
605	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	41
606	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
607	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
608												
609	**UCL Statistics**											
610	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
611					Shapiro Wilk Test Statistic	0.783					Shapiro Wilk Test Statistic	0.96
612					5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874
613	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
614												
615	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
616					DL/2 Substitution Method						DL/2 Substitution Method	
617					Mean	0.00942					Mean	-5.6
618					SD	0.0307					SD	1.129
619					95% DL/2 (t) UCL	0.0175					95% H-Stat (DL/2) UCL	0.00839
620												
621					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
622	**MLE method failed to converge properly**										Mean in Log Scale	-5.867
623											SD in Log Scale	0.704
624											Mean in Original Scale	0.00365
625											SD in Original Scale	0.00311
626											95% Percentile Bootstrap UCL	0.00444
627											95% BCA Bootstrap UCL	0.00476
628												
629	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
630					k star (bias corrected)	2.183	**Data appear Gamma Distributed at 5% Significance Level**					
631					Theta Star	0.00264						
632					nu star	61.13						
633												
634					A-D Test Statistic	0.473	**Nonparametric Statistics**					
635					5% A-D Critical Value	0.743					Kaplan-Meier (KM) Method	
636					K-S Test Statistic	0.743					Mean	0.00386

637				5% K-S Critical Value	0.231					SD	0.00328
638	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.0006371
639										95% KM (t) UCL	0.00493
640	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00491
641	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL	0.00485
642				Minimum	1E-09					95% KM (bootstrap t) UCL	0.005
643				Maximum	0.018					95% KM (BCA) UCL	0.00547
644				Mean	0.00596					95% KM (Percentile Bootstrap) UCL	0.00524
645				Median	0.0055					95% KM (Chebyshev) UCL	0.00664
646				SD	0.00349					97.5% KM (Chebyshev) UCL	0.00784
647				k star	1.031					99% KM (Chebyshev) UCL	0.0102
648				Theta star	0.00579						
649				Nu star	84.52					**Potential UCLs to Use**	
650				AppChi2	64.33					95% KM (t) UCL	0.00493
651				95% Gamma Approximate UCL	0.00784						
652				95% Adjusted Gamma UCL	0.00791						
653	**Note: DL/2 is not a recommended method.**										
654											
655											
656	**Copper, dissolved (mw-13)**										
657											
658					**General Statistics**						
659				Number of Valid Data	27					Number of Detected Data	11
660				Number of Distinct Detected Data	10					Number of Non-Detect Data	16
661										Percent Non-Detects	59.26%
662											
663	**Raw Statistics**									**Log-transformed Statistics**	
664				Minimum Detected	0.0016					Minimum Detected	-6.438
665				Maximum Detected	0.011					Maximum Detected	-4.51
666				Mean of Detected	0.00599					Mean of Detected	-5.272
667				SD of Detected	0.0033					SD of Detected	0.608
668				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
669				Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
670											
671	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	27
672	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0
673	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%
674											
675					**UCL Statistics**						
676	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**	
677				Shapiro Wilk Test Statistic	0.909					Shapiro Wilk Test Statistic	0.947
678				5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85
679	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**	
680											
681	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
682				DL/2 Substitution Method						DL/2 Substitution Method	
683				Mean	0.0129					Mean	-5.176
684				SD	0.0375					SD	0.945
685				95% DL/2 (t) UCL	0.0252					95% H-Stat (DL/2) UCL	0.0149
686											
687				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
688	**MLE method failed to converge properly**									Mean in Log Scale	-5.476
689										SD in Log Scale	0.539

690											Mean in Original Scale	0.0048
691											SD in Original Scale	0.0026
692											95% Percentile Bootstrap UCL	0.00558
693											95% BCA Bootstrap UCL	0.00565
694												
695	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
696					k star (bias corrected)	2.527	**Data appear Normal at 5% Significance Level**					
697					Theta Star	0.00237						
698					nu star	55.59						
699												
700					A-D Test Statistic	0.281	**Nonparametric Statistics**					
701					5% A-D Critical Value	0.733					Kaplan-Meier (KM) Method	
702					K-S Test Statistic	0.733					Mean	0.00509
703					5% K-S Critical Value	0.257					SD	0.0029
704	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.000822
705											95% KM (t) UCL	0.00649
706	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00644
707					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00649
708					Minimum	0.0016					95% KM (bootstrap t) UCL	0.00677
709					Maximum	0.011					95% KM (BCA) UCL	0.00661
710					Mean	0.00608					95% KM (Percentile Bootstrap) UCL	0.00649
711					Median	0.00596					95% KM (Chebyshev) UCL	0.00867
712					SD	0.00229					97.5% KM (Chebyshev) UCL	0.0102
713					k star	5.82					99% KM (Chebyshev) UCL	0.0133
714					Theta star	0.00105						
715					Nu star	314.3	**Potential UCLs to Use**					
716					AppChi2	274.2					95% KM (t) UCL	0.00649
717					95% Gamma Approximate UCL	0.00697					95% KM (Percentile Bootstrap) UCL	0.00649
718					95% Adjusted Gamma UCL	0.00703						
719	**Note: DL/2 is not a recommended method.**											
720												
721												
722	**Copper, dissolved (mw-14)**											
723												
724	**General Statistics**											
725					Number of Valid Data	26					Number of Detected Data	12
726					Number of Distinct Detected Data	12					Number of Non-Detect Data	14
727											Percent Non-Detects	53.85%
728												
729	**Raw Statistics**						**Log-transformed Statistics**					
730					Minimum Detected	0.00348					Minimum Detected	-5.661
731					Maximum Detected	0.0297					Maximum Detected	-3.517
732					Mean of Detected	0.00757					Mean of Detected	-5.123
733					SD of Detected	0.0074					SD of Detected	0.626
734					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
735					Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912
736												
737	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	25
738	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
739	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	96.15%
740												
741	**UCL Statistics**											
742	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					

743					Shapiro Wilk Test Statistic	0.58					Shapiro Wilk Test Statistic	0.783
744					5% Shapiro Wilk Critical Value	0.859					5% Shapiro Wilk Critical Value	0.859
745					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
746												
747					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
748					DL/2 Substitution Method						DL/2 Substitution Method	
749					Mean	0.00645					Mean	-5.242
750					SD	0.00528					SD	0.66
751					95% DL/2 (t) UCL	0.00822					95% H-Stat (DL/2) UCL	0.00949
752												
753					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
754					**MLE method failed to converge properly**						Mean in Log Scale	-5.305
755											SD in Log Scale	0.553
756											Mean in Original Scale	0.00599
757											SD in Original Scale	0.00531
758											95% Percentile Bootstrap UCL	0.00781
759											95% BCA Bootstrap UCL	0.00923
760												
761					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
762					k star (bias corrected)	1.732					**Data do not follow a Discernable Distribution (0.05)**	
763					Theta Star	0.00437						
764					nu star	41.56						
765												
766					A-D Test Statistic	1.391					**Nonparametric Statistics**	
767					5% A-D Critical Value	0.741					Kaplan-Meier (KM) Method	
768					K-S Test Statistic	0.741					Mean	0.00605
769					5% K-S Critical Value	0.248					SD	0.00515
770					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00111
771											95% KM (t) UCL	0.00794
772					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00787
773					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00789
774					Minimum	0.00348					95% KM (bootstrap t) UCL	0.0101
775					Maximum	0.0297					95% KM (BCA) UCL	0.00807
776					Mean	0.00756					95% KM (Percentile Bootstrap) UCL	0.00799
777					Median	0.00691					95% KM (Chebyshev) UCL	0.0109
778					SD	0.00494					97.5% KM (Chebyshev) UCL	0.013
779					k star	4.06					99% KM (Chebyshev) UCL	0.0171
780					Theta star	0.00186						
781					Nu star	211.1					**Potential UCLs to Use**	
782					AppChi2	178.5					95% KM (t) UCL	0.00794
783					95% Gamma Approximate UCL	0.00894					95% KM (% Bootstrap) UCL	0.00799
784					95% Adjusted Gamma UCL	0.00904						
785	**Note: DL/2 is not a recommended method.**											
786												
787												
788	**Copper, dissolved (mw-15)**											
789												
790					**General Statistics**							
791					Number of Valid Data	24					Number of Detected Data	7
792					Number of Distinct Detected Data	7					Number of Non-Detect Data	17
793											Percent Non-Detects	70.83%
794												
795					**Raw Statistics**						**Log-transformed Statistics**	

796					Minimum Detected	0.00111					Minimum Detected	-6.803
797					Maximum Detected	0.019					Maximum Detected	-3.963
798					Mean of Detected	0.00903					Mean of Detected	-4.967
799					SD of Detected	0.00582					SD of Detected	0.908
800					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
801					Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
802												
803	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	24
804	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
805	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
806												
807	**Warning: There are only 7 Detected Values in this data**											
808	**Note: It should be noted that even though bootstrap may be performed on this data set**											
809	**the resulting calculations may not be reliable enough tp draw conclusions**											
810												
811	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
812												
813												
814	**UCL Statistics**											
815	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
816	Shapiro Wilk Test Statistic					0.942	Shapiro Wilk Test Statistic					0.858
817	5% Shapiro Wilk Critical Value					0.803	5% Shapiro Wilk Critical Value					0.803
818	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
819												
820	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
821	DL/2 Substitution Method						DL/2 Substitution Method					
822	Mean					0.0146	Mean					-5.01
823	SD					0.0397	SD					0.88
824	95% DL/2 (t) UCL					0.0284	95% H-Stat (DL/2) UCL					0.0152
825												
826	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
827	**MLE method failed to converge properly**						Mean in Log Scale					-5.246
828							SD in Log Scale					0.641
829							Mean in Original Scale					0.00633
830							SD in Original Scale					0.00401
831							95% Percentile Bootstrap UCL					0.00764
832							95% BCA Bootstrap UCL					0.00798
833												
834	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
835	k star (bias corrected)					1.282	**Data appear Normal at 5% Significance Level**					
836	Theta Star					0.00705						
837	nu star					17.94						
838												
839	A-D Test Statistic					0.356	**Nonparametric Statistics**					
840	5% A-D Critical Value					0.715	Kaplan-Meier (KM) Method					
841	K-S Test Statistic					0.715	Mean					0.00699
842	5% K-S Critical Value					0.315	SD					0.00399
843	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00136
844							95% KM (t) UCL					0.00932
845	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00923
846	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00951
847	Minimum					0.00111	95% KM (bootstrap t) UCL					0.00908
848	Maximum					0.019	95% KM (BCA) UCL					0.00896

849				Mean	0.00852				95% KM (Percentile Bootstrap) UCL			0.00922
850				Median	0.00803				95% KM (Chebyshev) UCL			0.0129
851				SD	0.00321				97.5% KM (Chebyshev) UCL			0.0155
852				k star	5.259				99% KM (Chebyshev) UCL			0.0205
853				Theta star	0.00162							
854				Nu star	252.5				**Potential UCLs to Use**			
855				AppChi2	216.7				95% KM (t) UCL			0.00932
856				95% Gamma Approximate UCL	0.00993				95% KM (Percentile Bootstrap) UCL			0.00922
857				95% Adjusted Gamma UCL	0.01							
858	**Note: DL/2 is not a recommended method.**											
859												
860												
861	**Copper, dissolved (mw-19)**											
862												
863	**General Statistics**											
864				Number of Valid Data	22				Number of Detected Data			6
865				Number of Distinct Detected Data	6				Number of Non-Detect Data			16
866									Percent Non-Detects			72.73%
867												
868	**Raw Statistics**								**Log-transformed Statistics**			
869				Minimum Detected	0.0016				Minimum Detected			-6.438
870				Maximum Detected	0.0126				Maximum Detected			-4.374
871				Mean of Detected	0.00595				Mean of Detected			-5.318
872				SD of Detected	0.00387				SD of Detected			0.714
873				Minimum Non-Detect	0.001				Minimum Non-Detect			-6.908
874				Maximum Non-Detect	0.4				Maximum Non-Detect			-0.916
875												
876	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			22
877	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			0
878	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
879												
880	**Warning: There are only 6 Detected Values in this data**											
881	**Note: It should be noted that even though bootstrap may be performed on this data set**											
882	**the resulting calculations may not be reliable enough tp draw conclusions**											
883												
884	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
885												
886												
887	**UCL Statistics**											
888	**Normal Distribution Test with Detected Values Only**								**Lognormal Distribution Test with Detected Values Only**			
889				Shapiro Wilk Test Statistic	0.945				Shapiro Wilk Test Statistic			0.989
890				5% Shapiro Wilk Critical Value	0.788				5% Shapiro Wilk Critical Value			0.788
891	**Data appear Normal at 5% Significance Level**								**Data appear Lognormal at 5% Significance Level**			
892												
893	**Assuming Normal Distribution**								**Assuming Lognormal Distribution**			
894				DL/2 Substitution Method					DL/2 Substitution Method			
895				Mean	0.0142				Mean			-5.199
896				SD	0.0416				SD			1.018
897				95% DL/2 (t) UCL	0.0295				95% H-Stat (DL/2) UCL			0.0181
898												
899				Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method			
900	**MLE method failed to converge properly**								Mean in Log Scale			-5.654
901									SD in Log Scale			0.607

902											Mean in Original Scale	0.00417
903											SD in Original Scale	0.00267
904											95% Percentile Bootstrap UCL	0.00513
905											95% BCA Bootstrap UCL	0.00529
906												
907	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
908					k star (bias corrected)	1.479					**Data appear Normal at 5% Significance Level**	
909					Theta Star	0.00402						
910					nu star	17.75						
911												
912					A-D Test Statistic	0.141					**Nonparametric Statistics**	
913					5% A-D Critical Value	0.702					Kaplan-Meier (KM) Method	
914					K-S Test Statistic	0.702					Mean	0.00454
915					5% K-S Critical Value	0.335					SD	0.00285
916	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00105
917											95% KM (t) UCL	0.00634
918	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00626
919	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00641
920					Minimum	0.0002948					95% KM (bootstrap t) UCL	0.00656
921					Maximum	0.0126					95% KM (BCA) UCL	0.00677
922					Mean	0.00578					95% KM (Percentile Bootstrap) UCL	0.00654
923					Median	0.00616					95% KM (Chebyshev) UCL	0.0091
924					SD	0.00322					97.5% KM (Chebyshev) UCL	0.0111
925					k star	1.724					99% KM (Chebyshev) UCL	0.0149
926					Theta star	0.00336						
927					Nu star	75.85					**Potential UCLs to Use**	
928					AppChi2	56.79					95% KM (t) UCL	0.00634
929					95% Gamma Approximate UCL	0.00773					95% KM (Percentile Bootstrap) UCL	0.00654
930					95% Adjusted Gamma UCL	0.0079						
931	**Note: DL/2 is not a recommended method.**											
932												
933												
934	**Copper, dissolved (mw-20-100)**											
935												
936	**General Statistics**											
937					Number of Valid Data	23					Number of Detected Data	10
938					Number of Distinct Detected Data	9					Number of Non-Detect Data	13
939											Percent Non-Detects	56.52%
940												
941	**Raw Statistics**										**Log-transformed Statistics**	
942					Minimum Detected	0.002					Minimum Detected	-6.215
943					Maximum Detected	0.05					Maximum Detected	-2.996
944					Mean of Detected	0.0107					Mean of Detected	-5.04
945					SD of Detected	0.0145					SD of Detected	0.949
946					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
947					Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
948												
949	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	23
950	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
951	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
952												
953	**UCL Statistics**											
954	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	

955					Shapiro Wilk Test Statistic	0.6					Shapiro Wilk Test Statistic	0.916
956					5% Shapiro Wilk Critical Value	0.842					5% Shapiro Wilk Critical Value	0.842
957					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
958												
959					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
960					DL/2 Substitution Method						DL/2 Substitution Method	
961					Mean	0.0163					Mean	-4.986
962					SD	0.0412					SD	0.99
963					95% DL/2 (t) UCL	0.0311					95% H-Stat (DL/2) UCL	0.0173
964												
965					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
966					**MLE method failed to converge properly**						Mean in Log Scale	-5.26
967											SD in Log Scale	0.725
968											Mean in Original Scale	0.00737
969											SD in Original Scale	0.00986
970											95% Percentile Bootstrap UCL	0.0111
971											95% BCA Bootstrap UCL	0.0147
972												
973					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
974					k star (bias corrected)	0.864					**Data appear Lognormal at 5% Significance Level**	
975					Theta Star	0.0123						
976					nu star	17.28						
977												
978					A-D Test Statistic	0.805					**Nonparametric Statistics**	
979					5% A-D Critical Value	0.746					Kaplan-Meier (KM) Method	
980					K-S Test Statistic	0.746					Mean	0.00739
981					5% K-S Critical Value	0.273					SD	0.00989
982					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00228
983											95% KM (t) UCL	0.0113
984					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0111
985					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0112
986					Minimum	0.002					95% KM (bootstrap t) UCL	0.0171
987					Maximum	0.05					95% KM (BCA) UCL	0.012
988					Mean	0.0106					95% KM (Percentile Bootstrap) UCL	0.0115
989					Median	0.00944					95% KM (Chebyshev) UCL	0.0173
990					SD	0.00932					97.5% KM (Chebyshev) UCL	0.0217
991					k star	2.127					99% KM (Chebyshev) UCL	0.0301
992					Theta star	0.00498						
993					Nu star	97.85					**Potential UCLs to Use**	
994					AppChi2	76.03					95% KM (t) UCL	0.0113
995					95% Gamma Approximate UCL	0.0136					95% KM (% Bootstrap) UCL	0.0115
996					95% Adjusted Gamma UCL	0.0139						
997	**Note: DL/2 is not a recommended method.**											
998												
999												
1000	**Copper, dissolved (mw-20-130)**											
1001												
1002						**General Statistics**							
1003					Number of Valid Data	34					Number of Detected Data	10
1004					Number of Distinct Detected Data	10					Number of Non-Detect Data	24
1005											Percent Non-Detects	70.59%
1006												
1007					**Raw Statistics**						**Log-transformed Statistics**	

1008				Minimum Detected	0.00162					Minimum Detected	-6.425	
1009				Maximum Detected	0.1					Maximum Detected	-2.303	
1010				Mean of Detected	0.0156					Mean of Detected	-4.997	
1011				SD of Detected	0.0299					SD of Detected	1.168	
1012				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
1013				Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916	
1014												
1015	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	34	
1016	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1017	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1018												
1019	**UCL Statistics**											
1020	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
1021				Shapiro Wilk Test Statistic	0.489					Shapiro Wilk Test Statistic	0.903	
1022				5% Shapiro Wilk Critical Value	0.842					5% Shapiro Wilk Critical Value	0.842	
1023	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
1024												
1025	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
1026				DL/2 Substitution Method						DL/2 Substitution Method		
1027				Mean	0.0133					Mean	-5.454	
1028				SD	0.0369					SD	1.29	
1029				95% DL/2 (t) UCL	0.024					95% H-Stat (DL/2) UCL	0.0147	
1030												
1031				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1032	**MLE method failed to converge properly**									Mean in Log Scale	-6.277	
1033										SD in Log Scale	1.313	
1034										Mean in Original Scale	0.00579	
1035										SD in Original Scale	0.017	
1036										95% Percentile Bootstrap UCL	0.0114	
1037										95% BCA Bootstrap UCL	0.0146	
1038												
1039	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
1040				k star (bias corrected)	0.569					**Data Follow Appr. Gamma Distribution at 5% Significance Level**		
1041				Theta Star	0.0275							
1042				nu star	11.38							
1043												
1044				A-D Test Statistic	1.071					**Nonparametric Statistics**		
1045				5% A-D Critical Value	0.76					Kaplan-Meier (KM) Method		
1046				K-S Test Statistic	0.76					Mean	0.00657	
1047				5% K-S Critical Value	0.277					SD	0.0168	
1048	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean	0.00311	
1049										95% KM (t) UCL	0.0118	
1050	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0117	
1051				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0114	
1052				Minimum	0.00147					95% KM (bootstrap t) UCL	0.0275	
1053				Maximum	0.1					95% KM (BCA) UCL	0.0142	
1054				Mean	0.0148					95% KM (Percentile Bootstrap) UCL	0.0124	
1055				Median	0.0134					95% KM (Chebyshev) UCL	0.0201	
1056				SD	0.0162					97.5% KM (Chebyshev) UCL	0.026	
1057				k star	1.542					99% KM (Chebyshev) UCL	0.0375	
1058				Theta star	0.0096							
1059				Nu star	104.9					**Potential UCLs to Use**		
1060				AppChi2	82.24					95% KM (t) UCL	0.0118	

1061				95% Gamma Approximate UCL		0.0189						
1062				95% Adjusted Gamma UCL		0.0191						
1063	**Note: DL/2 is not a recommended method.**											
1064												
1065												
1066	**Copper, dissolved (mw-20-70)**											
1067												
1068					**General Statistics**							
1069				Number of Valid Data		36			Number of Detected Data		16	
1070				Number of Distinct Detected Data		16			Number of Non-Detect Data		20	
1071									Percent Non-Detects		55.56%	
1072												
1073				**Raw Statistics**					**Log-transformed Statistics**			
1074				Minimum Detected		0.00107			Minimum Detected		-6.84	
1075				Maximum Detected		0.0785			Maximum Detected		-2.545	
1076				Mean of Detected		0.00977			Mean of Detected		-5.346	
1077				SD of Detected		0.0189			SD of Detected		1.025	
1078				Minimum Non-Detect		0.001			Minimum Non-Detect		-6.908	
1079				Maximum Non-Detect		0.4			Maximum Non-Detect		-0.916	
1080												
1081	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect		36	
1082	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected		0	
1083	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage		100.00%	
1084												
1085					**UCL Statistics**							
1086				**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**			
1087				Shapiro Wilk Test Statistic		0.443			Shapiro Wilk Test Statistic		0.874	
1088				5% Shapiro Wilk Critical Value		0.887			5% Shapiro Wilk Critical Value		0.887	
1089				**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**			
1090												
1091				**Assuming Normal Distribution**					**Assuming Lognormal Distribution**			
1092				DL/2 Substitution Method					DL/2 Substitution Method			
1093				Mean		0.0121			Mean		-5.485	
1094				SD		0.0347			SD		1.216	
1095				95% DL/2 (t) UCL		0.0219			95% H-Stat (DL/2) UCL		0.0126	
1096												
1097				Maximum Likelihood Estimate(MLE) Method		N/A			Log ROS Method			
1098				**MLE method failed to converge properly**					Mean in Log Scale		-5.903	
1099									SD in Log Scale		1.028	
1100									Mean in Original Scale		0.00562	
1101									SD in Original Scale		0.013	
1102									95% Percentile Bootstrap UCL		0.00981	
1103									95% BCA Bootstrap UCL		0.012	
1104												
1105				**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**			
1106				k star (bias corrected)		0.711			**Data do not follow a Discernable Distribution (0.05)**			
1107				Theta Star		0.0137						
1108				nu star		22.76						
1109												
1110				A-D Test Statistic		1.835			**Nonparametric Statistics**			
1111				5% A-D Critical Value		0.771			Kaplan-Meier (KM) Method			
1112				K-S Test Statistic		0.771			Mean		0.0059	
1113				5% K-S Critical Value		0.223			SD		0.013	

1114	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00228
1115											95% KM (t) UCL	0.00975
1116	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00965
1117	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00959
1118	Minimum	1E-09									95% KM (bootstrap t) UCL	0.0204
1119	Maximum	0.0785									95% KM (BCA) UCL	0.0108
1120	Mean	0.00912									95% KM (Percentile Bootstrap) UCL	0.0101
1121	Median	0.0039									95% KM (Chebyshev) UCL	0.0158
1122	SD	0.0141									97.5% KM (Chebyshev) UCL	0.0201
1123	k star	0.238									99% KM (Chebyshev) UCL	0.0286
1124	Theta star	0.0383										
1125	Nu star	17.15									**Potential UCLs to Use**	
1126	AppChi2	8.78									95% KM (BCA) UCL	0.0108
1127	95% Gamma Approximate UCL	0.0178										
1128	95% Adjusted Gamma UCL	0.0184										
1129	**Note: DL/2 is not a recommended method.**											
1130												
1131												
1132	**Copper, dissolved (mw-21)**											
1133												
1134	**General Statistics**											
1135	Number of Valid Data	25									Number of Detected Data	17
1136	Number of Distinct Detected Data	16									Number of Non-Detect Data	8
1137											Percent Non-Detects	32.00%
1138												
1139	**Raw Statistics**										**Log-transformed Statistics**	
1140	Minimum Detected	0.0047									Minimum Detected	-5.36
1141	Maximum Detected	0.111									Maximum Detected	-2.198
1142	Mean of Detected	0.0221									Mean of Detected	-4.301
1143	SD of Detected	0.0269									SD of Detected	0.959
1144	Minimum Non-Detect	0.01									Minimum Non-Detect	-4.605
1145	Maximum Non-Detect	0.4									Maximum Non-Detect	-0.916
1146												
1147	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	25
1148	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1149	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1150												
1151	**UCL Statistics**											
1152	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
1153	Shapiro Wilk Test Statistic	0.673									Shapiro Wilk Test Statistic	0.902
1154	5% Shapiro Wilk Critical Value	0.892									5% Shapiro Wilk Critical Value	0.892
1155	**Data not Normal at 5% Significance Level**										**Data appear Lognormal at 5% Significance Level**	
1156												
1157	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
1158	DL/2 Substitution Method										DL/2 Substitution Method	
1159	Mean	0.0248									Mean	-4.413
1160	SD	0.0432									SD	1.053
1161	95% DL/2 (t) UCL	0.0396									95% H-Stat (DL/2) UCL	0.0306
1162												
1163	Maximum Likelihood Estimate(MLE) Method	N/A									Log ROS Method	
1164	**MLE method failed to converge properly**										Mean in Log Scale	-4.487
1165											SD in Log Scale	0.858
1166											Mean in Original Scale	0.0176

1167											SD in Original Scale	0.023
1168											95% Percentile Bootstrap UCL	0.0256
1169											95% BCA Bootstrap UCL	0.0294
1170												
1171	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1172					k star (bias corrected)	0.998	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
1173					Theta Star	0.0221						
1174					nu star	33.94						
1175												
1176					A-D Test Statistic	0.913	**Nonparametric Statistics**					
1177					5% A-D Critical Value	0.763					Kaplan-Meier (KM) Method	
1178					K-S Test Statistic	0.763					Mean	0.0176
1179					5% K-S Critical Value	0.214					SD	0.0231
1180	**Data follow Appr. Gamma Distribution at 5% Significance Level**										SE of Mean	0.00486
1181											95% KM (t) UCL	0.0259
1182	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0256
1183					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0259
1184					Minimum	0.0047					95% KM (bootstrap t) UCL	0.0334
1185					Maximum	0.111					95% KM (BCA) UCL	0.0269
1186					Mean	0.022					95% KM (Percentile Bootstrap) UCL	0.0258
1187					Median	0.0191					95% KM (Chebyshev) UCL	0.0388
1188					SD	0.022					97.5% KM (Chebyshev) UCL	0.048
1189					k star	1.468					99% KM (Chebyshev) UCL	0.066
1190					Theta star	0.015						
1191					Nu star	73.41	**Potential UCLs to Use**					
1192					AppChi2	54.68					95% KM (BCA) UCL	0.0269
1193					95% Gamma Approximate UCL	0.0296						
1194					95% Adjusted Gamma UCL	0.0302						
1195	**Note: DL/2 is not a recommended method.**											
1196												
1197												
1198	**Copper, dissolved (mw-22)**											
1199												
1200	**General Statistics**											
1201					Number of Valid Data	27					Number of Detected Data	14
1202					Number of Distinct Detected Data	14					Number of Non-Detect Data	13
1203											Percent Non-Detects	48.15%
1204												
1205	**Raw Statistics**						**Log-transformed Statistics**					
1206					Minimum Detected	0.0033					Minimum Detected	-5.714
1207					Maximum Detected	0.2					Maximum Detected	-1.609
1208					Mean of Detected	0.0325					Mean of Detected	-4.474
1209					SD of Detected	0.0613					SD of Detected	1.293
1210					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
1211					Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
1212												
1213	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	27
1214	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1215	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1216												
1217	**UCL Statistics**											
1218	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1219					Shapiro Wilk Test Statistic	0.525					Shapiro Wilk Test Statistic	0.81

1220				5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874
1221	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**	
1222											
1223	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
1224				DL/2 Substitution Method						DL/2 Substitution Method	
1225				Mean	0.0269					Mean	-4.674
1226				SD	0.057					SD	1.166
1227				95% DL/2 (t) UCL	0.0456					95% H-Stat (DL/2) UCL	0.0287
1228											
1229				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1230	**MLE method failed to converge properly**									Mean in Log Scale	-4.772
1231										SD in Log Scale	1.044
1232										Mean in Original Scale	0.0203
1233										SD in Original Scale	0.0453
1234										95% Percentile Bootstrap UCL	0.0362
1235										95% BCA Bootstrap UCL	0.0439
1236											
1237	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**	
1238				k star (bias corrected)	0.512					**Data do not follow a Discernable Distribution (0.05)**	
1239				Theta Star	0.0636						
1240				nu star	14.33						
1241											
1242				A-D Test Statistic	1.903					**Nonparametric Statistics**	
1243				5% A-D Critical Value	0.785					Kaplan-Meier (KM) Method	
1244				K-S Test Statistic	0.785					Mean	0.0202
1245				5% K-S Critical Value	0.24					SD	0.0454
1246	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00924
1247										95% KM (t) UCL	0.0359
1248	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0354
1249				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0357
1250				Minimum	0.0033					95% KM (bootstrap t) UCL	0.139
1251				Maximum	0.2					95% KM (BCA) UCL	0.037
1252				Mean	0.0331					95% KM (Percentile Bootstrap) UCL	0.0365
1253				Median	0.0274					95% KM (Chebyshev) UCL	0.0604
1254				SD	0.0435					97.5% KM (Chebyshev) UCL	0.0779
1255				k star	0.953					99% KM (Chebyshev) UCL	0.112
1256				Theta star	0.0348						
1257				Nu star	51.46					**Potential UCLs to Use**	
1258				AppChi2	35.99					97.5% KM (Chebyshev) UCL	0.0779
1259				95% Gamma Approximate UCL	0.0474						
1260				95% Adjusted Gamma UCL	0.0485						
1261	**Note: DL/2 is not a recommended method.**										
1262											
1263											
1264	**Copper, dissolved (mw-23)**										
1265											
1266										**General Statistics**	
1267				Number of Valid Data	26					Number of Detected Data	10
1268				Number of Distinct Detected Data	10					Number of Non-Detect Data	16
1269										Percent Non-Detects	61.54%
1270											
1271	**Raw Statistics**									**Log-transformed Statistics**	
1272				Minimum Detected	0.0031					Minimum Detected	-5.776

1273					Maximum Detected	0.1					Maximum Detected	-2.303
1274					Mean of Detected	0.0194					Mean of Detected	-4.72
1275					SD of Detected	0.0313					SD of Detected	1.152
1276					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
1277					Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
1278												
1279	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	26
1280	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1281	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1282												
1283	**UCL Statistics**											
1284	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1285					Shapiro Wilk Test Statistic	0.584					Shapiro Wilk Test Statistic	0.805
1286					5% Shapiro Wilk Critical Value	0.842					5% Shapiro Wilk Critical Value	0.842
1287	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1288												
1289	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1290					DL/2 Substitution Method						DL/2 Substitution Method	
1291					Mean	0.0185					Mean	-4.872
1292					SD	0.0421					SD	1.003
1293					95% DL/2 (t) UCL	0.0326					95% H-Stat (DL/2) UCL	0.018
1294												
1295					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1296	**MLE method failed to converge properly**										Mean in Log Scale	-5.035
1297											SD in Log Scale	0.864
1298											Mean in Original Scale	0.0113
1299											SD in Original Scale	0.0201
1300											95% Percentile Bootstrap UCL	0.0185
1301											95% BCA Bootstrap UCL	0.022
1302												
1303	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1304					k star (bias corrected)	0.605	**Data do not follow a Discernable Distribution (0.05)**					
1305					Theta Star	0.032						
1306					nu star	12.1						
1307												
1308					A-D Test Statistic	1.352	**Nonparametric Statistics**					
1309					5% A-D Critical Value	0.756	Kaplan-Meier (KM) Method					
1310					K-S Test Statistic	0.756					Mean	0.0108
1311					5% K-S Critical Value	0.276					SD	0.0201
1312	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00425
1313											95% KM (t) UCL	0.018
1314	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0178
1315					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0178
1316					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0564
1317					Maximum	0.1					95% KM (BCA) UCL	0.0185
1318					Mean	0.0175					95% KM (Percentile Bootstrap) UCL	0.0176
1319					Median	0.0118					95% KM (Chebyshev) UCL	0.0293
1320					SD	0.0199					97.5% KM (Chebyshev) UCL	0.0373
1321					k star	0.586					99% KM (Chebyshev) UCL	0.0531
1322					Theta star	0.0299						
1323					Nu star	30.49	**Potential UCLs to Use**					
1324					AppChi2	18.88					95% KM (BCA) UCL	0.0185
1325					95% Gamma Approximate UCL	0.0283						

1326					95% Adjusted Gamma UCL	0.0292						
1327	**Note: DL/2 is not a recommended method.**											
1328												
1329												
1330	**Copper, dissolved (mw-24a)**											
1331												
1332	**General Statistics**											
1333					Number of Valid Data	25				Number of Detected Data	10	
1334					Number of Distinct Detected Data	10				Number of Non-Detect Data	15	
1335										Percent Non-Detects	60.00%	
1336												
1337	**Raw Statistics**						**Log-transformed Statistics**					
1338					Minimum Detected	0.0027				Minimum Detected	-5.915	
1339					Maximum Detected	0.076				Maximum Detected	-2.577	
1340					Mean of Detected	0.0133				Mean of Detected	-4.942	
1341					SD of Detected	0.0223				SD of Detected	0.977	
1342					Minimum Non-Detect	0.01				Minimum Non-Detect	-4.605	
1343					Maximum Non-Detect	0.02				Maximum Non-Detect	-3.912	
1344												
1345	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	24	
1346	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
1347	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	96.00%	
1348												
1349	**UCL Statistics**											
1350	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1351					Shapiro Wilk Test Statistic	0.503				Shapiro Wilk Test Statistic	0.838	
1352					5% Shapiro Wilk Critical Value	0.842				5% Shapiro Wilk Critical Value	0.842	
1353	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1354												
1355	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1356					DL/2 Substitution Method					DL/2 Substitution Method		
1357					Mean	0.00874				Mean	-5.095	
1358					SD	0.0143				SD	0.639	
1359					95% DL/2 (t) UCL	0.0136				95% H-Stat (DL/2) UCL	0.00971	
1360												
1361					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1362	**MLE method failed to converge properly**									Mean in Log Scale	-5.138	
1363										SD in Log Scale	0.758	
1364										Mean in Original Scale	0.00888	
1365										SD in Original Scale	0.0144	
1366										95% Percentile Bootstrap UCL	0.0144	
1367										95% BCA Bootstrap UCL	0.0177	
1368												
1369	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1370					k star (bias corrected)	0.722	**Data do not follow a Discernable Distribution (0.05)**					
1371					Theta Star	0.0184						
1372					nu star	14.45						
1373												
1374					A-D Test Statistic	1.246	**Nonparametric Statistics**					
1375					5% A-D Critical Value	0.75				Kaplan-Meier (KM) Method		
1376					K-S Test Statistic	0.75				Mean	0.00848	
1377					5% K-S Critical Value	0.274				SD	0.0141	
1378	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00302	

1379											95% KM (t) UCL	0.0136
1380	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0134
1381				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.0135
1382					Minimum	0.00116					95% KM (bootstrap t) UCL	0.0258
1383					Maximum	0.076					95% KM (BCA) UCL	0.0143
1384					Mean	0.0124					95% KM (Percentile Bootstrap) UCL	0.0141
1385					Median	0.0092					95% KM (Chebyshev) UCL	0.0217
1386					SD	0.0144					97.5% KM (Chebyshev) UCL	0.0273
1387					k star	1.373					99% KM (Chebyshev) UCL	0.0385
1388					Theta star	0.00901						
1389					Nu star	68.64					**Potential UCLs to Use**	
1390					AppChi2	50.57					95% KM (t) UCL	0.0136
1391				95% Gamma Approximate UCL		0.0168					95% KM (% Bootstrap) UCL	0.0141
1392				95% Adjusted Gamma UCL		0.0171						
1393	**Note: DL/2 is not a recommended method.**											
1394												
1395												
1396	**Copper, dissolved (mw-24b)**											
1397												
1398	**General Statistics**											
1399				Number of Valid Data		23					Number of Detected Data	8
1400				Number of Distinct Detected Data		8					Number of Non-Detect Data	15
1401											Percent Non-Detects	65.22%
1402												
1403	**Raw Statistics**										**Log-transformed Statistics**	
1404					Minimum Detected	0.0026					Minimum Detected	-5.952
1405					Maximum Detected	0.019					Maximum Detected	-3.963
1406					Mean of Detected	0.00694					Mean of Detected	-5.219
1407					SD of Detected	0.00598					SD of Detected	0.696
1408					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
1409					Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
1410												
1411	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	23
1412	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1413	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1414												
1415	**Warning: There are only 8 Detected Values in this data**											
1416	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1417	**the resulting calculations may not be reliable enough tp draw conclusions**											
1418												
1419	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1420												
1421												
1422	**UCL Statistics**											
1423	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
1424					Shapiro Wilk Test Statistic	0.687					Shapiro Wilk Test Statistic	0.782
1425					5% Shapiro Wilk Critical Value	0.818					5% Shapiro Wilk Critical Value	0.818
1426	**Data not Normal at 5% Significance Level**										**Data not Lognormal at 5% Significance Level**	
1427												
1428	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
1429					DL/2 Substitution Method						DL/2 Substitution Method	
1430					Mean	0.0142					Mean	-5.17
1431					SD	0.0407					SD	1.011

1432				95% DL/2 (t) UCL	0.0288					95% H-Stat (DL/2) UCL	0.0172	
1433												
1434				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1435				**MLE method failed to converge properly**						Mean in Log Scale	-5.537	
1436										SD in Log Scale	0.599	
1437										Mean in Original Scale	0.00481	
1438										SD in Original Scale	0.00395	
1439										95% Percentile Bootstrap UCL	0.00631	
1440										95% BCA Bootstrap UCL	0.0067	
1441												
1442				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1443				k star (bias corrected)	1.437					**Data do not follow a Discernable Distribution (0.05)**		
1444				Theta Star	0.00483							
1445				nu star	22.99							
1446												
1447				A-D Test Statistic	1.151					**Nonparametric Statistics**		
1448				5% A-D Critical Value	0.724					Kaplan-Meier (KM) Method		
1449				K-S Test Statistic	0.724					Mean	0.00485	
1450				5% K-S Critical Value	0.297					SD	0.00386	
1451				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0009226	
1452										95% KM (t) UCL	0.00643	
1453				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00637	
1454				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00631	
1455				Minimum	0.0026					95% KM (bootstrap t) UCL	0.01	
1456				Maximum	0.019					95% KM (BCA) UCL	0.0066	
1457				Mean	0.0069					95% KM (Percentile Bootstrap) UCL	0.00649	
1458				Median	0.00676					95% KM (Chebyshev) UCL	0.00887	
1459				SD	0.00339					97.5% KM (Chebyshev) UCL	0.0106	
1460				k star	5.157					99% KM (Chebyshev) UCL	0.014	
1461				Theta star	0.00134							
1462				Nu star	237.2					**Potential UCLs to Use**		
1463				AppChi2	202.6					95% KM (t) UCL	0.00643	
1464				95% Gamma Approximate UCL	0.00808					95% KM (% Bootstrap) UCL	0.00649	
1465				95% Adjusted Gamma UCL	0.00818							
1466	**Note: DL/2 is not a recommended method.**											
1467												
1468												
1469	**Copper, dissolved (mw-24br)**											
1470												
1471										**General Statistics**		
1472				Number of Valid Data	22					Number of Detected Data	8	
1473				Number of Distinct Detected Data	8					Number of Non-Detect Data	14	
1474										Percent Non-Detects	63.64%	
1475												
1476				**Raw Statistics**						**Log-transformed Statistics**		
1477				Minimum Detected	0.0025					Minimum Detected	-5.991	
1478				Maximum Detected	0.0655					Maximum Detected	-2.726	
1479				Mean of Detected	0.0173					Mean of Detected	-4.695	
1480				SD of Detected	0.0227					SD of Detected	1.145	
1481				Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605	
1482				Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916	
1483												
1484	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	22	

	A	B	C	D	E	F	G	H	I	J	K	L
1485	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1486	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1487												
1488	**Warning: There are only 8 Detected Values in this data**											
1489	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1490	**the resulting calculations may not be reliable enough tp draw conclusions**											
1491												
1492	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1493												
1494												
1495	**UCL Statistics**											
1496	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1497	Shapiro Wilk Test Statistic					0.701	Shapiro Wilk Test Statistic					0.889
1498	5% Shapiro Wilk Critical Value					0.818	5% Shapiro Wilk Critical Value					0.818
1499	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1500												
1501	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1502	DL/2 Substitution Method						DL/2 Substitution Method					
1503	Mean					0.0189	Mean					-4.838
1504	SD					0.0429	SD					1.024
1505	95% DL/2 (t) UCL					0.0346	95% H-Stat (DL/2) UCL					0.0213
1506												
1507	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1508	**MLE method failed to converge properly**						Mean in Log Scale					-5.109
1509							SD in Log Scale					0.859
1510							Mean in Original Scale					0.00978
1511							SD in Original Scale					0.0145
1512							95% Percentile Bootstrap UCL					0.0153
1513							95% BCA Bootstrap UCL					0.0179
1514												
1515	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1516	k star (bias corrected)					0.655	**Data appear Lognormal at 5% Significance Level**					
1517	Theta Star					0.0264						
1518	nu star					10.47						
1519												
1520	A-D Test Statistic					0.74	**Nonparametric Statistics**					
1521	5% A-D Critical Value					0.739	Kaplan-Meier (KM) Method					
1522	K-S Test Statistic					0.739	Mean					0.00948
1523	5% K-S Critical Value					0.302	SD					0.0145
1524	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.00341
1525							95% KM (t) UCL					0.0154
1526	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0151
1527	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0151
1528	Minimum					0.0025	95% KM (bootstrap t) UCL					0.035
1529	Maximum					0.0655	95% KM (BCA) UCL					0.0153
1530	Mean					0.0156	95% KM (Percentile Bootstrap) UCL					0.0158
1531	Median					0.0125	95% KM (Chebyshev) UCL					0.0244
1532	SD					0.014	97.5% KM (Chebyshev) UCL					0.0308
1533	k star					1.562	99% KM (Chebyshev) UCL					0.0434
1534	Theta star					0.00996						
1535	Nu star					68.75	**Potential UCLs to Use**					
1536	AppChi2					50.66	95% KM (BCA) UCL					0.0153
1537	95% Gamma Approximate UCL					0.0211						

1538					95% Adjusted Gamma UCL	0.0216						
1539	**Note: DL/2 is not a recommended method.**											
1540												
1541												
1542	**Copper, dissolved (mw-25)**											
1543												
1544	**General Statistics**											
1545					Number of Valid Data	29				Number of Detected Data	7	
1546					Number of Distinct Detected Data	7				Number of Non-Detect Data	22	
1547										Percent Non-Detects	75.86%	
1548												
1549	**Raw Statistics**						**Log-transformed Statistics**					
1550					Minimum Detected	0.00134				Minimum Detected	-6.615	
1551					Maximum Detected	0.02				Maximum Detected	-3.912	
1552					Mean of Detected	0.00813				Mean of Detected	-5.095	
1553					SD of Detected	0.00623				SD of Detected	0.875	
1554					Minimum Non-Detect	0.001				Minimum Non-Detect	-6.908	
1555					Maximum Non-Detect	0.4				Maximum Non-Detect	-0.916	
1556												
1557	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	29	
1558	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1559	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1560												
1561	**Warning: There are only 7 Detected Values in this data**											
1562	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1563	**the resulting calculations may not be reliable enough tp draw conclusions**											
1564												
1565	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1566												
1567												
1568	**UCL Statistics**											
1569	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1570					Shapiro Wilk Test Statistic	0.908				Shapiro Wilk Test Statistic	0.972	
1571					5% Shapiro Wilk Critical Value	0.803				5% Shapiro Wilk Critical Value	0.803	
1572	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1573												
1574	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1575					DL/2 Substitution Method					DL/2 Substitution Method		
1576					Mean	0.0122				Mean	-5.42	
1577					SD	0.0364				SD	1.221	
1578					95% DL/2 (t) UCL	0.0237				95% H-Stat (DL/2) UCL	0.0189	
1579												
1580					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1581	**MLE method failed to converge properly**									Mean in Log Scale	-6.137	
1582										SD in Log Scale	0.944	
1583										Mean in Original Scale	0.00345	
1584										SD in Original Scale	0.00414	
1585										95% Percentile Bootstrap UCL	0.00475	
1586										95% BCA Bootstrap UCL	0.00524	
1587												
1588	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1589					k star (bias corrected)	1.19	**Data appear Normal at 5% Significance Level**					
1590					Theta Star	0.00684						

1591					nu star	16.66						
1592												
1593					A-D Test Statistic	0.162	**Nonparametric Statistics**					
1594					5% A-D Critical Value	0.716					Kaplan-Meier (KM) Method	
1595					K-S Test Statistic	0.716					Mean	0.00403
1596					5% K-S Critical Value	0.315					SD	0.00425
1597	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00104
1598											95% KM (t) UCL	0.00581
1599	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00575
1600	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0057
1601					Minimum	0.00134					95% KM (bootstrap t) UCL	0.00576
1602					Maximum	0.02					95% KM (BCA) UCL	0.00807
1603					Mean	0.00887					95% KM (Percentile Bootstrap) UCL	0.0076
1604					Median	0.00862					95% KM (Chebyshev) UCL	0.00858
1605					SD	0.00348					97.5% KM (Chebyshev) UCL	0.0105
1606					k star	5.055					99% KM (Chebyshev) UCL	0.0144
1607					Theta star	0.00176						
1608					Nu star	293.2	**Potential UCLs to Use**					
1609					AppChi2	254.5					95% KM (t) UCL	0.00581
1610					95% Gamma Approximate UCL	0.0102					95% KM (Percentile Bootstrap) UCL	0.0076
1611					95% Adjusted Gamma UCL	0.0103						
1612	**Note: DL/2 is not a recommended method.**											
1613												
1614												
1615	**Copper, dissolved (mw-26)**											
1616												
1617	**General Statistics**											
1618					Number of Valid Data	25					Number of Detected Data	13
1619					Number of Distinct Detected Data	13					Number of Non-Detect Data	12
1620											Percent Non-Detects	48.00%
1621												
1622	**Raw Statistics**						**Log-transformed Statistics**					
1623					Minimum Detected	0.0037					Minimum Detected	-5.599
1624					Maximum Detected	0.0342					Maximum Detected	-3.376
1625					Mean of Detected	0.00856					Mean of Detected	-5.01
1626					SD of Detected	0.00845					SD of Detected	0.638
1627					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
1628					Maximum Non-Detect	0.0278					Maximum Non-Detect	-3.583
1629												
1630	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	24
1631	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
1632	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	96.00%
1633												
1634	**UCL Statistics**											
1635	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1636					Shapiro Wilk Test Statistic	0.59					Shapiro Wilk Test Statistic	0.81
1637					5% Shapiro Wilk Critical Value	0.866					5% Shapiro Wilk Critical Value	0.866
1638	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1639												
1640	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1641					DL/2 Substitution Method						DL/2 Substitution Method	
1642					Mean	0.00746					Mean	-5.071
1643					SD	0.00638					SD	0.509

1644				95% DL/2 (t) UCL	0.00964					95% H-Stat (DL/2) UCL	0.0085	
1645												
1646				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1647				**MLE method failed to converge properly**						Mean in Log Scale	-5.087	
1648										SD in Log Scale	0.509	
1649										Mean in Original Scale	0.00731	
1650										SD in Original Scale	0.00626	
1651										95% Percentile Bootstrap UCL	0.00957	
1652										95% BCA Bootstrap UCL	0.011	
1653												
1654				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1655				k star (bias corrected)	1.71					**Data do not follow a Discernable Distribution (0.05)**		
1656				Theta Star	0.00501							
1657				nu star	44.45							
1658												
1659				A-D Test Statistic	1.388					**Nonparametric Statistics**		
1660				5% A-D Critical Value	0.743					Kaplan-Meier (KM) Method		
1661				K-S Test Statistic	0.743					Mean	0.00712	
1662				5% K-S Critical Value	0.239					SD	0.00617	
1663				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00133	
1664										95% KM (t) UCL	0.00939	
1665				**Assuming Gamma Distribution**						95% KM (z) UCL	0.0093	
1666				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00935	
1667				Minimum	0.0037					95% KM (bootstrap t) UCL	0.0127	
1668				Maximum	0.0342					95% KM (BCA) UCL	0.0095	
1669				Mean	0.00838					95% KM (Percentile Bootstrap) UCL	0.00933	
1670				Median	0.00747					95% KM (Chebyshev) UCL	0.0129	
1671				SD	0.00603					97.5% KM (Chebyshev) UCL	0.0154	
1672				k star	3.435					99% KM (Chebyshev) UCL	0.0203	
1673				Theta star	0.00244							
1674				Nu star	171.7					**Potential UCLs to Use**		
1675				AppChi2	142.4					95% KM (t) UCL	0.00939	
1676				95% Gamma Approximate UCL	0.0101					95% KM (% Bootstrap) UCL	0.00933	
1677				95% Adjusted Gamma UCL	0.0102							
1678	**Note: DL/2 is not a recommended method.**											
1679												
1680												
1681	**Copper, dissolved (mw-27-20)**											
1682												
1683										**General Statistics**		
1684				Number of Valid Data	22					Number of Detected Data	11	
1685				Number of Distinct Detected Data	11					Number of Non-Detect Data	11	
1686										Percent Non-Detects	50.00%	
1687												
1688				**Raw Statistics**						**Log-transformed Statistics**		
1689				Minimum Detected	0.0033					Minimum Detected	-5.714	
1690				Maximum Detected	0.0961					Maximum Detected	-2.342	
1691				Mean of Detected	0.016					Mean of Detected	-4.742	
1692				SD of Detected	0.027					SD of Detected	0.961	
1693				Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605	
1694				Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912	
1695												
1696	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	20	

1697	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					2
1698	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					90.91%
1699												
1700	**UCL Statistics**											
1701	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1702	Shapiro Wilk Test Statistic				0.495		Shapiro Wilk Test Statistic					0.845
1703	5% Shapiro Wilk Critical Value				0.85		5% Shapiro Wilk Critical Value					0.85
1704	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1705												
1706	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1707	DL/2 Substitution Method						DL/2 Substitution Method					
1708	Mean				0.011		Mean					-4.947
1709	SD				0.0194		SD					0.72
1710	95% DL/2 (t) UCL				0.0181		95% H-Stat (DL/2) UCL					0.0114
1711												
1712	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
1713	**MLE method failed to converge properly**						Mean in Log Scale					-4.936
1714							SD in Log Scale					0.759
1715							Mean in Original Scale					0.0112
1716							SD in Original Scale					0.0194
1717							95% Percentile Bootstrap UCL					0.0188
1718							95% BCA Bootstrap UCL					0.0237
1719												
1720	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1721	k star (bias corrected)				0.754		**Data do not follow a Discernable Distribution (0.05)**					
1722	Theta Star				0.0213							
1723	nu star				16.59							
1724												
1725	A-D Test Statistic				1.302		**Nonparametric Statistics**					
1726	5% A-D Critical Value				0.754		Kaplan-Meier (KM) Method					
1727	K-S Test Statistic				0.754		Mean					0.011
1728	5% K-S Critical Value				0.263		SD					0.019
1729	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.00427
1730							95% KM (t) UCL					0.0183
1731	**Assuming Gamma Distribution**						95% KM (z) UCL					0.018
1732	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0182
1733	Minimum				0.0033		95% KM (bootstrap t) UCL					0.0404
1734	Maximum				0.0961		95% KM (BCA) UCL					0.0191
1735	Mean				0.0159		95% KM (Percentile Bootstrap) UCL					0.0189
1736	Median				0.0147		95% KM (Chebyshev) UCL					0.0296
1737	SD				0.0187		97.5% KM (Chebyshev) UCL					0.0376
1738	k star				1.571		99% KM (Chebyshev) UCL					0.0535
1739	Theta star				0.0101							
1740	Nu star				69.14		**Potential UCLs to Use**					
1741	AppChi2				51		95% KM (t) UCL					0.0183
1742	95% Gamma Approximate UCL				0.0215		95% KM (% Bootstrap) UCL					0.0189
1743	95% Adjusted Gamma UCL				0.022							
1744	**Note: DL/2 is not a recommended method.**											
1745												
1746												
1747	**Copper, dissolved (mw-28-25)**											
1748												
1749	**General Statistics**											

1750				Number of Valid Data	21					Number of Detected Data	10	
1751				Number of Distinct Detected Data	9					Number of Non-Detect Data	11	
1752										Percent Non-Detects	52.38%	
1753												
1754	**Raw Statistics**						**Log-transformed Statistics**					
1755				Minimum Detected	0.0032					Minimum Detected	-5.745	
1756				Maximum Detected	0.0269					Maximum Detected	-3.616	
1757				Mean of Detected	0.00818					Mean of Detected	-5.067	
1758				SD of Detected	0.00757					SD of Detected	0.691	
1759				Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605	
1760				Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912	
1761												
1762	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	20	
1763	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
1764	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	95.24%	
1765												
1766	**UCL Statistics**											
1767	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1768				Shapiro Wilk Test Statistic	0.677					Shapiro Wilk Test Statistic	0.834	
1769				5% Shapiro Wilk Critical Value	0.842					5% Shapiro Wilk Critical Value	0.842	
1770	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1771												
1772	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1773				DL/2 Substitution Method						DL/2 Substitution Method		
1774				Mean	0.00705					Mean	-5.111	
1775				SD	0.00538					SD	0.504	
1776				95% DL/2 (t) UCL	0.00907					95% H-Stat (DL/2) UCL	0.00856	
1777												
1778				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1779	**MLE method failed to converge properly**									Mean in Log Scale	-5.184	
1780										SD in Log Scale	0.538	
1781										Mean in Original Scale	0.00668	
1782										SD in Original Scale	0.00544	
1783										95% Percentile Bootstrap UCL	0.00885	
1784										95% BCA Bootstrap UCL	0.00952	
1785												
1786	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1787				k star (bias corrected)	1.511		**Data do not follow a Discernable Distribution (0.05)**					
1788				Theta Star	0.00541							
1789				nu star	30.23							
1790												
1791				A-D Test Statistic	1.025		**Nonparametric Statistics**					
1792				5% A-D Critical Value	0.735					Kaplan-Meier (KM) Method		
1793				K-S Test Statistic	0.735					Mean	0.0065	
1794				5% K-S Critical Value	0.27					SD	0.00537	
1795	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0013	
1796										95% KM (t) UCL	0.00875	
1797	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00864	
1798				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00871	
1799				Minimum	0.0032					95% KM (bootstrap t) UCL	0.0113	
1800				Maximum	0.0269					95% KM (BCA) UCL	0.00917	
1801				Mean	0.00795					95% KM (Percentile Bootstrap) UCL	0.00875	
1802				Median	0.0071					95% KM (Chebyshev) UCL	0.0122	

1803					SD	0.00517				97.5% KM (Chebyshev) UCL		0.0146
1804					k star	3.418				99% KM (Chebyshev) UCL		0.0194
1805					Theta star	0.00233						
1806					Nu star	143.6	**Potential UCLs to Use**					
1807					AppChi2	116.9				95% KM (t) UCL		0.00875
1808					95% Gamma Approximate UCL	0.00977				95% KM (% Bootstrap) UCL		0.00875
1809					95% Adjusted Gamma UCL	0.00992						
1810	**Note: DL/2 is not a recommended method.**											
1811												
1812												
1813	**Copper, dissolved (mw-29)**											
1814												
1815	**General Statistics**											
1816					Number of Valid Data	22				Number of Detected Data		12
1817					Number of Distinct Detected Data	11				Number of Non-Detect Data		10
1818										Percent Non-Detects		45.45%
1819												
1820	**Raw Statistics**						**Log-transformed Statistics**					
1821					Minimum Detected	0.0031				Minimum Detected		-5.776
1822					Maximum Detected	0.0187				Maximum Detected		-3.979
1823					Mean of Detected	0.00875				Mean of Detected		-4.908
1824					SD of Detected	0.00511				SD of Detected		0.623
1825					Minimum Non-Detect	0.01				Minimum Non-Detect		-4.605
1826					Maximum Non-Detect	0.4				Maximum Non-Detect		-0.916
1827												
1828	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		22
1829	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1830	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1831												
1832	**UCL Statistics**											
1833	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1834					Shapiro Wilk Test Statistic	0.903				Shapiro Wilk Test Statistic		0.91
1835					5% Shapiro Wilk Critical Value	0.859				5% Shapiro Wilk Critical Value		0.859
1836	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1837												
1838	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1839					DL/2 Substitution Method					DL/2 Substitution Method		
1840					Mean	0.0164				Mean		-4.844
1841					SD	0.0412				SD		0.877
1842					95% DL/2 (t) UCL	0.0315				95% H-Stat (DL/2) UCL		0.0187
1843												
1844					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1845	**MLE method failed to converge properly**									Mean in Log Scale		-5.029
1846										SD in Log Scale		0.505
1847										Mean in Original Scale		0.00744
1848										SD in Original Scale		0.00411
1849										95% Percentile Bootstrap UCL		0.00894
1850										95% BCA Bootstrap UCL		0.00914
1851												
1852	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1853					k star (bias corrected)	2.392	**Data appear Normal at 5% Significance Level**					
1854					Theta Star	0.00366						
1855					nu star	57.4						

1856												
1857					A-D Test Statistic	0.491	**Nonparametric Statistics**					
1858					5% A-D Critical Value	0.739					Kaplan-Meier (KM) Method	
1859					K-S Test Statistic	0.739					Mean	0.00771
1860					5% K-S Critical Value	0.247					SD	0.00443
1861				**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean	0.00119
1862											95% KM (t) UCL	0.00976
1863				**Assuming Gamma Distribution**							95% KM (z) UCL	0.00967
1864					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00979
1865					Minimum	0.0031					95% KM (bootstrap t) UCL	0.0102
1866					Maximum	0.0187					95% KM (BCA) UCL	0.00955
1867					Mean	0.009					95% KM (Percentile Bootstrap) UCL	0.00963
1868					Median	0.0093					95% KM (Chebyshev) UCL	0.0129
1869					SD	0.00395					97.5% KM (Chebyshev) UCL	0.0151
1870					k star	4.324					99% KM (Chebyshev) UCL	0.0195
1871					Theta star	0.00208						
1872					Nu star	190.3	**Potential UCLs to Use**					
1873					AppChi2	159.4					95% KM (t) UCL	0.00976
1874					95% Gamma Approximate UCL	0.0107					95% KM (Percentile Bootstrap) UCL	0.00963
1875					95% Adjusted Gamma UCL	0.0109						
1876	**Note: DL/2 is not a recommended method.**											
1877												
1878												
1879	**Copper, dissolved (mw-3)**											
1880												
1881					**General Statistics**							
1882					Number of Valid Data	5					Number of Detected Data	3
1883					Number of Distinct Detected Data	3					Number of Non-Detect Data	2
1884											Percent Non-Detects	40.00%
1885												
1886				**Raw Statistics**			**Log-transformed Statistics**					
1887					Minimum Detected	0.00407					Minimum Detected	-5.504
1888					Maximum Detected	0.00485					Maximum Detected	-5.329
1889					Mean of Detected	0.00444					Mean of Detected	-5.42
1890					SD of Detected	0.0003915					SD of Detected	0.0878
1891					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
1892					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
1893												
1894												
1895	**Warning: There are only 3 Distinct Detected Values in this data set**											
1896	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1897	**Those methods will return a 'N/A' value on your output display!**											
1898												
1899	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1900	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1901												
1902												
1903					**UCL Statistics**							
1904				**Normal Distribution Test with Detected Values Only**			**Lognormal Distribution Test with Detected Values Only**					
1905					Shapiro Wilk Test Statistic	0.992					Shapiro Wilk Test Statistic	0.996
1906					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
1907				**Data appear Normal at 5% Significance Level**			**Data appear Lognormal at 5% Significance Level**					
1908												

	A	B	C	D	E	F	G	H	I	J	K	L
1909	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1910	DL/2 Substitution Method						DL/2 Substitution Method					
1911	Mean					0.00466	Mean					-5.371
1912	SD					0.0004132	SD					0.091
1913	95% DL/2 (t) UCL					0.00506	95% H-Stat (DL/2) UCL					0.0248
1914												
1915	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1916	**MLE method failed to converge properly**						Mean in Log Scale					-5.42
1917							SD in Log Scale					0.0737
1918							Mean in Original Scale					0.00444
1919							SD in Original Scale					0.0003278
1920							95% Percentile Bootstrap UCL					0.00465
1921							95% BCA Bootstrap UCL					0.00466
1922												
1923	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1924	k star (bias corrected)					N/A	**Data appear Normal at 5% Significance Level**					
1925	Theta Star					N/A						
1926	nu star					N/A						
1927												
1928	A-D Test Statistic					0.253	**Nonparametric Statistics**					
1929	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
1930	K-S Test Statistic					N/A	Mean					0.00444
1931	5% K-S Critical Value					N/A	SD					0.0003197
1932	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0002261
1933							95% KM (t) UCL					0.00492
1934	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00481
1935	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00497
1936	Minimum					N/A	95% KM (bootstrap t) UCL					0.00523
1937	Maximum					N/A	95% KM (BCA) UCL					0.0047
1938	Mean					N/A	95% KM (Percentile Bootstrap) UCL					0.00485
1939	Median					N/A	95% KM (Chebyshev) UCL					0.00543
1940	SD					N/A	97.5% KM (Chebyshev) UCL					0.00585
1941	k star					N/A	99% KM (Chebyshev) UCL					0.00669
1942	Theta star					N/A						
1943	Nu star					N/A	**Potential UCLs to Use**					
1944	AppChi2					N/A	95% KM (t) UCL					0.00492
1945	95% Gamma Approximate UCL					N/A	95% KM (Percentile Bootstrap) UCL					0.00485
1946	95% Adjusted Gamma UCL					N/A						
1947	**Warning: Recommended UCL exceeds the maximum observation**											
1948	**Note: DL/2 is not a recommended method.**											
1949												
1950												
1951	**Copper, dissolved (mw-30-30)**											
1952												
1953	**General Statistics**											
1954	Number of Valid Data					22	Number of Detected Data					11
1955	Number of Distinct Detected Data					10	Number of Non-Detect Data					11
1956							Percent Non-Detects					50.00%
1957												
1958	**Raw Statistics**						**Log-transformed Statistics**					
1959	Minimum Detected					0.0023	Minimum Detected					-6.075
1960	Maximum Detected					0.2	Maximum Detected					-1.609
1961	Mean of Detected					0.0252	Mean of Detected					-4.749

1962					SD of Detected	0.0583					SD of Detected	1.204
1963					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
1964					Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
1965												
1966	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	22
1967	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1968	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1969												
1970	**UCL Statistics**											
1971	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1972					Shapiro Wilk Test Statistic	0.418					Shapiro Wilk Test Statistic	0.793
1973					5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85
1974	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1975												
1976	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1977					DL/2 Substitution Method						DL/2 Substitution Method	
1978					Mean	0.0247					Mean	-4.751
1979					SD	0.0569					SD	1.119
1980					95% DL/2 (t) UCL	0.0456					95% H-Stat (DL/2) UCL	0.026
1981												
1982					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1983	**MLE method failed to converge properly**										Mean in Log Scale	-4.912
1984											SD in Log Scale	0.919
1985											Mean in Original Scale	0.0161
1986											SD in Original Scale	0.0413
1987											95% Percentile Bootstrap UCL	0.0335
1988											95% BCA Bootstrap UCL	0.0432
1989												
1990	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1991					k star (bias corrected)	0.483	**Data do not follow a Discernable Distribution (0.05)**					
1992					Theta Star	0.0522						
1993					nu star	10.63						
1994												
1995					A-D Test Statistic	1.889	**Nonparametric Statistics**					
1996					5% A-D Critical Value	0.775	Kaplan-Meier (KM) Method					
1997					K-S Test Statistic	0.775					Mean	0.016
1998					5% K-S Critical Value	0.268					SD	0.0414
1999	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00948
2000											95% KM (t) UCL	0.0323
2001	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0316
2002					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.032
2003					Minimum	0.0023					95% KM (bootstrap t) UCL	0.173
2004					Maximum	0.2					95% KM (BCA) UCL	0.0347
2005					Mean	0.025					95% KM (Percentile Bootstrap) UCL	0.0337
2006					Median	0.0181					95% KM (Chebyshev) UCL	0.0573
2007					SD	0.0404					97.5% KM (Chebyshev) UCL	0.0752
2008					k star	0.931					99% KM (Chebyshev) UCL	0.11
2009					Theta star	0.0269						
2010					Nu star	40.95	**Potential UCLs to Use**					
2011					AppChi2	27.28					95% KM (BCA) UCL	0.0347
2012					95% Gamma Approximate UCL	0.0376						
2013					95% Adjusted Gamma UCL	0.0388						
2014	**Note: DL/2 is not a recommended method.**											

	A	B	C	D	E	F	G	H	I	J	K	L
2015												
2016												
2017	**Copper, dissolved (mw-30-50)**											
2018												
2019						**General Statistics**						
2020					Number of Valid Data	6			Number of Detected Data			1
2021					Number of Distinct Detected Data	1			Number of Non-Detect Data			5
2022									Percent Non-Detects			83.33%
2023												
2024					**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**							
2025					**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**							
2026												
2027					**The data set for variable Copper, dissolved (mw-30-50) was not processed!**							
2028												
2029												
2030												
2031	**Copper, dissolved (mw-31-135)**											
2032												
2033						**General Statistics**						
2034					Number of Valid Data	1			Number of Detected Data			0
2035					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
2036									Percent Non-Detects			100.00%
2037												
2038					**Warning: This data set only has 1 observations!**							
2039					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
2040					**The data set for variable Copper, dissolved (mw-31-135) was not processed!**							
2041												
2042					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
2043					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
2044												
2045												
2046												
2047	**Copper, dissolved (mw-31-60)**											
2048												
2049						**General Statistics**						
2050					Number of Valid Data	23			Number of Detected Data			7
2051					Number of Distinct Detected Data	7			Number of Non-Detect Data			16
2052									Percent Non-Detects			69.57%
2053												
2054					**Raw Statistics**				**Log-transformed Statistics**			
2055					Minimum Detected	0.0037			Minimum Detected			-5.599
2056					Maximum Detected	0.05			Maximum Detected			-2.996
2057					Mean of Detected	0.0197			Mean of Detected			-4.395
2058					SD of Detected	0.0189			SD of Detected			1.075
2059					Minimum Non-Detect	0.005			Minimum Non-Detect			-5.298
2060					Maximum Non-Detect	0.4			Maximum Non-Detect			-0.916
2061												
2062	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			23
2063	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			0
2064	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
2065												
2066					**Warning: There are only 7 Detected Values in this data**							
2067					**Note: It should be noted that even though bootstrap may be performed on this data set**							

	A	B	C	D	E	F	G	H	I	J	K	L
2068	the resulting calculations may not be reliable enough tp draw conclusions											
2069												
2070	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
2071												
2072												
2073	UCL Statistics											
2074	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
2075	Shapiro Wilk Test Statistic					0.831	Shapiro Wilk Test Statistic					0.897
2076	5% Shapiro Wilk Critical Value					0.803	5% Shapiro Wilk Critical Value					0.803
2077	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
2078												
2079	Assuming Normal Distribution						Assuming Lognormal Distribution					
2080	DL/2 Substitution Method						DL/2 Substitution Method					
2081	Mean					0.0185	Mean					-4.807
2082	SD					0.0413	SD					1.016
2083	95% DL/2 (t) UCL					0.0333	95% H-Stat (DL/2) UCL					0.02
2084												
2085	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2086	MLE method failed to converge properly						Mean in Log Scale					-5.085
2087							SD in Log Scale					0.841
2088							Mean in Original Scale					0.00953
2089							SD in Original Scale					0.0122
2090							95% Percentile Bootstrap UCL					0.0139
2091							95% BCA Bootstrap UCL					0.0151
2092												
2093	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
2094	k star (bias corrected)					0.788	Data appear Normal at 5% Significance Level					
2095	Theta Star					0.0249						
2096	nu star					11.04						
2097												
2098	A-D Test Statistic					0.44	Nonparametric Statistics					
2099	5% A-D Critical Value					0.725	Kaplan-Meier (KM) Method					
2100	K-S Test Statistic					0.725	Mean					0.00944
2101	5% K-S Critical Value					0.318	SD					0.0122
2102	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.00284
2103							95% KM (t) UCL					0.0143
2104	Assuming Gamma Distribution						95% KM (z) UCL					0.0141
2105	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0141
2106	Minimum					0.0037	95% KM (bootstrap t) UCL					0.019
2107	Maximum					0.05	95% KM (BCA) UCL					0.0159
2108	Mean					0.0173	95% KM (Percentile Bootstrap) UCL					0.0148
2109	Median					0.0155	95% KM (Chebyshev) UCL					0.0218
2110	SD					0.0111	97.5% KM (Chebyshev) UCL					0.0272
2111	k star					2.41	99% KM (Chebyshev) UCL					0.0377
2112	Theta star					0.00716						
2113	Nu star					110.9	Potential UCLs to Use					
2114	AppChi2					87.55	95% KM (t) UCL					0.0143
2115	95% Gamma Approximate UCL					0.0219	95% KM (Percentile Bootstrap) UCL					0.0148
2116	95% Adjusted Gamma UCL					0.0222						
2117	Note: DL/2 is not a recommended method.											
2118												
2119												
2120	Copper, dissolved (mw-32-20)											

2121												
2122						General Statistics						
2123					Number of Valid Data	6			Number of Detected Data	1		
2124					Number of Distinct Detected Data	1			Number of Non-Detect Data	5		
2125									Percent Non-Detects	83.33%		
2126												
2127						Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!						
2128						It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).						
2129												
2130						The data set for variable Copper, dissolved (mw-32-20) was not processed!						
2131												
2132												
2133												
2134	Copper, dissolved (mw-32-35)											
2135												
2136						General Statistics						
2137					Number of Valid Data	9			Number of Detected Data	0		
2138					Number of Distinct Detected Data	0			Number of Non-Detect Data	9		
2139									Percent Non-Detects	100.00%		
2140												
2141						Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!						
2142						Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!						
2143						The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).						
2144												
2145						The data set for variable Copper, dissolved (mw-32-35) was not processed!						
2146												
2147												
2148												
2149	Copper, dissolved (mw-33-210)											
2150												
2151						General Statistics						
2152					Number of Valid Data	1			Number of Detected Data	0		
2153					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
2154									Percent Non-Detects	100.00%		
2155												
2156						Warning: This data set only has 1 observations!						
2157						Data set is too small to compute reliable and meaningful statistics and estimates!						
2158						The data set for variable Copper, dissolved (mw-33-210) was not processed!						
2159												
2160						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
2161						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
2162												
2163												
2164												
2165	Copper, dissolved (mw-33-40)											
2166												
2167						General Statistics						
2168					Number of Valid Data	6			Number of Detected Data	1		
2169					Number of Distinct Detected Data	1			Number of Non-Detect Data	5		
2170									Percent Non-Detects	83.33%		
2171												
2172						Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!						
2173						It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).						

2174												
2175	**The data set for variable Copper, dissolved (mw-33-40) was not processed!**											
2176												
2177												
2178												
2179	**Copper, dissolved (mw-33-90)**											
2180												
2181	**General Statistics**											
2182						Number of Valid Data	6			Number of Detected Data	1	
2183						Number of Distinct Detected Data	1			Number of Non-Detect Data	5	
2184										Percent Non-Detects	83.33%	
2185												
2186	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
2187	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
2188												
2189	**The data set for variable Copper, dissolved (mw-33-90) was not processed!**											
2190												
2191												
2192												
2193	**Copper, dissolved (mw-34-100)**											
2194												
2195	**General Statistics**											
2196						Number of Valid Data	2			Number of Detected Data	0	
2197						Number of Distinct Detected Data	0			Number of Non-Detect Data	2	
2198										Percent Non-Detects	100.00%	
2199												
2200	**Warning: This data set only has 2 observations!**											
2201	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2202	**The data set for variable Copper, dissolved (mw-34-100) was not processed!**											
2203												
2204	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2205	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2206												
2207												
2208												
2209	**Copper, dissolved (mw-34-55)**											
2210												
2211	**General Statistics**											
2212						Number of Valid Data	14			Number of Detected Data	2	
2213						Number of Distinct Detected Data	2			Number of Non-Detect Data	12	
2214										Percent Non-Detects	85.71%	
2215												
2216	**Raw Statistics**							**Log-transformed Statistics**				
2217						Minimum Detected	0.0066			Minimum Detected	-5.021	
2218						Maximum Detected	0.012			Maximum Detected	-4.423	
2219						Mean of Detected	0.0093			Mean of Detected	-4.722	
2220						SD of Detected	0.00382			SD of Detected	0.423	
2221						Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908	
2222						Maximum Non-Detect	0.011			Maximum Non-Detect	-4.51	
2223												
2224	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	13	
2225	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
2226	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	92.86%	

	A	B	C	D	E	F	G	H	I	J	K	L
2227												
2228	**Warning: Data set has only 2 Distinct Detected Values.**											
2229	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
2230	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2231												
2232	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
2233												
2234	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2235	**Those methods will return a 'N/A' value on your output display!**											
2236												
2237	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2238	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2239												
2240												
2241	**UCL Statistics**											
2242	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2243	Shapiro Wilk Test Statistic					1	Shapiro Wilk Test Statistic					1
2244	5% Shapiro Wilk Critical Value					N/A	5% Shapiro Wilk Critical Value					N/A
2245	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2246												
2247	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2248	DL/2 Substitution Method						DL/2 Substitution Method					
2249	Mean					0.00434	Mean					-5.799
2250	SD					0.00303	SD					1.046
2251	95% DL/2 (t) UCL					0.00578	95% H-Stat (DL/2) UCL					0.0128
2252												
2253	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2254	**MLE method failed to converge properly**						Mean in Log Scale					N/A
2255							SD in Log Scale					N/A
2256							Mean in Original Scale					N/A
2257							SD in Original Scale					N/A
2258							95% Percentile Bootstrap UCL					N/A
2259							95% BCA Bootstrap UCL					N/A
2260												
2261	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2262	k star (bias corrected)					N/A	**Data do not follow a Discernable Distribution (0.05)**					
2263	Theta Star					N/A						
2264	nu star					N/A						
2265												
2266	A-D Test Statistic					0.359	**Nonparametric Statistics**					
2267	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
2268	K-S Test Statistic					N/A	Mean					0.00699
2269	5% K-S Critical Value					N/A	SD					0.00139
2270	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0005256
2271							95% KM (t) UCL					0.00792
2272	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00785
2273	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0106
2274	Minimum					N/A	95% KM (bootstrap t) UCL					1.8E+308
2275	Maximum					N/A	95% KM (BCA) UCL					0.012
2276	Mean					N/A	95% KM (Percentile Bootstrap) UCL					0.012
2277	Median					N/A	95% KM (Chebyshev) UCL					0.00928
2278	SD					N/A	97.5% KM (Chebyshev) UCL					0.0103
2279	k star					N/A	99% KM (Chebyshev) UCL					0.0122

2280					Theta star	N/A						
2281					Nu star	N/A	**Potential UCLs to Use**					
2282					AppChi2	N/A					95% KM (t) UCL	0.00792
2283				95% Gamma Approximate UCL		N/A					95% KM (% Bootstrap) UCL	0.012
2284				95% Adjusted Gamma UCL		N/A						
2285	**Note: DL/2 is not a recommended method.**											
2286												
2287												
2288	**Copper, dissolved (mw-34-80)**											
2289												
2290	**General Statistics**											
2291					Number of Valid Data	18					Number of Detected Data	4
2292					Number of Distinct Detected Data	4					Number of Non-Detect Data	14
2293											Percent Non-Detects	77.78%
2294												
2295	**Raw Statistics**						**Log-transformed Statistics**					
2296					Minimum Detected	0.0011					Minimum Detected	-6.812
2297					Maximum Detected	0.0106					Maximum Detected	-4.547
2298					Mean of Detected	0.00531					Mean of Detected	-5.595
2299					SD of Detected	0.00443					SD of Detected	1.046
2300					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
2301					Maximum Non-Detect	0.011					Maximum Non-Detect	-4.51
2302												
2303	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	18
2304	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
2305	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
2306												
2307	**Warning: There are only 4 Distinct Detected Values in this data**											
2308	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2309	**the resulting calculations may not be reliable enough tp draw conclusions**											
2310												
2311	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2312												
2313												
2314	**UCL Statistics**											
2315	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2316					Shapiro Wilk Test Statistic	0.922					Shapiro Wilk Test Statistic	0.937
2317					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
2318	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2319												
2320	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2321					DL/2 Substitution Method						DL/2 Substitution Method	
2322					Mean	0.00369					Mean	-5.984
2323					SD	0.00275					SD	1.024
2324					95% DL/2 (t) UCL	0.00482					95% H-Stat (DL/2) UCL	0.00796
2325												
2326					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2327	**MLE method failed to converge properly**										Mean in Log Scale	-7.171
2328											SD in Log Scale	1.226
2329											Mean in Original Scale	0.00171
2330											SD in Original Scale	0.00277
2331											95% Percentile Bootstrap UCL	0.00288
2332											95% BCA Bootstrap UCL	0.0032

2333												
2334	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2335					k star (bias corrected)	0.554	**Data appear Normal at 5% Significance Level**					
2336					Theta Star	0.00957						
2337					nu star	4.434						
2338												
2339					A-D Test Statistic	0.304	**Nonparametric Statistics**					
2340					5% A-D Critical Value	0.662	Kaplan-Meier (KM) Method					
2341					K-S Test Statistic	0.662	Mean	0.0024				
2342					5% K-S Critical Value	0.399	SD	0.00272				
2343	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0008595				
2344							95% KM (t) UCL	0.0039				
2345	**Assuming Gamma Distribution**						95% KM (z) UCL	0.00382				
2346					Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.00368				
2347					Minimum	0.0008297	95% KM (bootstrap t) UCL	0.00349				
2348					Maximum	0.0296	95% KM (BCA) UCL	0.0106				
2349					Mean	0.00933	95% KM (Percentile Bootstrap) UCL	0.00769				
2350					Median	0.00847	95% KM (Chebyshev) UCL	0.00615				
2351					SD	0.00777	97.5% KM (Chebyshev) UCL	0.00777				
2352					k star	1.16	99% KM (Chebyshev) UCL	0.011				
2353					Theta star	0.00805						
2354					Nu star	41.75	**Potential UCLs to Use**					
2355					AppChi2	27.94	95% KM (t) UCL	0.0039				
2356					95% Gamma Approximate UCL	0.0139	95% KM (Percentile Bootstrap) UCL	0.00769				
2357					95% Adjusted Gamma UCL	N/A						
2358	**Note: DL/2 is not a recommended method.**											
2359												
2360												
2361	**Copper, dissolved (mw-35-135)**											
2362												
2363	**General Statistics**											
2364					Number of Valid Data	2	Number of Detected Data	0				
2365					Number of Distinct Detected Data	0	Number of Non-Detect Data	2				
2366							Percent Non-Detects	100.00%				
2367												
2368	**Warning: This data set only has 2 observations!**											
2369	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2370	**The data set for variable Copper, dissolved (mw-35-135) was not processed!**											
2371												
2372	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2373	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2374												
2375												
2376												
2377	**Copper, dissolved (mw-35-60)**											
2378												
2379	**General Statistics**											
2380					Number of Valid Observations	1	Number of Distinct Observations	1				
2381												
2382												
2383	**Warning: This data set only has 1 observations!**											
2384	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2385	**The data set for variable Copper, dissolved (mw-35-60) was not processed!**											

	A	B	C	D	E	F	G	H	I	J	K	L
2386												
2387	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2388	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2389												
2390												
2391												
2392	**Copper, dissolved (mw-37d)**											
2393												
2394	**General Statistics**											
2395					Number of Valid Data	13			Number of Detected Data			2
2396					Number of Distinct Detected Data	2			Number of Non-Detect Data			11
2397									Percent Non-Detects			84.62%
2398												
2399	**Raw Statistics**						**Log-transformed Statistics**					
2400					Minimum Detected	0.00212			Minimum Detected			-6.156
2401					Maximum Detected	0.0096			Maximum Detected			-4.646
2402					Mean of Detected	0.00586			Mean of Detected			-5.401
2403					SD of Detected	0.00529			SD of Detected			1.068
2404					Minimum Non-Detect	0.001			Minimum Non-Detect			-6.908
2405					Maximum Non-Detect	0.0104			Maximum Non-Detect			-4.566
2406												
2407	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			13
2408	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			0
2409	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
2410												
2411	**Warning: Data set has only 2 Distinct Detected Values.**											
2412	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
2413	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2414												
2415	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
2416												
2417	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2418	**Those methods will return a 'N/A' value on your output display!**											
2419												
2420	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2421	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2422												
2423												
2424	**UCL Statistics**											
2425	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2426					Shapiro Wilk Test Statistic	1			Shapiro Wilk Test Statistic			1
2427					5% Shapiro Wilk Critical Value	N/A			5% Shapiro Wilk Critical Value			N/A
2428	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2429												
2430	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2431					DL/2 Substitution Method				DL/2 Substitution Method			
2432					Mean	0.00249			Mean			-6.534
2433					SD	0.00271			SD			1.102
2434					95% DL/2 (t) UCL	0.00383			95% H-Stat (DL/2) UCL			0.00579
2435												
2436					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
2437	**MLE method failed to converge properly**								Mean in Log Scale			N/A
2438									SD in Log Scale			N/A

2439											Mean in Original Scale	N/A
2440											SD in Original Scale	N/A
2441											95% Percentile Bootstrap UCL	N/A
2442											95% BCA Bootstrap UCL	N/A
2443												
2444				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
2445						k star (bias corrected)	N/A				**Data do not follow a Discernable Distribution (0.05)**	
2446						Theta Star	N/A					
2447						nu star	N/A					
2448												
2449						A-D Test Statistic	0.359				**Nonparametric Statistics**	
2450						5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method	
2451						K-S Test Statistic	N/A				Mean	0.0028
2452						5% K-S Critical Value	N/A				SD	0.00215
2453				**Data not Gamma Distributed at 5% Significance Level**							SE of Mean	0.0009169
2454											95% KM (t) UCL	0.00443
2455				**Assuming Gamma Distribution**							95% KM (z) UCL	0.00431
2456						Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.00785
2457						Minimum	N/A				95% KM (bootstrap t) UCL	0.00296
2458						Maximum	N/A				95% KM (BCA) UCL	0.0096
2459						Mean	N/A				95% KM (Percentile Bootstrap) UCL	0.0096
2460						Median	N/A				95% KM (Chebyshev) UCL	0.0068
2461						SD	N/A				97.5% KM (Chebyshev) UCL	0.00853
2462						k star	N/A				99% KM (Chebyshev) UCL	0.0119
2463						Theta star	N/A					
2464						Nu star	N/A				**Potential UCLs to Use**	
2465						AppChi2	N/A				95% KM (BCA) UCL	0.0096
2466						95% Gamma Approximate UCL	N/A					
2467						95% Adjusted Gamma UCL	N/A					
2468	**Note: DL/2 is not a recommended method.**											
2469												
2470												
2471	**Copper, dissolved (mw-37s)**											
2472												
2473							**General Statistics**					
2474						Number of Valid Data	1				Number of Detected Data	0
2475						Number of Distinct Detected Data	0				Number of Non-Detect Data	1
2476											Percent Non-Detects	100.00%
2477												
2478	**Warning: This data set only has 1 observations!**											
2479	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2480	**The data set for variable Copper, dissolved (mw-37s) was not processed!**											
2481												
2482	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2483	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2484												
2485												
2486												
2487	**Copper, dissolved (mw-38d)**											
2488												
2489							**General Statistics**					
2490						Number of Valid Data	1				Number of Detected Data	0
2491						Number of Distinct Detected Data	0				Number of Non-Detect Data	1

2492											Percent Non-Detects	100.00%
2493												
2494	Warning: This data set only has 1 observations!											
2495	Data set is too small to compute reliable and meaningful statistics and estimates!											
2496	The data set for variable Copper, dissolved (mw-38d) was not processed!											
2497												
2498	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2499	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2500												
2501												
2502												
2503	Copper, dissolved (mw-38s)											
2504												
2505	General Statistics											
2506						Number of Valid Data	1				Number of Detected Data	0
2507						Number of Distinct Detected Data	0				Number of Non-Detect Data	1
2508											Percent Non-Detects	100.00%
2509												
2510	Warning: This data set only has 1 observations!											
2511	Data set is too small to compute reliable and meaningful statistics and estimates!											
2512	The data set for variable Copper, dissolved (mw-38s) was not processed!											
2513												
2514	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2515	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2516												
2517												
2518												
2519	Copper, dissolved (mw-39-60)											
2520												
2521	General Statistics											
2522						Number of Valid Data	1				Number of Detected Data	0
2523						Number of Distinct Detected Data	0				Number of Non-Detect Data	1
2524											Percent Non-Detects	100.00%
2525												
2526	Warning: This data set only has 1 observations!											
2527	Data set is too small to compute reliable and meaningful statistics and estimates!											
2528	The data set for variable Copper, dissolved (mw-39-60) was not processed!											
2529												
2530	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2531	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2532												
2533												
2534												
2535	Copper, dissolved (mw-4)											
2536												
2537	General Statistics											
2538						Number of Valid Data	5				Number of Detected Data	4
2539						Number of Distinct Detected Data	4				Number of Non-Detect Data	1
2540											Percent Non-Detects	20.00%
2541												
2542	Raw Statistics										Log-transformed Statistics	
2543						Minimum Detected	0.00227				Minimum Detected	-6.088
2544						Maximum Detected	0.0045				Maximum Detected	-5.404

2545					Mean of Detected	0.00313					Mean of Detected	-5.799
2546					SD of Detected	0.0009623					SD of Detected	0.288
2547					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
2548					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
2549												
2550												
2551					**Warning: There are only 4 Distinct Detected Values in this data**							
2552					**Note: It should be noted that even though bootstrap may be performed on this data set**							
2553					**the resulting calculations may not be reliable enough tp draw conclusions**							
2554												
2555					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
2556												
2557												
2558					**UCL Statistics**							
2559					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
2560					Shapiro Wilk Test Statistic	0.892					Shapiro Wilk Test Statistic	0.943
2561					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
2562					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
2563												
2564					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2565					DL/2 Substitution Method						DL/2 Substitution Method	
2566					Mean	0.0035					Mean	-5.699
2567					SD	0.00118					SD	0.335
2568					95% DL/2 (t) UCL	0.00463					95% H-Stat (DL/2) UCL	0.0172
2569												
2570					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2571					**MLE method failed to converge properly**						Mean in Log Scale	-5.799
2572											SD in Log Scale	0.25
2573											Mean in Original Scale	0.00311
2574											SD in Original Scale	0.0008345
2575											95% Percentile Bootstrap UCL	0.0037
2576											95% BCA Bootstrap UCL	0.00386
2577												
2578					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
2579					k star (bias corrected)	4.052					**Data appear Normal at 5% Significance Level**	
2580					Theta Star	0.0007724						
2581					nu star	32.42						
2582												
2583					A-D Test Statistic	0.332					**Nonparametric Statistics**	
2584					5% A-D Critical Value	0.657					Kaplan-Meier (KM) Method	
2585					K-S Test Statistic	0.657					Mean	0.00313
2586					5% K-S Critical Value	0.395					SD	0.0008333
2587					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0004811
2588											95% KM (t) UCL	0.00416
2589					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00392
2590					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00419
2591					Minimum	0.00227					95% KM (bootstrap t) UCL	0.00528
2592					Maximum	0.0045					95% KM (BCA) UCL	0.00394
2593					Mean	0.00315					95% KM (Percentile Bootstrap) UCL	0.00392
2594					Median	0.003					95% KM (Chebyshev) UCL	0.00523
2595					SD	0.0008342					97.5% KM (Chebyshev) UCL	0.00613
2596					k star	7.87					99% KM (Chebyshev) UCL	0.00792
2597					Theta star	0.0003999						

2598					Nu star	78.7	**Potential UCLs to Use**					
2599					AppChi2	59.27				95% KM (t) UCL		0.00416
2600					95% Gamma Approximate UCL	0.00418				95% KM (Percentile Bootstrap) UCL		0.00392
2601					95% Adjusted Gamma UCL	N/A						
2602	**Note: DL/2 is not a recommended method.**											
2603												
2604												
2605	**Copper, dissolved (mw-40d)**											
2606												
2607	**General Statistics**											
2608					Number of Valid Observations	1				Number of Distinct Observations		1
2609												
2610												
2611	**Warning: This data set only has 1 observations!**											
2612	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2613	**The data set for variable Copper, dissolved (mw-40d) was not processed!**											
2614												
2615	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2616	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2617												
2618												
2619												
2620	**Copper, dissolved (mw-40s)**											
2621												
2622	**General Statistics**											
2623					Number of Valid Data	1				Number of Detected Data		0
2624					Number of Distinct Detected Data	0				Number of Non-Detect Data		1
2625										Percent Non-Detects		100.00%
2626												
2627	**Warning: This data set only has 1 observations!**											
2628	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2629	**The data set for variable Copper, dissolved (mw-40s) was not processed!**											
2630												
2631	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2632	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2633												
2634												
2635												
2636	**Copper, dissolved (mw-43-25)**											
2637												
2638	**General Statistics**											
2639					Number of Valid Data	3				Number of Detected Data		0
2640					Number of Distinct Detected Data	0				Number of Non-Detect Data		3
2641										Percent Non-Detects		100.00%
2642												
2643	**Warning: This data set only has 3 observations!**											
2644	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2645	**The data set for variable Copper, dissolved (mw-43-25) was not processed!**											
2646												
2647	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2648	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2649												
2650												

	A	B	C	D	E	F	G	H	I	J	K	L
2651												
2652	**Copper, dissolved (mw-44-115)**											
2653												
2654	**General Statistics**											
2655						Number of Valid Data	3			Number of Detected Data		0
2656						Number of Distinct Detected Data	0			Number of Non-Detect Data		3
2657										Percent Non-Detects		100.00%
2658												
2659	**Warning: This data set only has 3 observations!**											
2660	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2661	**The data set for variable Copper, dissolved (mw-44-115) was not processed!**											
2662												
2663	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2664	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2665												
2666												
2667												
2668	**Copper, dissolved (mw-44-125)**											
2669												
2670	**General Statistics**											
2671						Number of Valid Data	1			Number of Detected Data		0
2672						Number of Distinct Detected Data	0			Number of Non-Detect Data		1
2673										Percent Non-Detects		100.00%
2674												
2675	**Warning: This data set only has 1 observations!**											
2676	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2677	**The data set for variable Copper, dissolved (mw-44-125) was not processed!**											
2678												
2679	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2680	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2681												
2682												
2683												
2684	**Copper, dissolved (mw-45-095a)**											
2685												
2686	**General Statistics**											
2687						Number of Valid Observations	1			Number of Distinct Observations		1
2688												
2689												
2690	**Warning: This data set only has 1 observations!**											
2691	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2692	**The data set for variable Copper, dissolved (mw-45-095a) was not processed!**											
2693												
2694	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2695	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2696												
2697												
2698												
2699	**Copper, dissolved (mw-46-175)**											
2700												
2701	**General Statistics**											
2702						Number of Valid Data	1			Number of Detected Data		0
2703						Number of Distinct Detected Data	0			Number of Non-Detect Data		1

2704											Percent Non-Detects	100.00%
2705												
2706	Warning: This data set only has 1 observations!											
2707	Data set is too small to compute reliable and meaningful statistics and estimates!											
2708	The data set for variable Copper, dissolved (mw-46-175) was not processed!											
2709												
2710	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2711	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2712												
2713												
2714												
2715	Copper, dissolved (mw-47-55)											
2716												
2717	General Statistics											
2718						Number of Valid Data	1				Number of Detected Data	0
2719						Number of Distinct Detected Data	0				Number of Non-Detect Data	1
2720											Percent Non-Detects	100.00%
2721												
2722	Warning: This data set only has 1 observations!											
2723	Data set is too small to compute reliable and meaningful statistics and estimates!											
2724	The data set for variable Copper, dissolved (mw-47-55) was not processed!											
2725												
2726	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2727	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2728												
2729												
2730												
2731	Copper, dissolved (mw-48)											
2732												
2733	General Statistics											
2734						Number of Valid Data	3				Number of Detected Data	0
2735						Number of Distinct Detected Data	0				Number of Non-Detect Data	3
2736											Percent Non-Detects	100.00%
2737												
2738	Warning: This data set only has 3 observations!											
2739	Data set is too small to compute reliable and meaningful statistics and estimates!											
2740	The data set for variable Copper, dissolved (mw-48) was not processed!											
2741												
2742	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2743	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2744												
2745												
2746												
2747	Copper, dissolved (mw-5)											
2748												
2749	General Statistics											
2750						Number of Valid Data	5				Number of Detected Data	2
2751						Number of Distinct Detected Data	2				Number of Non-Detect Data	3
2752											Percent Non-Detects	60.00%
2753												
2754	Raw Statistics										Log-transformed Statistics	
2755						Minimum Detected	0.00204				Minimum Detected	-6.195
2756						Maximum Detected	0.00283				Maximum Detected	-5.867

2757				Mean of Detected	0.00244					Mean of Detected	-6.031	
2758				SD of Detected	0.0005586					SD of Detected	0.231	
2759				Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605	
2760				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
2761												
2762												
2763					**Warning: Data set has only 2 Distinct Detected Values.**							
2764					**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**							
2765					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
2766												
2767					**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**							
2768												
2769					**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**							
2770					**Those methods will return a 'N/A' value on your output display!**							
2771												
2772					**It is necessary to have 4 or more Distinct Values for bootstrap methods.**							
2773					**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**							
2774												
2775												
2776					**UCL Statistics**							
2777				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
2778				Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1	
2779				5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A	
2780				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
2781												
2782				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
2783				DL/2 Substitution Method						DL/2 Substitution Method		
2784				Mean	0.00397					Mean	-5.591	
2785				SD	0.00143					SD	0.418	
2786				95% DL/2 (t) UCL	0.00534					95% H-Stat (DL/2) UCL	0.113	
2787												
2788				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2789				**MLE method failed to converge properly**						Mean in Log Scale	N/A	
2790										SD in Log Scale	N/A	
2791										Mean in Original Scale	N/A	
2792										SD in Original Scale	N/A	
2793										95% Percentile Bootstrap UCL	N/A	
2794										95% BCA Bootstrap UCL	N/A	
2795												
2796				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
2797				k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**		
2798				Theta Star	N/A							
2799				nu star	N/A							
2800												
2801				A-D Test Statistic	0.359					**Nonparametric Statistics**		
2802				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
2803				K-S Test Statistic	N/A					Mean	0.00244	
2804				5% K-S Critical Value	N/A					SD	0.000395	
2805				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.000395	
2806										95% KM (t) UCL	0.00328	
2807				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00308	
2808				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	N/A	
2809				Minimum	N/A					95% KM (bootstrap t) UCL	N/A	

2810					Maximum	N/A					95% KM (BCA) UCL	N/A
2811					Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
2812					Median	N/A					95% KM (Chebyshev) UCL	0.00416
2813					SD	N/A					97.5% KM (Chebyshev) UCL	0.0049
2814					k star	N/A					99% KM (Chebyshev) UCL	0.00637
2815					Theta star	N/A						
2816					Nu star	N/A					**Potential UCLs to Use**	
2817					AppChi2	N/A					95% KM (t) UCL	0.00328
2818					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A
2819					95% Adjusted Gamma UCL	N/A						
2820	**Warning: Recommended UCL exceeds the maximum observation**											
2821	**Note: DL/2 is not a recommended method.**											
2822												
2823												
2824	**Copper, dissolved (mw-50-200)**											
2825												
2826	**General Statistics**											
2827					Number of Valid Data	3					Number of Detected Data	0
2828					Number of Distinct Detected Data	0					Number of Non-Detect Data	3
2829											Percent Non-Detects	100.00%
2830												
2831	**Warning: This data set only has 3 observations!**											
2832	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2833	**The data set for variable Copper, dissolved (mw-50-200) was not processed!**											
2834												
2835	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2836	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2837												
2838												
2839												
2840	**Copper, dissolved (mw-51)**											
2841												
2842	**General Statistics**											
2843					Number of Valid Data	3					Number of Detected Data	0
2844					Number of Distinct Detected Data	0					Number of Non-Detect Data	3
2845											Percent Non-Detects	100.00%
2846												
2847	**Warning: This data set only has 3 observations!**											
2848	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2849	**The data set for variable Copper, dissolved (mw-51) was not processed!**											
2850												
2851	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2852	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2853												
2854												
2855												
2856	**Copper, dissolved (mw-6)**											
2857												
2858	**General Statistics**											
2859					Number of Valid Data	5					Number of Detected Data	2
2860					Number of Distinct Detected Data	2					Number of Non-Detect Data	3
2861											Percent Non-Detects	60.00%
2862												

	A	B	C	D	E	F	G	H	I	J	K	L
2863	**Raw Statistics**						**Log-transformed Statistics**					
2864					Minimum Detected	0.00148					Minimum Detected	-6.516
2865					Maximum Detected	0.00189					Maximum Detected	-6.271
2866					Mean of Detected	0.00169					Mean of Detected	-6.393
2867					SD of Detected	0.0002899					SD of Detected	0.173
2868					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
2869					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
2870												
2871												
2872	**Warning: Data set has only 2 Distinct Detected Values.**											
2873	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
2874	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2875												
2876	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
2877												
2878	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2879	**Those methods will return a 'N/A' value on your output display!**											
2880												
2881	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2882	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2883												
2884												
2885	**UCL Statistics**											
2886	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2887					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
2888					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
2889	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2890												
2891	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2892					DL/2 Substitution Method						DL/2 Substitution Method	
2893					Mean	0.00367					Mean	-5.736
2894					SD	0.00182					SD	0.606
2895					95% DL/2 (t) UCL	0.00541					95% H-Stat (DL/2) UCL	0.34
2896												
2897					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2898	**MLE method failed to converge properly**										Mean in Log Scale	N/A
2899											SD in Log Scale	N/A
2900											Mean in Original Scale	N/A
2901											SD in Original Scale	N/A
2902											95% Percentile Bootstrap UCL	N/A
2903											95% BCA Bootstrap UCL	N/A
2904												
2905	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2906					k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**					
2907					Theta Star	N/A						
2908					nu star	N/A						
2909												
2910					A-D Test Statistic	0.359	**Nonparametric Statistics**					
2911					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
2912					K-S Test Statistic	N/A					Mean	0.00169
2913					5% K-S Critical Value	N/A					SD	0.000205
2914	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.000205
2915											95% KM (t) UCL	0.00212

	A	B	C	D	E	F	G	H	I	J	K	L
2916	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00202
2917					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	N/A
2918					Minimum	N/A					95% KM (bootstrap t) UCL	N/A
2919					Maximum	N/A					95% KM (BCA) UCL	N/A
2920					Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
2921					Median	N/A					95% KM (Chebyshev) UCL	0.00258
2922					SD	N/A					97.5% KM (Chebyshev) UCL	0.00297
2923					k star	N/A					99% KM (Chebyshev) UCL	0.00372
2924					Theta star	N/A						
2925					Nu star	N/A	**Potential UCLs to Use**					
2926					AppChi2	N/A					95% KM (t) UCL	0.00212
2927					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A
2928					95% Adjusted Gamma UCL	N/A						
2929	**Warning: Recommended UCL exceeds the maximum observation**											
2930	**Note: DL/2 is not a recommended method.**											
2931												
2932												
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3082												
3083												
3084												
3085												
3086	**Copper, dissolved (mw-9)**											
3087												
3088						**General Statistics**						
3089					Number of Valid Data	27				Number of Detected Data	17	
3090					Number of Distinct Detected Data	15				Number of Non-Detect Data	10	
3091										Percent Non-Detects	37.04%	
3092												
3093				**Raw Statistics**					**Log-transformed Statistics**			
3094					Minimum Detected	0.0024				Minimum Detected	-6.032	
3095					Maximum Detected	0.0167				Maximum Detected	-4.092	
3096					Mean of Detected	0.00672				Mean of Detected	-5.179	
3097					SD of Detected	0.00447				SD of Detected	0.59	
3098					Minimum Non-Detect	0.005				Minimum Non-Detect	-5.298	
3099					Maximum Non-Detect	0.0555				Maximum Non-Detect	-2.891	
3100												
3101	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	27	
3102	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
3103	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
3104												
3105						**UCL Statistics**						
3106				**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**			
3107					Shapiro Wilk Test Statistic	0.792				Shapiro Wilk Test Statistic	0.917	
3108					5% Shapiro Wilk Critical Value	0.892				5% Shapiro Wilk Critical Value	0.892	
3109				**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**			
3110												
3111				**Assuming Normal Distribution**					**Assuming Lognormal Distribution**			
3112					DL/2 Substitution Method					DL/2 Substitution Method		
3113					Mean	0.00702				Mean	-5.159	
3114					SD	0.00558				SD	0.594	
3115					95% DL/2 (t) UCL	0.00885				95% H-Stat (DL/2) UCL	0.00993	
3116												
3117					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
3118				**MLE method failed to converge properly**						Mean in Log Scale	-5.265	
3119										SD in Log Scale	0.507	
3120										Mean in Original Scale	0.00595	
3121										SD in Original Scale	0.00374	
3122										95% Percentile Bootstrap UCL	0.00726	
3123										95% BCA Bootstrap UCL	0.00737	
3124												
3125				**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**			
3126					k star (bias corrected)	2.506			**Data appear Lognormal at 5% Significance Level**			
3127					Theta Star	0.00268						

3128					nu star	85.22						
3129												
3130					A-D Test Statistic	0.909	**Nonparametric Statistics**					
3131					5% A-D Critical Value	0.745					Kaplan-Meier (KM) Method	
3132					K-S Test Statistic	0.745					Mean	0.00594
3133					5% K-S Critical Value	0.211					SD	0.00381
3134	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0008049
3135											95% KM (t) UCL	0.00731
3136	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00726
3137					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00731
3138					Minimum	0.0024					95% KM (bootstrap t) UCL	0.00782
3139					Maximum	0.0167					95% KM (BCA) UCL	0.00734
3140					Mean	0.00675					95% KM (Percentile Bootstrap) UCL	0.00726
3141					Median	0.00615					95% KM (Chebyshev) UCL	0.00945
3142					SD	0.00351					97.5% KM (Chebyshev) UCL	0.011
3143					k star	4.16					99% KM (Chebyshev) UCL	0.0139
3144					Theta star	0.00162						
3145					Nu star	224.6	**Potential UCLs to Use**					
3146					AppChi2	191					95% KM (BCA) UCL	0.00734
3147					95% Gamma Approximate UCL	0.00794						
3148					95% Adjusted Gamma UCL	0.00802						
3149	**Note: DL/2 is not a recommended method.**											
3150												
3151												
3152	**Copper, dissolved (ow-1d)**											
3153												
3154	**General Statistics**											
3155					Number of Valid Data	15	Number of Detected Data	3				
3156					Number of Distinct Detected Data	3	Number of Non-Detect Data	12				
3157							Percent Non-Detects	80.00%				
3158												
3159	**Raw Statistics**						**Log-transformed Statistics**					
3160					Minimum Detected	0.00252	Minimum Detected	-5.983				
3161					Maximum Detected	0.0216	Maximum Detected	-3.835				
3162					Mean of Detected	0.0135	Mean of Detected	-4.641				
3163					SD of Detected	0.00988	SD of Detected	1.17				
3164					Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908				
3165					Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605				
3166												
3167	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	13				
3168	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	2				
3169	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	86.67%				
3170												
3171	**Warning: There are only 3 Distinct Detected Values in this data set**											
3172	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3173	**Those methods will return a 'N/A' value on your output display!**											
3174												
3175	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
3176	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
3177												
3178												
3179	**UCL Statistics**											
3180	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					

3181					Shapiro Wilk Test Statistic	0.933					Shapiro Wilk Test Statistic	0.842
3182					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
3183					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
3184												
3185					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3186					DL/2 Substitution Method						DL/2 Substitution Method	
3187					Mean	0.00532					Mean	-5.747
3188					SD	0.00592					SD	1.107
3189					95% DL/2 (t) UCL	0.00801					95% H-Stat (DL/2) UCL	0.0153
3190												
3191					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3192					**MLE method failed to converge properly**						Mean in Log Scale	-7.359
3193											SD in Log Scale	1.824
3194											Mean in Original Scale	0.0032
3195											SD in Original Scale	0.00656
3196											95% Percentile Bootstrap UCL	0.00607
3197											95% BCA Bootstrap UCL	0.00722
3198												
3199					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
3200					k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**	
3201					Theta Star	N/A						
3202					nu star	N/A						
3203												
3204					A-D Test Statistic	0.438					**Nonparametric Statistics**	
3205					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
3206					K-S Test Statistic	N/A					Mean	0.00472
3207					5% K-S Critical Value	N/A					SD	0.0057
3208					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0018
3209											95% KM (t) UCL	0.0079
3210					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00769
3211					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0137
3212					Minimum	N/A					95% KM (bootstrap t) UCL	0.00591
3213					Maximum	N/A					95% KM (BCA) UCL	N/A
3214					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0216
3215					Median	N/A					95% KM (Chebyshev) UCL	0.0126
3216					SD	N/A					97.5% KM (Chebyshev) UCL	0.016
3217					k star	N/A					99% KM (Chebyshev) UCL	0.0226
3218					Theta star	N/A						
3219					Nu star	N/A					**Potential UCLs to Use**	
3220					AppChi2	N/A					95% KM (t) UCL	0.0079
3221					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0216
3222					95% Adjusted Gamma UCL	N/A						
3223	**Note: DL/2 is not a recommended method.**											
3224												
3225												
3226	**Copper, dissolved (ow-1m)**											
3227												
3228						**General Statistics**							
3229					Number of Valid Data	15					Number of Detected Data	2
3230					Number of Distinct Detected Data	2					Number of Non-Detect Data	13
3231											Percent Non-Detects	86.67%
3232												
3233					**Raw Statistics**						**Log-transformed Statistics**	

3234				Minimum Detected	0.00241					Minimum Detected	-6.028	
3235				Maximum Detected	0.021					Maximum Detected	-3.863	
3236				Mean of Detected	0.0117					Mean of Detected	-4.946	
3237				SD of Detected	0.0131					SD of Detected	1.531	
3238				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
3239				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
3240												
3241	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	14	
3242	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
3243	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	93.33%	
3244												
3245	**Warning: Data set has only 2 Distinct Detected Values.**											
3246	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
3247	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
3248												
3249	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
3250												
3251	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3252	**Those methods will return a 'N/A' value on your output display!**											
3253												
3254	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
3255	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
3256												
3257												
3258	**UCL Statistics**											
3259	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
3260				Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1	
3261				5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A	
3262	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**		
3263												
3264	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
3265				DL/2 Substitution Method						DL/2 Substitution Method		
3266				Mean	0.00463					Mean	-5.743	
3267				SD	0.00483					SD	0.932	
3268				95% DL/2 (t) UCL	0.00682					95% H-Stat (DL/2) UCL	0.0111	
3269												
3270				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3271	**MLE method failed to converge properly**									Mean in Log Scale	N/A	
3272										SD in Log Scale	N/A	
3273										Mean in Original Scale	N/A	
3274										SD in Original Scale	N/A	
3275										95% Percentile Bootstrap UCL	N/A	
3276										95% BCA Bootstrap UCL	N/A	
3277												
3278	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
3279				k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**		
3280				Theta Star	N/A							
3281				nu star	N/A							
3282												
3283				A-D Test Statistic	0.357					**Nonparametric Statistics**		
3284				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
3285				K-S Test Statistic	N/A					Mean	0.00365	
3286				5% K-S Critical Value	N/A					SD	0.00464	

3287	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.00169
3288											95% KM (t) UCL	0.00663
3289	Assuming Gamma Distribution										95% KM (z) UCL	0.00643
3290	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0162
3291	Minimum				N/A						95% KM (bootstrap t) UCL	1.8E+308
3292	Maximum				N/A						95% KM (BCA) UCL	0.021
3293	Mean				N/A						95% KM (Percentile Bootstrap) UCL	0.021
3294	Median				N/A						95% KM (Chebyshev) UCL	0.011
3295	SD				N/A						97.5% KM (Chebyshev) UCL	0.0142
3296	k star				N/A						99% KM (Chebyshev) UCL	0.0205
3297	Theta star				N/A							
3298	Nu star				N/A						Potential UCLs to Use	
3299	AppChi2				N/A						97.5% KM (Chebyshev) UCL	0.0142
3300	95% Gamma Approximate UCL				N/A							
3301	95% Adjusted Gamma UCL				N/A							
3302	Note: DL/2 is not a recommended method.											
3303												
3304												
3305	Copper, dissolved (ow-1s)											
3306												
3307	General Statistics											
3308	Number of Valid Data				13						Number of Detected Data	0
3309	Number of Distinct Detected Data				0						Number of Non-Detect Data	13
3310											Percent Non-Detects	100.00%
3311												
3312	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
3313	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
3314	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
3315												
3316	The data set for variable Copper, dissolved (ow-1s) was not processed!											
3317												
3318												
3319												
3320	Copper, dissolved (ow-2d)											
3321												
3322	General Statistics											
3323	Number of Valid Data				14						Number of Detected Data	4
3324	Number of Distinct Detected Data				4						Number of Non-Detect Data	10
3325											Percent Non-Detects	71.43%
3326												
3327	Raw Statistics										Log-transformed Statistics	
3328	Minimum Detected				0.00103						Minimum Detected	-6.878
3329	Maximum Detected				0.0186						Maximum Detected	-3.985
3330	Mean of Detected				0.00726						Mean of Detected	-5.426
3331	SD of Detected				0.00786						SD of Detected	1.216
3332	Minimum Non-Detect				0.001						Minimum Non-Detect	-6.908
3333	Maximum Non-Detect				0.01						Maximum Non-Detect	-4.605
3334												
3335	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
3336	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
3337	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	92.86%
3338												
3339	Warning: There are only 4 Distinct Detected Values in this data											

	A	B	C	D	E	F	G	H	I	J	K	L
3340	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3341	**the resulting calculations may not be reliable enough tp draw conclusions**											
3342												
3343	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3344												
3345												
3346	**UCL Statistics**											
3347	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3348	Shapiro Wilk Test Statistic					0.857	Shapiro Wilk Test Statistic					1.001
3349	5% Shapiro Wilk Critical Value					0.748	5% Shapiro Wilk Critical Value					0.748
3350	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3351												
3352	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3353	DL/2 Substitution Method						DL/2 Substitution Method					
3354	Mean					0.00497	Mean					-5.598
3355	SD					0.00429	SD					0.855
3356	95% DL/2 (t) UCL					0.007	95% H-Stat (DL/2) UCL					0.0119
3357												
3358	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
3359	**MLE method failed to converge properly**						Mean in Log Scale					-6.39
3360							SD in Log Scale					1.165
3361							Mean in Original Scale					0.00328
3362							SD in Original Scale					0.00479
3363							95% Percentile Bootstrap UCL					0.00555
3364							95% BCA Bootstrap UCL					0.00681
3365												
3366	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3367	k star (bias corrected)					0.451	**Data appear Normal at 5% Significance Level**					
3368	Theta Star					0.0161						
3369	nu star					3.607						
3370												
3371	A-D Test Statistic					0.221	**Nonparametric Statistics**					
3372	5% A-D Critical Value					0.665	Kaplan-Meier (KM) Method					
3373	K-S Test Statistic					0.665	Mean					0.00364
3374	5% K-S Critical Value					0.402	SD					0.00455
3375	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00157
3376							95% KM (t) UCL					0.00641
3377	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00621
3378	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00621
3379	Minimum					0.00103	95% KM (bootstrap t) UCL					0.0069
3380	Maximum					0.0186	95% KM (BCA) UCL					0.0186
3381	Mean					0.0069	95% KM (Percentile Bootstrap) UCL					0.00806
3382	Median					0.00671	95% KM (Chebyshev) UCL					0.0105
3383	SD					0.00401	97.5% KM (Chebyshev) UCL					0.0134
3384	k star					2.534	99% KM (Chebyshev) UCL					0.0192
3385	Theta star					0.00272						
3386	Nu star					70.95	**Potential UCLs to Use**					
3387	AppChi2					52.56	95% KM (t) UCL					0.00641
3388	95% Gamma Approximate UCL					0.00932	95% KM (Percentile Bootstrap) UCL					0.00806
3389	95% Adjusted Gamma UCL					N/A						
3390	**Note: DL/2 is not a recommended method.**											
3391												
3392												

	A	B	C	D	E	F	G	H	I	J	K	L
3393	**Copper, dissolved (ow-2m)**											
3394												
3395						**General Statistics**						
3396						Number of Valid Data	13			Number of Detected Data		1
3397						Number of Distinct Detected Data	1			Number of Non-Detect Data		12
3398										Percent Non-Detects		92.31%
3399												
3400					**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**							
3401					**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**							
3402												
3403					**The data set for variable Copper, dissolved (ow-2m) was not processed!**							
3404												
3405												
3406												
3407	**Copper, dissolved (ow-2s)**											
3408												
3409						**General Statistics**						
3410						Number of Valid Data	13			Number of Detected Data		0
3411						Number of Distinct Detected Data	0			Number of Non-Detect Data		13
3412										Percent Non-Detects		100.00%
3413												
3414					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
3415					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
3416					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
3417												
3418					**The data set for variable Copper, dissolved (ow-2s) was not processed!**							
3419												
3420												
3421												
3422	**Copper, dissolved (ow-3d)**											
3423												
3424						**General Statistics**						
3425						Number of Valid Data	2			Number of Detected Data		0
3426						Number of Distinct Detected Data	0			Number of Non-Detect Data		2
3427										Percent Non-Detects		100.00%
3428												
3429					**Warning: This data set only has 2 observations!**							
3430					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
3431					**The data set for variable Copper, dissolved (ow-3d) was not processed!**							
3432												
3433					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
3434					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
3435												
3436												
3437												
3438	**Copper, dissolved (ow-3m)**											
3439												
3440						**General Statistics**						
3441						Number of Valid Data	4			Number of Detected Data		1
3442						Number of Distinct Detected Data	1			Number of Non-Detect Data		3
3443										Percent Non-Detects		75.00%
3444												
3445					**Warning: This data set only has 4 observations!**							

	A	B	C	D	E	F	G	H	I	J	K	L
3446	Data set is too small to compute reliable and meaningful statistics and estimates!											
3447	The data set for variable Copper, dissolved (ow-3m) was not processed!											
3448												
3449	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3450	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3451												
3452												
3453												
3454	Copper, dissolved (ow-3s)											
3455												
3456	General Statistics											
3457						Number of Valid Data	3			Number of Detected Data	0	
3458						Number of Distinct Detected Data	0			Number of Non-Detect Data	3	
3459										Percent Non-Detects	100.00%	
3460												
3461	Warning: This data set only has 3 observations!											
3462	Data set is too small to compute reliable and meaningful statistics and estimates!											
3463	The data set for variable Copper, dissolved (ow-3s) was not processed!											
3464												
3465	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3466	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3467												
3468												
3469												
3470	Copper, dissolved (ow-5d)											
3471												
3472	General Statistics											
3473						Number of Valid Data	14			Number of Detected Data	4	
3474						Number of Distinct Detected Data	4			Number of Non-Detect Data	10	
3475										Percent Non-Detects	71.43%	
3476												
3477	Raw Statistics							Log-transformed Statistics				
3478						Minimum Detected	0.00294			Minimum Detected	-5.829	
3479						Maximum Detected	0.015			Maximum Detected	-4.2	
3480						Mean of Detected	0.00627			Mean of Detected	-5.331	
3481						SD of Detected	0.00584			SD of Detected	0.769	
3482						Minimum Non-Detect	0.005			Minimum Non-Detect	-5.298	
3483						Maximum Non-Detect	0.01			Maximum Non-Detect	-4.605	
3484												
3485	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	13	
3486	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
3487	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	92.86%	
3488												
3489	Warning: There are only 4 Distinct Detected Values in this data											
3490	Note: It should be noted that even though bootstrap may be performed on this data set											
3491	the resulting calculations may not be reliable enough tp draw conclusions											
3492												
3493	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
3494												
3495												
3496	UCL Statistics											
3497	Normal Distribution Test with Detected Values Only							Lognormal Distribution Test with Detected Values Only				
3498						Shapiro Wilk Test Statistic	0.699			Shapiro Wilk Test Statistic	0.772	

3499				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
3500	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3501												
3502	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3503				DL/2 Substitution Method						DL/2 Substitution Method		
3504				Mean	0.00483					Mean	-5.456	
3505				SD	0.00313					SD	0.47	
3506				95% DL/2 (t) UCL	0.00631					95% H-Stat (DL/2) UCL	0.00815	
3507												
3508				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3509	**MLE method failed to converge properly**									Mean in Log Scale	-5.565	
3510										SD in Log Scale	0.544	
3511										Mean in Original Scale	0.00451	
3512										SD in Original Scale	0.00333	
3513										95% Percentile Bootstrap UCL	0.00611	
3514										95% BCA Bootstrap UCL	0.00665	
3515												
3516	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3517				k star (bias corrected)	0.688		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
3518				Theta Star	0.00911							
3519				nu star	5.502							
3520												
3521				A-D Test Statistic	0.68		**Nonparametric Statistics**					
3522				5% A-D Critical Value	0.66					Kaplan-Meier (KM) Method		
3523				K-S Test Statistic	0.66					Mean	0.00419	
3524				5% K-S Critical Value	0.398					SD	0.00304	
3525	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean	0.0009798	
3526										95% KM (t) UCL	0.00592	
3527	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0058	
3528				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00582	
3529				Minimum	0.00117					95% KM (bootstrap t) UCL	0.0092	
3530				Maximum	0.015					95% KM (BCA) UCL	0.00643	
3531				Mean	0.00575					95% KM (Percentile Bootstrap) UCL	0.00643	
3532				Median	0.00513					95% KM (Chebyshev) UCL	0.00846	
3533				SD	0.00359					97.5% KM (Chebyshev) UCL	0.0103	
3534				k star	2.321					99% KM (Chebyshev) UCL	0.0139	
3535				Theta star	0.00248							
3536				Nu star	64.99		**Potential UCLs to Use**					
3537				AppChi2	47.44					95% KM (t) UCL	0.00592	
3538				95% Gamma Approximate UCL	0.00788							
3539				95% Adjusted Gamma UCL	N/A							
3540	**Note: DL/2 is not a recommended method.**											
3541												
3542												
3543	**Copper, dissolved (ow-5m)**											
3544												
3545	**General Statistics**											
3546				Number of Valid Data	14					Number of Detected Data	5	
3547				Number of Distinct Detected Data	5					Number of Non-Detect Data	9	
3548										Percent Non-Detects	64.29%	
3549												
3550	**Raw Statistics**						**Log-transformed Statistics**					
3551				Minimum Detected	0.0016					Minimum Detected	-6.438	

3552				Maximum Detected	0.0114					Maximum Detected	-4.474	
3553				Mean of Detected	0.00654					Mean of Detected	-5.264	
3554				SD of Detected	0.00434					SD of Detected	0.826	
3555				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
3556				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
3557												
3558	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	12	
3559	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	2	
3560	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	85.71%	
3561												
3562	**Warning: There are only 5 Detected Values in this data**											
3563	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3564	**the resulting calculations may not be reliable enough tp draw conclusions**											
3565												
3566	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3567												
3568												
3569	**UCL Statistics**											
3570	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
3571				Shapiro Wilk Test Statistic	0.906					Shapiro Wilk Test Statistic	0.922	
3572				5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762	
3573	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
3574												
3575	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
3576				DL/2 Substitution Method						DL/2 Substitution Method		
3577				Mean	0.00505					Mean	-5.5	
3578				SD	0.00296					SD	0.782	
3579				95% DL/2 (t) UCL	0.00645					95% H-Stat (DL/2) UCL	0.0109	
3580												
3581				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3582	**MLE method failed to converge properly**									Mean in Log Scale	-5.93	
3583										SD in Log Scale	0.86	
3584										Mean in Original Scale	0.00376	
3585										SD in Original Scale	0.00342	
3586										95% Percentile Bootstrap UCL	0.0053	
3587										95% BCA Bootstrap UCL	0.00554	
3588												
3589	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
3590				k star (bias corrected)	1.048					**Data appear Normal at 5% Significance Level**		
3591				Theta Star	0.00624							
3592				nu star	10.48							
3593												
3594				A-D Test Statistic	0.297					**Nonparametric Statistics**		
3595				5% A-D Critical Value	0.684					Kaplan-Meier (KM) Method		
3596				K-S Test Statistic	0.684					Mean	0.00405	
3597				5% K-S Critical Value	0.36					SD	0.00321	
3598	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00111	
3599										95% KM (t) UCL	0.00602	
3600	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00588	
3601				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.006	
3602				Minimum	0.0016					95% KM (bootstrap t) UCL	0.00583	
3603				Maximum	0.0114					95% KM (BCA) UCL	0.0107	
3604				Mean	0.00619					95% KM (Percentile Bootstrap) UCL	0.00694	

3605					Median	0.00564				95% KM (Chebyshev) UCL		0.0089
3606					SD	0.00328				97.5% KM (Chebyshev) UCL		0.011
3607					k star	2.696				99% KM (Chebyshev) UCL		0.0151
3608					Theta star	0.00229						
3609					Nu star	75.5				**Potential UCLs to Use**		
3610					AppChi2	56.49				95% KM (t) UCL		0.00602
3611				95% Gamma Approximate UCL		0.00827				95% KM (Percentile Bootstrap) UCL		0.00694
3612				95% Adjusted Gamma UCL		0.0086						
3613	**Note: DL/2 is not a recommended method.**											
3614												
3615												
3616	**Copper, dissolved (ow-5s)**											
3617												
3618	**General Statistics**											
3619					Number of Valid Data	14				Number of Detected Data		4
3620					Number of Distinct Detected Data	4				Number of Non-Detect Data		10
3621										Percent Non-Detects		71.43%
3622												
3623	**Raw Statistics**						**Log-transformed Statistics**					
3624					Minimum Detected	0.00114				Minimum Detected		-6.777
3625					Maximum Detected	0.015				Maximum Detected		-4.2
3626					Mean of Detected	0.00518				Mean of Detected		-5.786
3627					SD of Detected	0.00657				SD of Detected		1.107
3628					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
3629					Maximum Non-Detect	0.01				Maximum Non-Detect		-4.605
3630												
3631	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		13
3632	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
3633	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		92.86%
3634												
3635	**Warning: There are only 4 Distinct Detected Values in this data**											
3636	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3637	**the resulting calculations may not be reliable enough tp draw conclusions**											
3638												
3639	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3640												
3641												
3642	**UCL Statistics**											
3643	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3644					Shapiro Wilk Test Statistic	0.701				Shapiro Wilk Test Statistic		0.856
3645					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value		0.748
3646	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3647												
3648	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3649					DL/2 Substitution Method					DL/2 Substitution Method		
3650					Mean	0.00451				Mean		-5.586
3651					SD	0.00334				SD		0.614
3652					95% DL/2 (t) UCL	0.0061				95% H-Stat (DL/2) UCL		0.00793
3653												
3654					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
3655	**MLE method failed to converge properly**									Mean in Log Scale		-6.129
3656										SD in Log Scale		0.792
3657										Mean in Original Scale		0.00311

3658											SD in Original Scale	0.00363
3659											95% Percentile Bootstrap UCL	0.00481
3660											95% BCA Bootstrap UCL	0.00575
3661												
3662	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3663					k star (bias corrected)	0.44	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
3664					Theta Star	0.0118						
3665					nu star	3.522						
3666												
3667					A-D Test Statistic	0.601	**Nonparametric Statistics**					
3668					5% A-D Critical Value	0.666					Kaplan-Meier (KM) Method	
3669					K-S Test Statistic	0.666					Mean	0.00284
3670					5% K-S Critical Value	0.402					SD	0.00341
3671	**Data follow Appr. Gamma Distribution at 5% Significance Level**										SE of Mean	0.00109
3672											95% KM (t) UCL	0.00477
3673	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00463
3674					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00465
3675					Minimum	1E-09					95% KM (bootstrap t) UCL	0.00869
3676					Maximum	0.015					95% KM (BCA) UCL	0.00575
3677					Mean	0.00466					95% KM (Percentile Bootstrap) UCL	0.00502
3678					Median	0.0043					95% KM (Chebyshev) UCL	0.0076
3679					SD	0.00392					97.5% KM (Chebyshev) UCL	0.00966
3680					k star	0.436					99% KM (Chebyshev) UCL	0.0137
3681					Theta star	0.0107						
3682					Nu star	12.21	**Potential UCLs to Use**					
3683					AppChi2	5.368					95% KM (t) UCL	0.00477
3684					95% Gamma Approximate UCL	0.0106						
3685					95% Adjusted Gamma UCL	N/A						
3686	**Note: DL/2 is not a recommended method.**											
3687												
3688												
3689	**Copper, dissolved (park moabi-4)**											
3690												
3691	**General Statistics**											
3692					Number of Valid Observations	1					Number of Distinct Observations	1
3693												
3694												
3695	**Warning: This data set only has 1 observations!**											
3696	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3697	**The data set for variable Copper, dissolved (park moabi-4) was not processed!**											
3698												
3699	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3700	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3701												
3702												
3703												
3704	**Copper, dissolved (pge-6)**											
3705												
3706	**General Statistics**											
3707					Number of Valid Data	17					Number of Detected Data	10
3708					Number of Distinct Detected Data	9					Number of Non-Detect Data	7
3709											Percent Non-Detects	41.18%
3710												

	A	B	C	D	E	F	G	H	I	J	K	L
3711	**Raw Statistics**						**Log-transformed Statistics**					
3712					Minimum Detected	0.0034					Minimum Detected	-5.684
3713					Maximum Detected	0.047					Maximum Detected	-3.058
3714					Mean of Detected	0.0126					Mean of Detected	-4.771
3715					SD of Detected	0.0137					SD of Detected	0.872
3716					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
3717					Maximum Non-Detect	0.011					Maximum Non-Detect	-4.51
3718												
3719	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	14
3720	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	3
3721	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	82.35%
3722												
3723	**UCL Statistics**											
3724	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3725					Shapiro Wilk Test Statistic	0.704					Shapiro Wilk Test Statistic	0.878
3726					5% Shapiro Wilk Critical Value	0.842					5% Shapiro Wilk Critical Value	0.842
3727	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3728												
3729	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3730					DL/2 Substitution Method						DL/2 Substitution Method	
3731					Mean	0.00949					Mean	-4.983
3732					SD	0.011					SD	0.705
3733					95% DL/2 (t) UCL	0.0141					95% H-Stat (DL/2) UCL	0.0135
3734												
3735					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3736	**MLE yields a negative mean**										Mean in Log Scale	-4.943
3737											SD in Log Scale	0.751
3738											Mean in Original Scale	0.00994
3739											SD in Original Scale	0.0109
3740											95% Percentile Bootstrap UCL	0.0147
3741											95% BCA Bootstrap UCL	0.0165
3742												
3743	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3744					k star (bias corrected)	1.052	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
3745					Theta Star	0.012						
3746					nu star	21.04						
3747												
3748					A-D Test Statistic	0.801	**Nonparametric Statistics**					
3749					5% A-D Critical Value	0.741					Kaplan-Meier (KM) Method	
3750					K-S Test Statistic	0.741					Mean	0.00962
3751					5% K-S Critical Value	0.272					SD	0.0107
3752	**Data follow Appr. Gamma Distribution at 5% Significance Level**										SE of Mean	0.00275
3753											95% KM (t) UCL	0.0144
3754	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0141
3755					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0143
3756					Minimum	0.0034					95% KM (bootstrap t) UCL	0.0204
3757					Maximum	0.047					95% KM (BCA) UCL	0.0143
3758					Mean	0.0124					95% KM (Percentile Bootstrap) UCL	0.0143
3759					Median	0.0107					95% KM (Chebyshev) UCL	0.0216
3760					SD	0.0103					97.5% KM (Chebyshev) UCL	0.0268
3761					k star	1.909					99% KM (Chebyshev) UCL	0.037
3762					Theta star	0.0065						
3763					Nu star	64.9	**Potential UCLs to Use**					

3764					AppChi2	47.37					95% KM (t) UCL	0.0144
3765					95% Gamma Approximate UCL	0.017						
3766					95% Adjusted Gamma UCL	0.0176						
3767	**Note: DL/2 is not a recommended method.**											
3768												
3769												
3770	**Copper, dissolved (pge-7)**											
3771												
3772	**General Statistics**											
3773					Number of Valid Data	15					Number of Detected Data	4
3774					Number of Distinct Detected Data	4					Number of Non-Detect Data	11
3775											Percent Non-Detects	73.33%
3776												
3777	**Raw Statistics**						**Log-transformed Statistics**					
3778					Minimum Detected	0.0026					Minimum Detected	-5.952
3779					Maximum Detected	0.0192					Maximum Detected	-3.953
3780					Mean of Detected	0.00803					Mean of Detected	-5.118
3781					SD of Detected	0.00758					SD of Detected	0.849
3782					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
3783					Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
3784												
3785	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
3786	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
3787	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
3788												
3789	**Warning: There are only 4 Distinct Detected Values in this data**											
3790	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3791	**the resulting calculations may not be reliable enough tp draw conclusions**											
3792												
3793	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3794												
3795												
3796	**UCL Statistics**											
3797	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3798					Shapiro Wilk Test Statistic	0.794					Shapiro Wilk Test Statistic	0.945
3799					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
3800	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3801												
3802	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3803					DL/2 Substitution Method						DL/2 Substitution Method	
3804					Mean	0.0188					Mean	-5.004
3805					SD	0.0503					SD	1.021
3806					95% DL/2 (t) UCL	0.0417					95% H-Stat (DL/2) UCL	0.026
3807												
3808					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3809	**MLE method failed to converge properly**										Mean in Log Scale	-5.395
3810											SD in Log Scale	0.639
3811											Mean in Original Scale	0.00559
3812											SD in Original Scale	0.00438
3813											95% Percentile Bootstrap UCL	0.00751
3814											95% BCA Bootstrap UCL	0.0086
3815												
3816	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					

3817				k star (bias corrected)	0.632	**Data appear Normal at 5% Significance Level**						
3818				Theta Star	0.0127							
3819				nu star	5.052							
3820												
3821				A-D Test Statistic	0.382	**Nonparametric Statistics**						
3822				5% A-D Critical Value	0.661	Kaplan-Meier (KM) Method						
3823				K-S Test Statistic	0.661	Mean	0.00536					
3824				5% K-S Critical Value	0.398	SD	0.00406					
3825	**Data appear Gamma Distributed at 5% Significance Level**					SE of Mean	0.00146					
3826						95% KM (t) UCL	0.00794					
3827	**Assuming Gamma Distribution**					95% KM (z) UCL	0.00777					
3828	Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.00803					
3829				Minimum	0.0004668	95% KM (bootstrap t) UCL	0.00912					
3830				Maximum	0.0192	95% KM (BCA) UCL	0.00774					
3831				Mean	0.00707	95% KM (Percentile Bootstrap) UCL	0.00861					
3832				Median	0.00664	95% KM (Chebyshev) UCL	0.0117					
3833				SD	0.00464	97.5% KM (Chebyshev) UCL	0.0145					
3834				k star	1.664	99% KM (Chebyshev) UCL	0.0199					
3835				Theta star	0.00425							
3836				Nu star	49.91	**Potential UCLs to Use**						
3837				AppChi2	34.69	95% KM (t) UCL	0.00794					
3838				95% Gamma Approximate UCL	0.0102	95% KM (Percentile Bootstrap) UCL	0.00861					
3839				95% Adjusted Gamma UCL	N/A							
3840	**Note: DL/2 is not a recommended method.**											
3841												
3842												
3843	**Copper, dissolved (pge-8)**											
3844												
3845	**General Statistics**											
3846				Number of Valid Data	17	Number of Detected Data	7					
3847				Number of Distinct Detected Data	6	Number of Non-Detect Data	10					
3848						Percent Non-Detects	58.82%					
3849												
3850	**Raw Statistics**					**Log-transformed Statistics**						
3851				Minimum Detected	0.0028	Minimum Detected	-5.878					
3852				Maximum Detected	0.0053	Maximum Detected	-5.24					
3853				Mean of Detected	0.00379	Mean of Detected	-5.607					
3854				SD of Detected	0.00105	SD of Detected	0.263					
3855				Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605					
3856				Maximum Non-Detect	0.4	Maximum Non-Detect	-0.916					
3857												
3858	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect	17					
3859	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected	0					
3860	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage	100.00%					
3861												
3862	**Warning: There are only 7 Detected Values in this data**											
3863	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3864	**the resulting calculations may not be reliable enough tp draw conclusions**											
3865												
3866	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3867												
3868												
3869	**UCL Statistics**											

	A	B	C	D	E	F	G	H	I	J	K	L
3870	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3871					Shapiro Wilk Test Statistic	0.821					Shapiro Wilk Test Statistic	0.856
3872					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
3873	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3874												
3875	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3876					DL/2 Substitution Method						DL/2 Substitution Method	
3877					Mean	0.016					Mean	-5.209
3878					SD	0.0474					SD	0.954
3879					95% DL/2 (t) UCL	0.0361					95% H-Stat (DL/2) UCL	0.032
3880												
3881					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3882	**MLE method failed to converge properly**										Mean in Log Scale	-5.607
3883											SD in Log Scale	0.242
3884											Mean in Original Scale	0.00378
3885											SD in Original Scale	0.0009383
3886											95% Percentile Bootstrap UCL	0.00415
3887											95% BCA Bootstrap UCL	0.00419
3888												
3889	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3890					k star (bias corrected)	9.506	**Data appear Normal at 5% Significance Level**					
3891					Theta Star	0.0003983						
3892					nu star	133.1						
3893												
3894					A-D Test Statistic	0.577	**Nonparametric Statistics**					
3895					5% A-D Critical Value	0.707					Kaplan-Meier (KM) Method	
3896					K-S Test Statistic	0.707					Mean	0.00379
3897					5% K-S Critical Value	0.312					SD	0.0009702
3898	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0003961
3899											95% KM (t) UCL	0.00448
3900	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00444
3901					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00451
3902					Minimum	0.00206					95% KM (bootstrap t) UCL	0.00543
3903					Maximum	0.0053					95% KM (BCA) UCL	0.00442
3904					Mean	0.00379					95% KM (Percentile Bootstrap) UCL	0.00446
3905					Median	0.00364					95% KM (Chebyshev) UCL	0.00551
3906					SD	0.0009222					97.5% KM (Chebyshev) UCL	0.00626
3907					k star	14.03					99% KM (Chebyshev) UCL	0.00773
3908					Theta star	0.0002698						
3909					Nu star	477.1	**Potential UCLs to Use**					
3910					AppChi2	427.5					95% KM (t) UCL	0.00448
3911					95% Gamma Approximate UCL	0.00423					95% KM (Percentile Bootstrap) UCL	0.00446
3912					95% Adjusted Gamma UCL	0.00428						
3913	**Note: DL/2 is not a recommended method.**											
3914												
3915												
3916	**Copper, dissolved (tw-1)**											
3917												
3918	**General Statistics**											
3919					Number of Valid Data	4					Number of Detected Data	0
3920					Number of Distinct Detected Data	0					Number of Non-Detect Data	4
3921											Percent Non-Detects	100.00%
3922												

	A	B	C	D	E	F	G	H	I	J	K	L
3923	**Warning: This data set only has 4 observations!**											
3924	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3925	**The data set for variable Copper, dissolved (tw-1) was not processed!**											
3926												
3927	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3928	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3929												
3930												
3931												
3932	**Copper, dissolved (tw-2d)**											
3933												
3934	**General Statistics**											
3935						Number of Valid Data	3			Number of Detected Data	0	
3936						Number of Distinct Detected Data	0			Number of Non-Detect Data	3	
3937										Percent Non-Detects	100.00%	
3938												
3939	**Warning: This data set only has 3 observations!**											
3940	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3941	**The data set for variable Copper, dissolved (tw-2d) was not processed!**											
3942												
3943	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3944	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3945												
3946												
3947												
3948	**Copper, dissolved (tw-2s)**											
3949												
3950	**General Statistics**											
3951						Number of Valid Data	3			Number of Detected Data	1	
3952						Number of Distinct Detected Data	1			Number of Non-Detect Data	2	
3953										Percent Non-Detects	66.67%	
3954												
3955	**Warning: This data set only has 3 observations!**											
3956	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3957	**The data set for variable Copper, dissolved (tw-2s) was not processed!**											
3958												
3959	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3960	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3961												
3962												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Fluoride (1)

General Statistics

Number of Valid Data	143	Number of Detected Data	118
Number of Distinct Detected Data	108	Number of Non-Detect Data	25
		Percent Non-Detects	17.48%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.525	Minimum Detected	-0.644
Maximum Detected	4.34	Maximum Detected	1.468
Mean of Detected	1.698	Mean of Detected	0.362
SD of Detected	1.024	SD of Detected	0.577
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.126	Lilliefors Test Statistic	0.118
5% Lilliefors Critical Value	0.0816	5% Lilliefors Critical Value	0.0816
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.445	Mean	0.0562
SD	1.081	SD	0.848
95% DL/2 (t) UCL	1.594	95% H-Stat (DL/2) UCL	1.452
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.365	Mean in Log Scale	0.133
SD	1.199	SD in Log Scale	0.734
95% MLE (t) UCL	1.532	Mean in Original Scale	1.471
95% MLE (Tiku) UCL	1.532	SD in Original Scale	1.054
		95% Percentile Bootstrap UCL	1.619
		95% BCA Bootstrap UCL	1.626

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	3.07	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.553		
nu star	724.5		
A-D Test Statistic	2.267	**Nonparametric Statistics**	
5% A-D Critical Value	0.759	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.759	Mean	1.493
5% K-S Critical Value	0.0853	SD	1.028

54	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.0863
55											95% KM (t) UCL	1.636
56	Assuming Gamma Distribution										95% KM (z) UCL	1.635
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	1.632
58	Minimum	1E-09									95% KM (bootstrap t) UCL	1.647
59	Maximum	4.34									95% KM (BCA) UCL	1.636
60	Mean	1.477									95% KM (Percentile Bootstrap) UCL	1.639
61	Median	1.14									95% KM (Chebyshev) UCL	1.869
62	SD	1.056									97.5% KM (Chebyshev) UCL	2.032
63	k star	0.579									99% KM (Chebyshev) UCL	2.352
64	Theta star	2.55										
65	Nu star	165.7									Potential UCLs to Use	
66	AppChi2	137									95% KM (BCA) UCL	1.636
67	95% Gamma Approximate UCL	1.788										
68	95% Adjusted Gamma UCL	1.791										
69	Note: DL/2 is not a recommended method.											
70												
71												
72	Fluoride (cw-1d)											
73												
74	General Statistics											
75	Number of Valid Data	8									Number of Detected Data	7
76	Number of Distinct Detected Data	7									Number of Non-Detect Data	1
77											Percent Non-Detects	12.50%
78												
79	Raw Statistics										Log-transformed Statistics	
80	Minimum Detected	0.951									Minimum Detected	-0.0502
81	Maximum Detected	4.98									Maximum Detected	1.605
82	Mean of Detected	3.054									Mean of Detected	0.987
83	SD of Detected	1.45									SD of Detected	0.598
84	Minimum Non-Detect	5									Minimum Non-Detect	1.609
85	Maximum Non-Detect	5									Maximum Non-Detect	1.609
86												
87												
88	Warning: There are only 7 Detected Values in this data											
89	Note: It should be noted that even though bootstrap may be performed on this data set											
90	the resulting calculations may not be reliable enough tp draw conclusions											
91												
92	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
93												
94												
95	UCL Statistics											
96	Normal Distribution Test with Detected Values Only										Lognormal Distribution Test with Detected Values Only	
97	Shapiro Wilk Test Statistic	0.951									Shapiro Wilk Test Statistic	0.889
98	5% Shapiro Wilk Critical Value	0.803									5% Shapiro Wilk Critical Value	0.803
99	Data appear Normal at 5% Significance Level										Data appear Lognormal at 5% Significance Level	
100												
101	Assuming Normal Distribution										Assuming Lognormal Distribution	
102	DL/2 Substitution Method										DL/2 Substitution Method	
103	Mean	2.985									Mean	0.978
104	SD	1.357									SD	0.554
105	95% DL/2 (t) UCL	3.894									95% H-Stat (DL/2) UCL	8.874
106												

107	Maximum Likelihood Estimate(MLE) Method				N/A					Log ROS Method		
108	**MLE method failed to converge properly**									Mean in Log Scale		0.987
109										SD in Log Scale		0.553
110										Mean in Original Scale		3.008
111										SD in Original Scale		1.349
112										95% Percentile Bootstrap UCL		3.767
113										95% BCA Bootstrap UCL		3.739
114												
115	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
116	k star (bias corrected)				2.385					**Data appear Normal at 5% Significance Level**		
117	Theta Star				1.28							
118	nu star				33.4							
119												
120	A-D Test Statistic				0.377					**Nonparametric Statistics**		
121	5% A-D Critical Value				0.71					Kaplan-Meier (KM) Method		
122	K-S Test Statistic				0.71					Mean		3.054
123	5% K-S Critical Value				0.313					SD		1.343
124	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.548
125										95% KM (t) UCL		4.093
126	**Assuming Gamma Distribution**									95% KM (z) UCL		3.956
127	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL		4.104
128	Minimum				0.951					95% KM (bootstrap t) UCL		4.044
129	Maximum				4.98					95% KM (BCA) UCL		3.912
130	Mean				3.073					95% KM (Percentile Bootstrap) UCL		3.88
131	Median				3.238					95% KM (Chebyshev) UCL		5.444
132	SD				1.344					97.5% KM (Chebyshev) UCL		6.478
133	k star				2.929					99% KM (Chebyshev) UCL		8.509
134	Theta star				1.049							
135	Nu star				46.87					**Potential UCLs to Use**		
136	AppChi2				32.16					95% KM (t) UCL		4.093
137	95% Gamma Approximate UCL				4.479					95% KM (Percentile Bootstrap) UCL		3.88
138	95% Adjusted Gamma UCL				4.949							
139	**Note: DL/2 is not a recommended method.**											
140												
141												
142	**Fluoride (cw-1m)**											
143												
144	**General Statistics**											
145	Number of Valid Observations				8					Number of Distinct Observations		8
146												
147	**Raw Statistics**									**Log-transformed Statistics**		
148	Minimum				2.34					Minimum of Log Data		0.85
149	Maximum				3.78					Maximum of Log Data		1.33
150	Mean				2.935					Mean of log Data		1.065
151	Median				2.81					SD of log Data		0.166
152	SD				0.496							
153	Coefficient of Variation				0.169							
154	Skewness				0.567							
155												
156												
157	**Warning: There are only 8 Values in this data**											
158	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
159	**the resulting calculations may not be reliable enough to draw conclusions**											

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.		
Relevant UCL Statistics		
Normal Distribution Test		**Lognormal Distribution Test**
Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Test Statistic 0.96
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value 0.818
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**
Assuming Normal Distribution		**Assuming Lognormal Distribution**
95% Student's-t UCL	3.267	95% H-UCL 3.313
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL 3.685
95% Adjusted-CLT UCL	3.261	97.5% Chebyshev (MVUE) UCL 4.01
95% Modified-t UCL	3.273	99% Chebyshev (MVUE) UCL 4.648
Gamma Distribution Test		**Data Distribution**
k star (bias corrected)	25.88	**Data appear Normal at 5% Significance Level**
Theta Star	0.113	
nu star	414.1	
Approximate Chi Square Value (.05)	367.9	**Nonparametric Statistics**
Adjusted Level of Significance	0.0195	95% CLT UCL 3.223
Adjusted Chi Square Value	356.9	95% Jackknife UCL 3.267
		95% Standard Bootstrap UCL 3.206
Anderson-Darling Test Statistic	0.242	95% Bootstrap-t UCL 3.338
Anderson-Darling 5% Critical Value	0.715	95% Hall's Bootstrap UCL 3.268
Kolmogorov-Smirnov Test Statistic	0.167	95% Percentile Bootstrap UCL 3.223
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL 3.225
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 3.699
		97.5% Chebyshev(Mean, Sd) UCL 4.029
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 4.678
95% Approximate Gamma UCL	3.303	
95% Adjusted Gamma UCL	3.406	
Potential UCL to Use		Use 95% Student's-t UCL 3.267

Fluoride (cw-2d)

General Statistics			
Number of Valid Data	8	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	1
		Percent Non-Detects	12.50%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.982	Minimum Detected	-0.0182
Maximum Detected	7.26	Maximum Detected	1.982
Mean of Detected	3.025	Mean of Detected	0.893
SD of Detected	2.165	SD of Detected	0.711
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5	Maximum Non-Detect	1.609

Warning: There are only 7 Detected Values in this data

213	Note: It should be noted that even though bootstrap may be performed on this data set											
214	the resulting calculations may not be reliable enough tp draw conclusions											
215												
216	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
217												
218												
219	UCL Statistics											
220	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
221	Shapiro Wilk Test Statistic				0.848		Shapiro Wilk Test Statistic					0.926
222	5% Shapiro Wilk Critical Value				0.803		5% Shapiro Wilk Critical Value					0.803
223	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
224												
225	Assuming Normal Distribution						Assuming Lognormal Distribution					
226	DL/2 Substitution Method						DL/2 Substitution Method					
227	Mean				2.959		Mean					0.896
228	SD				2.013		SD					0.659
229	95% DL/2 (t) UCL				4.307		95% H-Stat (DL/2) UCL					9.942
230												
231	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
232	MLE method failed to converge properly						Mean in Log Scale					0.873
233							SD in Log Scale					0.661
234							Mean in Original Scale					2.906
235							SD in Original Scale					2.033
236							95% Percentile Bootstrap UCL					4.073
237							95% BCA Bootstrap UCL					4.418
238												
239	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
240	k star (bias corrected)				1.52		Data appear Normal at 5% Significance Level					
241	Theta Star				1.989							
242	nu star				21.29							
243												
244	A-D Test Statistic				0.391		Nonparametric Statistics					
245	5% A-D Critical Value				0.714		Kaplan-Meier (KM) Method					
246	K-S Test Statistic				0.714		Mean					2.936
247	5% K-S Critical Value				0.314		SD					1.929
248	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.754
249							95% KM (t) UCL					4.364
250	Assuming Gamma Distribution						95% KM (z) UCL					4.176
251	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					4.362
252	Minimum				0.982		95% KM (bootstrap t) UCL					5.023
253	Maximum				7.26		95% KM (BCA) UCL					4.106
254	Mean				3.032		95% KM (Percentile Bootstrap) UCL					4.093
255	Median				3.172		95% KM (Chebyshev) UCL					6.222
256	SD				2.005		97.5% KM (Chebyshev) UCL					7.643
257	k star				1.852		99% KM (Chebyshev) UCL					10.44
258	Theta star				1.637							
259	Nu star				29.63		Potential UCLs to Use					
260	AppChi2				18.2		95% KM (t) UCL					4.364
261	95% Gamma Approximate UCL				4.935		95% KM (Percentile Bootstrap) UCL					4.093
262	95% Adjusted Gamma UCL				5.622							
263	Note: DL/2 is not a recommended method.											
264												
265												

266	Fluoride (cw-2m)											
267												
268	General Statistics											
269					Number of Valid Data	8			Number of Detected Data	7		
270					Number of Distinct Detected Data	7			Number of Non-Detect Data	1		
271									Percent Non-Detects	12.50%		
272												
273	Raw Statistics						Log-transformed Statistics					
274					Minimum Detected	2.3			Minimum Detected	0.833		
275					Maximum Detected	3.64			Maximum Detected	1.292		
276					Mean of Detected	2.959			Mean of Detected	1.075		
277					SD of Detected	0.443			SD of Detected	0.153		
278					Minimum Non-Detect	5			Minimum Non-Detect	1.609		
279					Maximum Non-Detect	5			Maximum Non-Detect	1.609		
280												
281												
282	Warning: There are only 7 Detected Values in this data											
283	Note: It should be noted that even though bootstrap may be performed on this data set											
284	the resulting calculations may not be reliable enough tp draw conclusions											
285												
286	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
287												
288												
289	UCL Statistics											
290	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
291					Shapiro Wilk Test Statistic	0.967			Shapiro Wilk Test Statistic	0.961		
292					5% Shapiro Wilk Critical Value	0.803			5% Shapiro Wilk Critical Value	0.803		
293	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
294												
295	Assuming Normal Distribution						Assuming Lognormal Distribution					
296					DL/2 Substitution Method				DL/2 Substitution Method			
297					Mean	2.901			Mean	1.055		
298					SD	0.441			SD	0.152		
299					95% DL/2 (t) UCL	3.197			95% H-Stat (DL/2) UCL	4.47		
300												
301					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
302	MLE method failed to converge properly								Mean in Log Scale	1.075		
303									SD in Log Scale	0.142		
304									Mean in Original Scale	2.955		
305									SD in Original Scale	0.411		
306									95% Percentile Bootstrap UCL	3.184		
307									95% BCA Bootstrap UCL	3.19		
308												
309	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
310					k star (bias corrected)	29.13	Data appear Normal at 5% Significance Level					
311					Theta Star	0.102						
312					nu star	407.9						
313												
314					A-D Test Statistic	0.259	Nonparametric Statistics					
315					5% A-D Critical Value	0.708			Kaplan-Meier (KM) Method			
316					K-S Test Statistic	0.708			Mean	2.959		
317					5% K-S Critical Value	0.311			SD	0.41		
318	Data appear Gamma Distributed at 5% Significance Level								SE of Mean	0.168		

319											95% KM (t) UCL	3.276
320	**Assuming Gamma Distribution**										95% KM (z) UCL	3.234
321				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	3.279
322					Minimum	2.3					95% KM (bootstrap t) UCL	3.28
323					Maximum	3.64					95% KM (BCA) UCL	3.196
324					Mean	2.968					95% KM (Percentile Bootstrap) UCL	3.215
325					Median	3.063					95% KM (Chebyshev) UCL	3.689
326					SD	0.411					97.5% KM (Chebyshev) UCL	4.005
327					k star	36.21					99% KM (Chebyshev) UCL	4.626
328					Theta star	0.082						
329					Nu star	579.4					**Potential UCLs to Use**	
330					AppChi2	524.5					95% KM (t) UCL	3.276
331				95% Gamma Approximate UCL		3.279					95% KM (Percentile Bootstrap) UCL	3.215
332				95% Adjusted Gamma UCL		3.364						
333	**Note: DL/2 is not a recommended method.**											
334												
335												
336	**Fluoride (cw-3d)**											
337												
338	**General Statistics**											
339				Number of Valid Data		8					Number of Detected Data	6
340				Number of Distinct Detected Data		6					Number of Non-Detect Data	2
341											Percent Non-Detects	25.00%
342												
343	**Raw Statistics**										**Log-transformed Statistics**	
344					Minimum Detected	1.4					Minimum Detected	0.336
345					Maximum Detected	5.84					Maximum Detected	1.765
346					Mean of Detected	3.245					Mean of Detected	1.052
347					SD of Detected	1.785					SD of Detected	0.549
348					Minimum Non-Detect	0.5					Minimum Non-Detect	-0.693
349					Maximum Non-Detect	5					Maximum Non-Detect	1.609
350												
351	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	6
352	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
353	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	75.00%
354												
355	**Warning: There are only 6 Detected Values in this data**											
356	**Note: It should be noted that even though bootstrap may be performed on this data set**											
357	**the resulting calculations may not be reliable enough tp draw conclusions**											
358												
359	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
360												
361												
362	**UCL Statistics**											
363	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
364					Shapiro Wilk Test Statistic	0.881					Shapiro Wilk Test Statistic	0.939
365					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
366	**Data appear Normal at 5% Significance Level**										**Data appear Lognormal at 5% Significance Level**	
367												
368	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
369					DL/2 Substitution Method						DL/2 Substitution Method	
370					Mean	2.778					Mean	0.73
371					SD	1.84					SD	0.974

372				95% DL/2 (t) UCL	4.01					95% H-Stat (DL/2) UCL	15.21	
373												
374				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
375				**MLE method failed to converge properly**						Mean in Log Scale	0.839	
376										SD in Log Scale	0.645	
377										Mean in Original Scale	2.765	
378										SD in Original Scale	1.771	
379										95% Percentile Bootstrap UCL	3.745	
380										95% BCA Bootstrap UCL	3.993	
381												
382				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
383				k star (bias corrected)	2.182					**Data appear Normal at 5% Significance Level**		
384				Theta Star	1.487							
385				nu star	26.18							
386												
387				A-D Test Statistic	0.347					**Nonparametric Statistics**		
388				5% A-D Critical Value	0.7					Kaplan-Meier (KM) Method		
389				K-S Test Statistic	0.7					Mean	2.858	
390				5% K-S Critical Value	0.333					SD	1.581	
391				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.618	
392										95% KM (t) UCL	4.029	
393				**Assuming Gamma Distribution**						95% KM (z) UCL	3.875	
394				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	3.99	
395				Minimum	1.32					95% KM (bootstrap t) UCL	5.124	
396				Maximum	5.84					95% KM (BCA) UCL	3.993	
397				Mean	3.019					95% KM (Percentile Bootstrap) UCL	3.885	
398				Median	2.55					95% KM (Chebyshev) UCL	5.552	
399				SD	1.658					97.5% KM (Chebyshev) UCL	6.717	
400				k star	2.587					99% KM (Chebyshev) UCL	9.007	
401				Theta star	1.167							
402				Nu star	41.39					**Potential UCLs to Use**		
403				AppChi2	27.65					95% KM (t) UCL	4.029	
404				95% Gamma Approximate UCL	4.52					95% KM (Percentile Bootstrap) UCL	3.885	
405				95% Adjusted Gamma UCL	5.031							
406	**Note: DL/2 is not a recommended method.**											
407												
408												
409	**Fluoride (cw-3m)**											
410												
411										**General Statistics**		
412				Number of Valid Data	8					Number of Detected Data	7	
413				Number of Distinct Detected Data	7					Number of Non-Detect Data	1	
414										Percent Non-Detects	12.50%	
415												
416				**Raw Statistics**						**Log-transformed Statistics**		
417				Minimum Detected	2.22					Minimum Detected	0.798	
418				Maximum Detected	3.58					Maximum Detected	1.275	
419				Mean of Detected	2.774					Mean of Detected	1.008	
420				SD of Detected	0.478					SD of Detected	0.17	
421				Minimum Non-Detect	5					Minimum Non-Detect	1.609	
422				Maximum Non-Detect	5					Maximum Non-Detect	1.609	
423												
424												

	A	B	C	D	E	F	G	H	I	J	K	L
425	**Warning: There are only 7 Detected Values in this data**											
426	**Note: It should be noted that even though bootstrap may be performed on this data set**											
427	**the resulting calculations may not be reliable enough tp draw conclusions**											
428												
429	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
430												
431												
432	**UCL Statistics**											
433	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
434					Shapiro Wilk Test Statistic	0.956					Shapiro Wilk Test Statistic	0.966
435					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
436	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
437												
438	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
439					DL/2 Substitution Method						DL/2 Substitution Method	
440					Mean	2.74					Mean	0.996
441					SD	0.453					SD	0.161
442					95% DL/2 (t) UCL	3.044					95% H-Stat (DL/2) UCL	4.249
443												
444					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
445	**MLE method failed to converge properly**										Mean in Log Scale	1.008
446											SD in Log Scale	0.157
447											Mean in Original Scale	2.77
448											SD in Original Scale	0.443
449											95% Percentile Bootstrap UCL	3.006
450											95% BCA Bootstrap UCL	3.059
451												
452	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
453					k star (bias corrected)	23.09	**Data appear Normal at 5% Significance Level**					
454					Theta Star	0.12						
455					nu star	323.3						
456												
457					A-D Test Statistic	0.197	**Nonparametric Statistics**					
458					5% A-D Critical Value	0.707					Kaplan-Meier (KM) Method	
459					K-S Test Statistic	0.707					Mean	2.774
460					5% K-S Critical Value	0.311					SD	0.443
461	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.181
462											95% KM (t) UCL	3.117
463	**Assuming Gamma Distribution**										95% KM (z) UCL	3.072
464					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	3.12
465					Minimum	2.22					95% KM (bootstrap t) UCL	3.183
466					Maximum	3.58					95% KM (BCA) UCL	3.068
467					Mean	2.784					95% KM (Percentile Bootstrap) UCL	3.051
468					Median	2.812					95% KM (Chebyshev) UCL	3.562
469					SD	0.444					97.5% KM (Chebyshev) UCL	3.903
470					k star	28.7					99% KM (Chebyshev) UCL	4.573
471					Theta star	0.097						
472					Nu star	459.1	**Potential UCLs to Use**					
473					AppChi2	410.5					95% KM (t) UCL	3.117
474					95% Gamma Approximate UCL	3.115					95% KM (Percentile Bootstrap) UCL	3.051
475					95% Adjusted Gamma UCL	3.206						
476	**Note: DL/2 is not a recommended method.**											
477												

	A	B	C	D	E	F	G	H	I	J	K	L
478												
479	**Fluoride (cw-4d)**											
480												
481						**General Statistics**							
482						Number of Valid Data	8				Number of Detected Data	7
483						Number of Distinct Detected Data	7				Number of Non-Detect Data	1
484											Percent Non-Detects	12.50%
485												
486					**Raw Statistics**					**Log-transformed Statistics**		
487					Minimum Detected	1.01				Minimum Detected	0.00995	
488					Maximum Detected	5.01				Maximum Detected	1.611	
489					Mean of Detected	3.073				Mean of Detected	1.006	
490					SD of Detected	1.42				SD of Detected	0.56	
491					Minimum Non-Detect	5				Minimum Non-Detect	1.609	
492					Maximum Non-Detect	5				Maximum Non-Detect	1.609	
493												
494												
495					**Warning: There are only 7 Detected Values in this data**							
496					**Note: It should be noted that even though bootstrap may be performed on this data set**							
497					**the resulting calculations may not be reliable enough tp draw conclusions**							
498												
499					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
500												
501												
502						**UCL Statistics**						
503					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
504					Shapiro Wilk Test Statistic	0.958				Shapiro Wilk Test Statistic	0.914	
505					5% Shapiro Wilk Critical Value	0.803				5% Shapiro Wilk Critical Value	0.803	
506					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
507												
508					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
509					DL/2 Substitution Method					DL/2 Substitution Method		
510					Mean	3.001				Mean	0.995	
511					SD	1.33				SD	0.519	
512					95% DL/2 (t) UCL	3.892				95% H-Stat (DL/2) UCL	8.332	
513												
514					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
515					**MLE method failed to converge properly**					Mean in Log Scale	0.991	
516										SD in Log Scale	0.52	
517										Mean in Original Scale	2.991	
518										SD in Original Scale	1.335	
519										95% Percentile Bootstrap UCL	3.716	
520										95% BCA Bootstrap UCL	3.697	
521												
522					**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**		
523					k star (bias corrected)	2.642				**Data appear Normal at 5% Significance Level**		
524					Theta Star	1.163						
525					nu star	36.99						
526												
527					A-D Test Statistic	0.298				**Nonparametric Statistics**		
528					5% A-D Critical Value	0.71				Kaplan-Meier (KM) Method		
529					K-S Test Statistic	0.71				Mean	3.033	
530					5% K-S Critical Value	0.313				SD	1.298	

531	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.523
532											95% KM (t) UCL	4.023
533	Assuming Gamma Distribution										95% KM (z) UCL	3.892
534	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	4.032
535	Minimum	1.01									95% KM (bootstrap t) UCL	4.017
536	Maximum	5.01									95% KM (BCA) UCL	3.84
537	Mean	3.088									95% KM (Percentile Bootstrap) UCL	3.86
538	Median	3.196									95% KM (Chebyshev) UCL	5.311
539	SD	1.316									97.5% KM (Chebyshev) UCL	6.296
540	k star	3.25									99% KM (Chebyshev) UCL	8.232
541	Theta star	0.95										
542	Nu star	52.01									Potential UCLs to Use	
543	AppChi2	36.44									95% KM (t) UCL	4.023
544	95% Gamma Approximate UCL	4.407									95% KM (Percentile Bootstrap) UCL	3.86
545	95% Adjusted Gamma UCL	4.84										
546	Note: DL/2 is not a recommended method.											
547												
548												
549	Fluoride (cw-4m)											
550												
551	General Statistics											
552	Number of Valid Data	8									Number of Detected Data	7
553	Number of Distinct Detected Data	7									Number of Non-Detect Data	1
554											Percent Non-Detects	12.50%
555												
556	Raw Statistics										Log-transformed Statistics	
557	Minimum Detected	1.5									Minimum Detected	0.405
558	Maximum Detected	2.42									Maximum Detected	0.884
559	Mean of Detected	1.963									Mean of Detected	0.66
560	SD of Detected	0.35									SD of Detected	0.182
561	Minimum Non-Detect	5									Minimum Non-Detect	1.609
562	Maximum Non-Detect	5									Maximum Non-Detect	1.609
563												
564												
565	Warning: There are only 7 Detected Values in this data											
566	Note: It should be noted that even though bootstrap may be performed on this data set											
567	the resulting calculations may not be reliable enough tp draw conclusions											
568												
569	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
570												
571												
572	UCL Statistics											
573	Normal Distribution Test with Detected Values Only										Lognormal Distribution Test with Detected Values Only	
574	Shapiro Wilk Test Statistic	0.941									Shapiro Wilk Test Statistic	0.937
575	5% Shapiro Wilk Critical Value	0.803									5% Shapiro Wilk Critical Value	0.803
576	Data appear Normal at 5% Significance Level										Data appear Lognormal at 5% Significance Level	
577												
578	Assuming Normal Distribution										Assuming Lognormal Distribution	
579	DL/2 Substitution Method										DL/2 Substitution Method	
580	Mean	2.03									Mean	0.692
581	SD	0.376									SD	0.191
582	95% DL/2 (t) UCL	2.282									95% H-Stat (DL/2) UCL	3.585
583												

584					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
585					**MLE method failed to converge properly**						Mean in Log Scale	0.66
586											SD in Log Scale	0.168
587											Mean in Original Scale	1.959
588											SD in Original Scale	0.324
589											95% Percentile Bootstrap UCL	2.136
590											95% BCA Bootstrap UCL	2.143
591												
592					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
593					k star (bias corrected)	20.59					**Data appear Normal at 5% Significance Level**	
594					Theta Star	0.0953						
595					nu star	288.2						
596												
597					A-D Test Statistic	0.297					**Nonparametric Statistics**	
598					5% A-D Critical Value	0.707					Kaplan-Meier (KM) Method	
599					K-S Test Statistic	0.707					Mean	1.963
600					5% K-S Critical Value	0.311					SD	0.324
601					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.132
602											95% KM (t) UCL	2.214
603					**Assuming Gamma Distribution**						95% KM (z) UCL	2.181
604					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	2.216
605					Minimum	1.5					95% KM (bootstrap t) UCL	2.216
606					Maximum	2.42					95% KM (BCA) UCL	2.163
607					Mean	1.97					95% KM (Percentile Bootstrap) UCL	2.16
608					Median	2.012					95% KM (Chebyshev) UCL	2.54
609					SD	0.325					97.5% KM (Chebyshev) UCL	2.789
610					k star	25.58					99% KM (Chebyshev) UCL	3.28
611					Theta star	0.077						
612					Nu star	409.3					**Potential UCLs to Use**	
613					AppChi2	363.4					95% KM (t) UCL	2.214
614					95% Gamma Approximate UCL	2.219					95% KM (Percentile Bootstrap) UCL	2.16
615					95% Adjusted Gamma UCL	2.289						
616	**Note: DL/2 is not a recommended method.**											
617												
618												
619	**Fluoride (mw-1)**											
620												
621						**General Statistics**							
622					Number of Valid Observations	7					Number of Distinct Observations	7
623												
624					**Raw Statistics**						**Log-transformed Statistics**	
625					Minimum	0.735					Minimum of Log Data	-0.308
626					Maximum	7.95					Maximum of Log Data	2.073
627					Mean	2.118					Mean of log Data	0.379
628					Median	1.1					SD of log Data	0.798
629					SD	2.592						
630					Coefficient of Variation	1.224						
631					Skewness	2.561						
632												
633												
634	**Warning: A sample size of 'n' = 7 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
635												
636	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											

637	If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
638												
639												
640	Warning: There are only 7 Values in this data											
641	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
642	the resulting calculations may not be reliable enough to draw conclusions											
643												
644	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
645												
646	Relevant UCL Statistics											
647	Normal Distribution Test						Lognormal Distribution Test					
648				Shapiro Wilk Test Statistic	0.569					Shapiro Wilk Test Statistic	0.777	
649				Shapiro Wilk Critical Value	0.803					Shapiro Wilk Critical Value	0.803	
650	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
651												
652	Assuming Normal Distribution						Assuming Lognormal Distribution					
653				95% Student's-t UCL	4.022					95% H-UCL	5.607	
654	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL	4.422	
655				95% Adjusted-CLT UCL	4.743					97.5% Chebyshev (MVUE) UCL	5.512	
656				95% Modified-t UCL	4.18					99% Chebyshev (MVUE) UCL	7.653	
657												
658	Gamma Distribution Test						Data Distribution					
659				k star (bias corrected)	0.947		Data do not follow a Discernable Distribution (0.05)					
660				Theta Star	2.236							
661				nu star	13.26							
662				Approximate Chi Square Value (.05)	6.069		Nonparametric Statistics					
663				Adjusted Level of Significance	0.0158					95% CLT UCL	3.729	
664				Adjusted Chi Square Value	4.682					95% Jackknife UCL	4.022	
665										95% Standard Bootstrap UCL	3.606	
666				Anderson-Darling Test Statistic	1.064					95% Bootstrap-t UCL	12.35	
667				Anderson-Darling 5% Critical Value	0.721					95% Hall's Bootstrap UCL	11.5	
668				Kolmogorov-Smirnov Test Statistic	0.375					95% Percentile Bootstrap UCL	3.966	
669				Kolmogorov-Smirnov 5% Critical Value	0.317					95% BCA Bootstrap UCL	4.243	
670	Data not Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL	6.388	
671										97.5% Chebyshev(Mean, Sd) UCL	8.236	
672	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL	11.87	
673				95% Approximate Gamma UCL	4.628							
674				95% Adjusted Gamma UCL	5.999							
675												
676	Potential UCL to Use									Use 95% Chebyshev (Mean, Sd) UCL	6.388	
677												
678												
679	Fluoride (mw-10)											
680												
681	General Statistics											
682				Number of Valid Observations	6					Number of Distinct Observations	6	
683												
684	Raw Statistics						Log-transformed Statistics					
685				Minimum	10					Minimum of Log Data	2.303	
686				Maximum	24.6					Maximum of Log Data	3.203	
687				Mean	16.17					Mean of log Data	2.716	
688				Median	13.8					SD of log Data	0.398	
689				SD	6.584							

Coefficient of Variation	0.407	
Skewness	0.623	

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.829	Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	21.58	95% H-UCL	25.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.57
95% Adjusted-CLT UCL	21.32	97.5% Chebyshev (MVUE) UCL	32.51
95% Modified-t UCL	21.7	99% Chebyshev (MVUE) UCL	42.22
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.907	**Data appear Normal at 5% Significance Level**	
Theta Star	4.138		
nu star	46.88		
Approximate Chi Square Value (.05)	32.17	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	20.59
Adjusted Chi Square Value	27.84	95% Jackknife UCL	21.58
		95% Standard Bootstrap UCL	20.19
Anderson-Darling Test Statistic	0.515	95% Bootstrap-t UCL	25.3
Anderson-Darling 5% Critical Value	0.698	95% Hall's Bootstrap UCL	23.72
Kolmogorov-Smirnov Test Statistic	0.265	95% Percentile Bootstrap UCL	20.18
Kolmogorov-Smirnov 5% Critical Value	0.333	95% BCA Bootstrap UCL	20.63
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	27.88
		97.5% Chebyshev(Mean, Sd) UCL	32.95
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	42.91
95% Approximate Gamma UCL	23.56		
95% Adjusted Gamma UCL	27.22		
Potential UCL to Use		Use 95% Student's-t UCL	21.58

Fluoride (mw-11)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	6

Raw Statistics		
Minimum	0.6	
Maximum	1.4	
Mean	0.95	
Median	0.975	
SD	0.276	
Coefficient of Variation	0.29	
Skewness	0.545	

Log-transformed Statistics	
Minimum of Log Data	-0.511
Maximum of Log Data	0.336
Mean of log Data	-0.0867
SD of log Data	0.293

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.177	95% H-UCL	1.28
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.446
95% Adjusted-CLT UCL	1.162	97.5% Chebyshev (MVUE) UCL	1.661
95% Modified-t UCL	1.181	99% Chebyshev (MVUE) UCL	2.082
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	7.263	**Data appear Normal at 5% Significance Level**	
Theta Star	0.131		
nu star	87.16		
Approximate Chi Square Value (.05)	66.64	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	1.135
Adjusted Chi Square Value	60.19	95% Jackknife UCL	1.177
		95% Standard Bootstrap UCL	1.119
Anderson-Darling Test Statistic	0.304	95% Bootstrap-t UCL	1.217
Anderson-Darling 5% Critical Value	0.698	95% Hall's Bootstrap UCL	1.208
Kolmogorov-Smirnov Test Statistic	0.233	95% Percentile Bootstrap UCL	1.127
Kolmogorov-Smirnov 5% Critical Value	0.332	95% BCA Bootstrap UCL	1.132
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.44
		97.5% Chebyshev(Mean, Sd) UCL	1.652
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.069
95% Approximate Gamma UCL	1.243		
95% Adjusted Gamma UCL	1.376		

796	**Potential UCL to Use**										Use 95% Student's-t UCL	1.177
797												
798												
799	**Fluoride (mw-12)**											
800												
801	**General Statistics**											
802	Number of Valid Observations				6		Number of Distinct Observations					5
803												
804	**Raw Statistics**						**Log-transformed Statistics**					
805	Minimum				2.9		Minimum of Log Data					1.065
806	Maximum				6.59		Maximum of Log Data					1.886
807	Mean				3.985		Mean of log Data					1.342
808	Median				3.81		SD of log Data					0.3
809	SD				1.358							
810	Coefficient of Variation				0.341							
811	Skewness				1.811							
812												
813												
814	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
815												
816	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
817	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
818												
819												
820	**Warning: There are only 6 Values in this data**											
821	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
822	**the resulting calculations may not be reliable enough to draw conclusions**											
823												
824	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
825												
826	**Relevant UCL Statistics**											
827	**Normal Distribution Test**						**Lognormal Distribution Test**					
828	Shapiro Wilk Test Statistic				0.77		Shapiro Wilk Test Statistic					0.837
829	Shapiro Wilk Critical Value				0.788		Shapiro Wilk Critical Value					0.788
830	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
831												
832	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
833	95% Student's-t UCL				5.102		95% H-UCL					5.395
834	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					6.092
835	95% Adjusted-CLT UCL				5.335		97.5% Chebyshev (MVUE) UCL					7.009
836	95% Modified-t UCL				5.17		99% Chebyshev (MVUE) UCL					8.811
837												
838	**Gamma Distribution Test**						**Data Distribution**					
839	k star (bias corrected)				6.334		**Data appear Gamma Distributed at 5% Significance Level**					
840	Theta Star				0.629							
841	nu star				76.01							
842	Approximate Chi Square Value (.05)				56.93		**Nonparametric Statistics**					
843	Adjusted Level of Significance				0.0122		95% CLT UCL					4.897
844	Adjusted Chi Square Value				51.01		95% Jackknife UCL					5.102
845							95% Standard Bootstrap UCL					4.831
846	Anderson-Darling Test Statistic				0.607		95% Bootstrap-t UCL					6.236
847	Anderson-Darling 5% Critical Value				0.698		95% Hall's Bootstrap UCL					8.903
848	Kolmogorov-Smirnov Test Statistic				0.326		95% Percentile Bootstrap UCL					4.912

849				Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	5.073	
850				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	6.401	
851										97.5% Chebyshev(Mean, Sd) UCL	7.446	
852				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	9.5	
853				95% Approximate Gamma UCL	5.321							
854				95% Adjusted Gamma UCL	5.938							
855												
856				**Potential UCL to Use**						Use 95% Approximate Gamma UCL	5.321	
857												
858												
859	**Fluoride (mw-13)**											
860												
861				**General Statistics**								
862				Number of Valid Observations	6					Number of Distinct Observations	6	
863												
864				**Raw Statistics**						**Log-transformed Statistics**		
865				Minimum	0.71					Minimum of Log Data	-0.342	
866				Maximum	1.5					Maximum of Log Data	0.405	
867				Mean	1.182					Mean of log Data	0.138	
868				Median	1.24					SD of log Data	0.274	
869				SD	0.288							
870				Coefficient of Variation	0.244							
871				Skewness	-0.846							
872												
873												
874				**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**								
875												
876				**It is suggested to collect at least 8 to 10 observations using these statistical methods!**								
877				**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**								
878												
879												
880				**Warning: There are only 6 Values in this data**								
881				**Note: It should be noted that even though bootstrap methods may be performed on this data set,**								
882				**the resulting calculations may not be reliable enough to draw conclusions**								
883												
884				**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**								
885												
886				**Relevant UCL Statistics**								
887				**Normal Distribution Test**						**Lognormal Distribution Test**		
888				Shapiro Wilk Test Statistic	0.949					Shapiro Wilk Test Statistic	0.901	
889				Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788	
890				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
891												
892				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
893				95% Student's-t UCL	1.419					95% H-UCL	1.557	
894				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	1.761	
895				95% Adjusted-CLT UCL	1.332					97.5% Chebyshev (MVUE) UCL	2.011	
896				95% Modified-t UCL	1.412					99% Chebyshev (MVUE) UCL	2.501	
897												
898				**Gamma Distribution Test**						**Data Distribution**		
899				k star (bias corrected)	8.868					**Data appear Normal at 5% Significance Level**		
900				Theta Star	0.133							
901				nu star	106.4							

902					Approximate Chi Square Value (.05)	83.61		**Nonparametric Statistics**				
903					Adjusted Level of Significance	0.0122					95% CLT UCL	1.375
904					Adjusted Chi Square Value	76.32					95% Jackknife UCL	1.419
905											95% Standard Bootstrap UCL	1.365
906					Anderson-Darling Test Statistic	0.323					95% Bootstrap-t UCL	1.379
907					Anderson-Darling 5% Critical Value	0.697					95% Hall's Bootstrap UCL	1.331
908					Kolmogorov-Smirnov Test Statistic	0.224					95% Percentile Bootstrap UCL	1.347
909					Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	1.323
910					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1.694
911											97.5% Chebyshev(Mean, Sd) UCL	1.916
912					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	2.351
913					95% Approximate Gamma UCL	1.504						
914					95% Adjusted Gamma UCL	1.648						
915												
916					**Potential UCL to Use**						Use 95% Student's-t UCL	1.419
917												
918												
919	**Fluoride (mw-14)**											
920												
921					**General Statistics**							
922					Number of Valid Observations	6					Number of Distinct Observations	6
923												
924					**Raw Statistics**			**Log-transformed Statistics**				
925					Minimum	1.8					Minimum of Log Data	0.588
926					Maximum	3.2					Maximum of Log Data	1.163
927					Mean	2.327					Mean of log Data	0.828
928					Median	2.28					SD of log Data	0.196
929					SD	0.484						
930					Coefficient of Variation	0.208						
931					Skewness	1.283						
932												
933												
934					**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**							
935												
936					**It is suggested to collect at least 8 to 10 observations using these statistical methods!**							
937					**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
938												
939												
940					**Warning: There are only 6 Values in this data**							
941					**Note: It should be noted that even though bootstrap methods may be performed on this data set,**							
942					**the resulting calculations may not be reliable enough to draw conclusions**							
943												
944					**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**							
945												
946					**Relevant UCL Statistics**							
947					**Normal Distribution Test**			**Lognormal Distribution Test**				
948					Shapiro Wilk Test Statistic	0.901					Shapiro Wilk Test Statistic	0.946
949					Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788
950					**Data appear Normal at 5% Significance Level**			**Data appear Lognormal at 5% Significance Level**				
951												
952					**Assuming Normal Distribution**			**Assuming Lognormal Distribution**				
953					95% Student's-t UCL	2.724					95% H-UCL	2.797
954					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	3.138

955				95% Adjusted-CLT UCL	2.762				97.5% Chebyshev (MVUE) UCL	3.49		
956				95% Modified-t UCL	2.742				99% Chebyshev (MVUE) UCL	4.181		
957												
958				**Gamma Distribution Test**					**Data Distribution**			
959				k star (bias corrected)	15.2				**Data appear Normal at 5% Significance Level**			
960				Theta Star	0.153							
961				nu star	182.4							
962				Approximate Chi Square Value (.05)	152.2				**Nonparametric Statistics**			
963				Adjusted Level of Significance	0.0122				95% CLT UCL	2.651		
964				Adjusted Chi Square Value	142.2				95% Jackknife UCL	2.724		
965									95% Standard Bootstrap UCL	2.62		
966				Anderson-Darling Test Statistic	0.307				95% Bootstrap-t UCL	2.895		
967				Anderson-Darling 5% Critical Value	0.697				95% Hall's Bootstrap UCL	4.251		
968				Kolmogorov-Smirnov Test Statistic	0.242				95% Percentile Bootstrap UCL	2.633		
969				Kolmogorov-Smirnov 5% Critical Value	0.332				95% BCA Bootstrap UCL	2.693		
970				**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	3.187		
971									97.5% Chebyshev(Mean, Sd) UCL	3.56		
972				**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	4.291		
973				95% Approximate Gamma UCL	2.789							
974				95% Adjusted Gamma UCL	2.985							
975												
976				**Potential UCL to Use**					Use 95% Student's-t UCL	2.724		
977												
978												
979	**Fluoride (mw-15)**											
980												
981				**General Statistics**								
982				Number of Valid Observations	6				Number of Distinct Observations	6		
983												
984				**Raw Statistics**					**Log-transformed Statistics**			
985				Minimum	0.4				Minimum of Log Data	-0.916		
986				Maximum	1.3				Maximum of Log Data	0.262		
987				Mean	0.79				Mean of log Data	-0.303		
988				Median	0.815				SD of log Data	0.41		
989				SD	0.311							
990				Coefficient of Variation	0.393							
991				Skewness	0.583							
992												
993												
994	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
995												
996	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
997	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
998												
999												
1000	**Warning: There are only 6 Values in this data**											
1001	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
1002	**the resulting calculations may not be reliable enough to draw conclusions**											
1003												
1004	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
1005												
1006	**Relevant UCL Statistics**											
1007	**Normal Distribution Test**								**Lognormal Distribution Test**			

1008					Shapiro Wilk Test Statistic	0.941					Shapiro Wilk Test Statistic	0.953
1009					Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788
1010					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
1011												
1012					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1013					95% Student's-t UCL	1.046					95% H-UCL	1.256
1014					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	1.369
1015					95% Adjusted-CLT UCL	1.031					97.5% Chebyshev (MVUE) UCL	1.618
1016					95% Modified-t UCL	1.051					99% Chebyshev (MVUE) UCL	2.109
1017												
1018					**Gamma Distribution Test**						**Data Distribution**	
1019					k star (bias corrected)	3.901					**Data appear Normal at 5% Significance Level**	
1020					Theta Star	0.203						
1021					nu star	46.81						
1022					Approximate Chi Square Value (.05)	32.11					**Nonparametric Statistics**	
1023					Adjusted Level of Significance	0.0122					95% CLT UCL	0.999
1024					Adjusted Chi Square Value	27.78					95% Jackknife UCL	1.046
1025											95% Standard Bootstrap UCL	0.976
1026					Anderson-Darling Test Statistic	0.287					95% Bootstrap-t UCL	1.089
1027					Anderson-Darling 5% Critical Value	0.698					95% Hall's Bootstrap UCL	1.081
1028					Kolmogorov-Smirnov Test Statistic	0.229					95% Percentile Bootstrap UCL	0.99
1029					Kolmogorov-Smirnov 5% Critical Value	0.333					95% BCA Bootstrap UCL	1.007
1030					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1.343
1031											97.5% Chebyshev(Mean, Sd) UCL	1.582
1032					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	2.052
1033					95% Approximate Gamma UCL	1.152						
1034					95% Adjusted Gamma UCL	1.331						
1035												
1036					**Potential UCL to Use**						Use 95% Student's-t UCL	1.046
1037												
1038												
1039	**Fluoride (mw-19)**											
1040												
1041					**General Statistics**							
1042					Number of Valid Observations	5					Number of Distinct Observations	5
1043												
1044					**Raw Statistics**						**Log-transformed Statistics**	
1045					Minimum	1.7					Minimum of Log Data	0.531
1046					Maximum	2.5					Maximum of Log Data	0.916
1047					Mean	2.226					Mean of log Data	0.792
1048					Median	2.27					SD of log Data	0.152
1049					SD	0.31						
1050					Coefficient of Variation	0.139						
1051					Skewness	-1.668						
1052												
1053												
1054					**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**							
1055												
1056					**It is suggested to collect at least 8 to 10 observations using these statistical methods!**							
1057					**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
1058												
1059												
1060					**Warning: There are only 5 Values in this data**							

1061	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
1062	**the resulting calculations may not be reliable enough to draw conclusions**											
1063												
1064	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
1065												
1066	**Relevant UCL Statistics**											
1067	**Normal Distribution Test**						**Lognormal Distribution Test**					
1068	Shapiro Wilk Test Statistic				0.83		Shapiro Wilk Test Statistic					0.797
1069	Shapiro Wilk Critical Value				0.762		Shapiro Wilk Critical Value					0.762
1070	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1071												
1072	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1073	95% Student's-t UCL				2.522		95% H-UCL					2.621
1074	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					2.885
1075	95% Adjusted-CLT UCL				2.344		97.5% Chebyshev (MVUE) UCL					3.17
1076	95% Modified-t UCL				2.505		99% Chebyshev (MVUE) UCL					3.729
1077												
1078	**Gamma Distribution Test**						**Data Distribution**					
1079	k star (bias corrected)				23.19		**Data appear Normal at 5% Significance Level**					
1080	Theta Star				0.096							
1081	nu star				231.9							
1082	Approximate Chi Square Value (.05)				197.6		**Nonparametric Statistics**					
1083	Adjusted Level of Significance				0.0086		95% CLT UCL					2.454
1084	Adjusted Chi Square Value				183.7		95% Jackknife UCL					2.522
1085							95% Standard Bootstrap UCL					2.428
1086	Anderson-Darling Test Statistic				0.601		95% Bootstrap-t UCL					2.415
1087	Anderson-Darling 5% Critical Value				0.678		95% Hall's Bootstrap UCL					2.348
1088	Kolmogorov-Smirnov Test Statistic				0.363		95% Percentile Bootstrap UCL					2.404
1089	Kolmogorov-Smirnov 5% Critical Value				0.357		95% BCA Bootstrap UCL					2.384
1090	**Data follow Appr. Gamma Distribution at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					2.831
1091							97.5% Chebyshev(Mean, Sd) UCL					3.093
1092	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					3.607
1093	95% Approximate Gamma UCL				2.612							
1094	95% Adjusted Gamma UCL				2.81							
1095												
1096	**Potential UCL to Use**						Use 95% Student's-t UCL					2.522
1097	**Recommended UCL exceeds the maximum observation**											
1098												
1099												
1100	**Fluoride (mw-20-100)**											
1101												
1102	**General Statistics**											
1103	Number of Valid Observations				6		Number of Distinct Observations					6
1104												
1105	**Raw Statistics**						**Log-transformed Statistics**					
1106	Minimum				1.9		Minimum of Log Data					0.642
1107	Maximum				4.77		Maximum of Log Data					1.562
1108	Mean				3.338		Mean of log Data					1.169
1109	Median				3.45		SD of log Data					0.306
1110	SD				0.943							
1111	Coefficient of Variation				0.282							
1112	Skewness				-0.0459							
1113												

	A	B	C	D	E	F	G	H	I	J	K	L
1114												
1115	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
1116												
1117	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
1118	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1119												
1120												
1121	**Warning: There are only 6 Values in this data**											
1122	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
1123	**the resulting calculations may not be reliable enough to draw conclusions**											
1124												
1125	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
1126												
1127	**Relevant UCL Statistics**											
1128	**Normal Distribution Test**						**Lognormal Distribution Test**					
1129	Shapiro Wilk Test Statistic	0.956					Shapiro Wilk Test Statistic	0.926				
1130	Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788				
1131	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1132												
1133	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1134	95% Student's-t UCL	4.114					95% H-UCL	4.582				
1135	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	5.169				
1136	95% Adjusted-CLT UCL	3.964					97.5% Chebyshev (MVUE) UCL	5.958				
1137	95% Modified-t UCL	4.113					99% Chebyshev (MVUE) UCL	7.507				
1138												
1139	**Gamma Distribution Test**						**Data Distribution**					
1140	k star (bias corrected)	7.001					**Data appear Normal at 5% Significance Level**					
1141	Theta Star	0.477										
1142	nu star	84.01										
1143	Approximate Chi Square Value (.05)	63.89					**Nonparametric Statistics**					
1144	Adjusted Level of Significance	0.0122					95% CLT UCL	3.972				
1145	Adjusted Chi Square Value	57.59					95% Jackknife UCL	4.114				
1146							95% Standard Bootstrap UCL	3.909				
1147	Anderson-Darling Test Statistic	0.331					95% Bootstrap-t UCL	4.061				
1148	Anderson-Darling 5% Critical Value	0.698					95% Hall's Bootstrap UCL	4.084				
1149	Kolmogorov-Smirnov Test Statistic	0.229					95% Percentile Bootstrap UCL	3.907				
1150	Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	3.89				
1151	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	5.016				
1152							97.5% Chebyshev(Mean, Sd) UCL	5.742				
1153	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	7.169				
1154	95% Approximate Gamma UCL	4.39										
1155	95% Adjusted Gamma UCL	4.87										
1156												
1157	**Potential UCL to Use**						Use 95% Student's-t UCL	4.114				
1158												
1159												
1160	**Fluoride (mw-20-130)**											
1161												
1162	**General Statistics**											
1163	Number of Valid Observations	6					Number of Distinct Observations	5				
1164												
1165	**Raw Statistics**						**Log-transformed Statistics**					
1166	Minimum	2.45					Minimum of Log Data	0.896				

Maximum	3.6	Maximum of Log Data 1.281
Mean	3.045	Mean of log Data 1.104
Median	3.2	SD of log Data 0.156
SD	0.458	
Coefficient of Variation	0.151	
Skewness	-0.499	

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.874	Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	3.422	95% H-UCL	3.512
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.892
95% Adjusted-CLT UCL	3.312	97.5% Chebyshev (MVUE) UCL	4.258
95% Modified-t UCL	3.416	99% Chebyshev (MVUE) UCL	4.978
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	25.4	**Data appear Normal at 5% Significance Level**	
Theta Star	0.12		
nu star	304.8		
Approximate Chi Square Value (.05)	265.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	3.353
Adjusted Chi Square Value	252	95% Jackknife UCL	3.422
		95% Standard Bootstrap UCL	3.322
Anderson-Darling Test Statistic	0.552	95% Bootstrap-t UCL	3.391
Anderson-Darling 5% Critical Value	0.697	95% Hall's Bootstrap UCL	3.271
Kolmogorov-Smirnov Test Statistic	0.323	95% Percentile Bootstrap UCL	3.303
Kolmogorov-Smirnov 5% Critical Value	0.332	95% BCA Bootstrap UCL	3.292
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.861
		97.5% Chebyshev(Mean, Sd) UCL	4.214
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.907
95% Approximate Gamma UCL	3.498		
95% Adjusted Gamma UCL	3.683		
Potential UCL to Use		Use 95% Student's-t UCL	3.422

	A	B	C	D	E	F	G	H	I	J	K	L
1220	Fluoride (mw-20-70)											
1221												
1222	General Statistics											
1223	Number of Valid Observations					7	Number of Distinct Observations					7
1224												
1225	Raw Statistics						Log-transformed Statistics					
1226	Minimum					1.34	Minimum of Log Data					0.293
1227	Maximum					2.66	Maximum of Log Data					0.978
1228	Mean					2.04	Mean of log Data					0.694
1229	Median					2.1	SD of log Data					0.216
1230	SD					0.413						
1231	Coefficient of Variation					0.202						
1232	Skewness					-0.324						
1233												
1234												
1235	Warning: A sample size of 'n' = 7 may not adequate enough to compute meaningful and reliable test statistics and estimates!											
1236												
1237	It is suggested to collect at least 8 to 10 observations using these statistical methods!											
1238	If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1239												
1240												
1241	Warning: There are only 7 Values in this data											
1242	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
1243	the resulting calculations may not be reliable enough to draw conclusions											
1244												
1245	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
1246												
1247	Relevant UCL Statistics											
1248	Normal Distribution Test						Lognormal Distribution Test					
1249	Shapiro Wilk Test Statistic					0.98	Shapiro Wilk Test Statistic					0.946
1250	Shapiro Wilk Critical Value					0.803	Shapiro Wilk Critical Value					0.803
1251	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1252												
1253	Assuming Normal Distribution						Assuming Lognormal Distribution					
1254	95% Student's-t UCL					2.343	95% H-UCL					2.448
1255	95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL					2.769
1256	95% Adjusted-CLT UCL					2.276	97.5% Chebyshev (MVUE) UCL					3.083
1257	95% Modified-t UCL					2.34	99% Chebyshev (MVUE) UCL					3.701
1258												
1259	Gamma Distribution Test						Data Distribution					
1260	k star (bias corrected)					15.21	Data appear Normal at 5% Significance Level					
1261	Theta Star					0.134						
1262	nu star					212.9						
1263	Approximate Chi Square Value (.05)					180.1	Nonparametric Statistics					
1264	Adjusted Level of Significance					0.0158	95% CLT UCL					2.297
1265	Adjusted Chi Square Value					171	95% Jackknife UCL					2.343
1266							95% Standard Bootstrap UCL					2.276
1267	Anderson-Darling Test Statistic					0.247	95% Bootstrap-t UCL					2.325
1268	Anderson-Darling 5% Critical Value					0.707	95% Hall's Bootstrap UCL					2.324
1269	Kolmogorov-Smirnov Test Statistic					0.172	95% Percentile Bootstrap UCL					2.269
1270	Kolmogorov-Smirnov 5% Critical Value					0.311	95% BCA Bootstrap UCL					2.257
1271	Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL					2.72
1272							97.5% Chebyshev(Mean, Sd) UCL					3.014

1273	Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL					3.592
1274				95% Approximate Gamma UCL	2.411							
1275				95% Adjusted Gamma UCL	2.54							
1276												
1277	Potential UCL to Use						Use 95% Student's-t UCL					2.343
1278												
1279												
1280	Fluoride (mw-21)											
1281												
1282	General Statistics											
1283				Number of Valid Data	4		Number of Detected Data					3
1284				Number of Distinct Detected Data	2		Number of Non-Detect Data					1
1285							Percent Non-Detects					25.00%
1286												
1287	Warning: This data set only has 4 observations!											
1288	Data set is too small to compute reliable and meaningful statistics and estimates!											
1289	The data set for variable Fluoride (mw-21) was not processed!											
1290												
1291	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1292	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1293												
1294												
1295												
1296	Fluoride (mw-22)											
1297												
1298	General Statistics											
1299				Number of Valid Data	5		Number of Detected Data					4
1300				Number of Distinct Detected Data	4		Number of Non-Detect Data					1
1301							Percent Non-Detects					20.00%
1302												
1303	Raw Statistics						Log-transformed Statistics					
1304				Minimum Detected	1.4		Minimum Detected					0.336
1305				Maximum Detected	3.2		Maximum Detected					1.163
1306				Mean of Detected	2.488		Mean of Detected					0.867
1307				SD of Detected	0.766		SD of Detected					0.364
1308				Minimum Non-Detect	0.5		Minimum Non-Detect					-0.693
1309				Maximum Non-Detect	0.5		Maximum Non-Detect					-0.693
1310												
1311												
1312	Warning: There are only 4 Distinct Detected Values in this data											
1313	Note: It should be noted that even though bootstrap may be performed on this data set											
1314	the resulting calculations may not be reliable enough tp draw conclusions											
1315												
1316	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
1317												
1318												
1319	UCL Statistics											
1320	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1321				Shapiro Wilk Test Statistic	0.88		Shapiro Wilk Test Statistic					0.823
1322				5% Shapiro Wilk Critical Value	0.748		5% Shapiro Wilk Critical Value					0.748
1323	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1324												
1325	Assuming Normal Distribution						Assuming Lognormal Distribution					

1326				DL/2 Substitution Method						DL/2 Substitution Method		
1327				Mean	2.04					Mean	0.416	
1328				SD	1.201					SD	1.056	
1329				95% DL/2 (t) UCL	3.185					95% H-Stat (DL/2) UCL	6.622	
1330												
1331				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
1332				Mean	1.973					Mean in Log Scale	0.695	
1333				SD	1.21					SD in Log Scale	0.496	
1334				95% MLE (t) UCL	3.126					Mean in Original Scale	2.192	
1335				95% MLE (Tiku) UCL	3.202					SD in Original Scale	0.937	
1336										95% Percentile Bootstrap UCL	2.78	
1337										95% BCA Bootstrap UCL	2.77	
1338												
1339				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1340				k star (bias corrected)	3.022					**Data appear Normal at 5% Significance Level**		
1341				Theta Star	0.823							
1342				nu star	24.17							
1343												
1344				A-D Test Statistic	0.512					**Nonparametric Statistics**		
1345				5% A-D Critical Value	0.657					Kaplan-Meier (KM) Method		
1346				K-S Test Statistic	0.657					Mean	2.27	
1347				5% K-S Critical Value	0.395					SD	0.736	
1348				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.38	
1349										95% KM (t) UCL	3.08	
1350				**Assuming Gamma Distribution**						95% KM (z) UCL	2.895	
1351				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	3.201	
1352				Minimum	1.4					95% KM (bootstrap t) UCL	2.715	
1353				Maximum	3.2					95% KM (BCA) UCL	2.98	
1354				Mean	2.284					95% KM (Percentile Bootstrap) UCL	2.9	
1355				Median	2.65					95% KM (Chebyshev) UCL	3.927	
1356				SD	0.805					97.5% KM (Chebyshev) UCL	4.643	
1357				k star	3.809					99% KM (Chebyshev) UCL	6.051	
1358				Theta star	0.6							
1359				Nu star	38.09					**Potential UCLs to Use**		
1360				AppChi2	24.96					95% KM (t) UCL	3.08	
1361				95% Gamma Approximate UCL	3.486					95% KM (Percentile Bootstrap) UCL	2.9	
1362				95% Adjusted Gamma UCL	N/A							
1363	**Note: DL/2 is not a recommended method.**											
1364												
1365												
1366	**Fluoride (mw-23)**											
1367												
1368						**General Statistics**							
1369				Number of Valid Data	4					Number of Detected Data	2	
1370				Number of Distinct Detected Data	1					Number of Non-Detect Data	2	
1371										Percent Non-Detects	50.00%	
1372												
1373	**Warning: This data set only has 4 observations!**											
1374	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1375	**The data set for variable Fluoride (mw-23) was not processed!**											
1376												
1377	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1378	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											

	A	B	C	D	E	F	G	H	I	J	K	L
1379												
1380												
1381												
1382	**Fluoride (mw-24a)**											
1383												
1384						**General Statistics**							
1385						Number of Valid Observations	4				Number of Distinct Observations	4	
1386												
1387												
1388						**Warning: This data set only has 4 observations!**							
1389						**Data set is too small to compute reliable and meaningful statistics and estimates!**							
1390						**The data set for variable Fluoride (mw-24a) was not processed!**							
1391												
1392						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
1393						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
1394												
1395												
1396												
1397	**Fluoride (mw-24b)**											
1398												
1399						**General Statistics**							
1400						Number of Valid Observations	5				Number of Distinct Observations	4	
1401												
1402						**Raw Statistics**					**Log-transformed Statistics**		
1403						Minimum	1.8				Minimum of Log Data	0.588	
1404						Maximum	3.5				Maximum of Log Data	1.253	
1405						Mean	2.724				Mean of log Data	0.968	
1406						Median	2.7				SD of log Data	0.298	
1407						SD	0.778						
1408						Coefficient of Variation	0.286						
1409						Skewness	-0.066						
1410													
1411													
1412						**Warning: There are only 4 Distinct Values in this data**							
1413						**There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.**							
1414						**Those methods will return a 'N/A' value on your output display!**							
1415													
1416						**It is necessary to have 4 or more Distinct Values to compute bootstrap methods.**							
1417						**It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.**							
1418													
1419													
1420						**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**							
1421													
1422						**It is suggested to collect at least 8 to 10 observations using these statistical methods!**							
1423						**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
1424													
1425						**Relevant UCL Statistics**							
1426						**Normal Distribution Test**					**Lognormal Distribution Test**		
1427						Shapiro Wilk Test Statistic	0.883				Shapiro Wilk Test Statistic	0.894	
1428						Shapiro Wilk Critical Value	0.762				Shapiro Wilk Critical Value	0.762	
1429						**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
1430													
1431						**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		

1432				95% Student's-t UCL	3.466					95% H-UCL	3.93	
1433			**95% UCLs (Adjusted for Skewness)**							95% Chebyshev (MVUE) UCL	4.303	
1434			95% Adjusted-CLT UCL	3.286						97.5% Chebyshev (MVUE) UCL	4.985	
1435			95% Modified-t UCL	3.464						99% Chebyshev (MVUE) UCL	6.325	
1436												
1437			**Gamma Distribution Test**							**Data Distribution**		
1438			k star (bias corrected)	5.995						**Data appear Normal at 5% Significance Level**		
1439			Theta Star	0.454								
1440			nu star	59.95								
1441			Approximate Chi Square Value (.05)	43.15						**Nonparametric Statistics**		
1442			Adjusted Level of Significance	0.0086						95% CLT UCL	3.297	
1443			Adjusted Chi Square Value	37						95% Jackknife UCL	3.466	
1444										95% Standard Bootstrap UCL	3.225	
1445			Anderson-Darling Test Statistic	0.376						95% Bootstrap-t UCL	3.582	
1446			Anderson-Darling 5% Critical Value	0.679						95% Hall's Bootstrap UCL	3.332	
1447			Kolmogorov-Smirnov Test Statistic	0.261						95% Percentile Bootstrap UCL	3.18	
1448			Kolmogorov-Smirnov 5% Critical Value	0.357						95% BCA Bootstrap UCL	3.18	
1449			**Data appear Gamma Distributed at 5% Significance Level**							95% Chebyshev(Mean, Sd) UCL	4.241	
1450										97.5% Chebyshev(Mean, Sd) UCL	4.898	
1451			**Assuming Gamma Distribution**							99% Chebyshev(Mean, Sd) UCL	6.188	
1452			95% Approximate Gamma UCL	3.785								
1453			95% Adjusted Gamma UCL	4.413								
1454												
1455			**Potential UCL to Use**							Use 95% Student's-t UCL	3.466	
1456												
1457												
1458	**Fluoride (mw-24br)**											
1459												
1460					**General Statistics**							
1461			Number of Valid Observations	4						Number of Distinct Observations	4	
1462												
1463												
1464					**Warning: This data set only has 4 observations!**							
1465					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
1466					**The data set for variable Fluoride (mw-24br) was not processed!**							
1467												
1468					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
1469					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
1470												
1471												
1472												
1473	**Fluoride (mw-25)**											
1474												
1475					**General Statistics**							
1476			Number of Valid Observations	6						Number of Distinct Observations	4	
1477												
1478			**Raw Statistics**							**Log-transformed Statistics**		
1479			Minimum	1						Minimum of Log Data	0	
1480			Maximum	1.3						Maximum of Log Data	0.262	
1481			Mean	1.203						Mean of log Data	0.18	
1482			Median	1.25						SD of log Data	0.107	
1483			SD	0.124								
1484			Coefficient of Variation	0.103								

1485					Skewness	-0.998						
1486												
1487												
1488					Warning: There are only 4 Distinct Values in this data							
1489					There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.							
1490					Those methods will return a 'N/A' value on your output display!							
1491												
1492					It is necessary to have 4 or more Distinct Values to compute bootstrap methods.							
1493					It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.							
1494												
1495												
1496					Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!							
1497												
1498					It is suggested to collect at least 8 to 10 observations using these statistical methods!							
1499					If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
1500												
1501					Relevant UCL Statistics							
1502					Normal Distribution Test				Lognormal Distribution Test			
1503					Shapiro Wilk Test Statistic	0.833			Shapiro Wilk Test Statistic	0.827		
1504					Shapiro Wilk Critical Value	0.788			Shapiro Wilk Critical Value	0.788		
1505					Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
1506												
1507					Assuming Normal Distribution				Assuming Lognormal Distribution			
1508					95% Student's-t UCL	1.305			95% H-UCL	1.322		
1509					95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	1.433		
1510					95% Adjusted-CLT UCL	1.264			97.5% Chebyshev (MVUE) UCL	1.532		
1511					95% Modified-t UCL	1.302			99% Chebyshev (MVUE) UCL	1.726		
1512												
1513					Gamma Distribution Test				Data Distribution			
1514					k star (bias corrected)	54.09			Data appear Normal at 5% Significance Level			
1515					Theta Star	0.0222						
1516					nu star	649.1						
1517					Approximate Chi Square Value (.05)	591			Nonparametric Statistics			
1518					Adjusted Level of Significance	0.0122			95% CLT UCL	1.286		
1519					Adjusted Chi Square Value	570.8			95% Jackknife UCL	1.305		
1520									95% Standard Bootstrap UCL	1.278		
1521					Anderson-Darling Test Statistic	0.561			95% Bootstrap-t UCL	1.286		
1522					Anderson-Darling 5% Critical Value	0.696			95% Hall's Bootstrap UCL	1.261		
1523					Kolmogorov-Smirnov Test Statistic	0.301			95% Percentile Bootstrap UCL	1.27		
1524					Kolmogorov-Smirnov 5% Critical Value	0.332			95% BCA Bootstrap UCL	1.267		
1525					Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	1.423		
1526									97.5% Chebyshev(Mean, Sd) UCL	1.518		
1527					Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	1.705		
1528					95% Approximate Gamma UCL	1.322						
1529					95% Adjusted Gamma UCL	1.369						
1530												
1531					Potential UCL to Use				Use 95% Student's-t UCL	1.305		
1532					Recommended UCL exceeds the maximum observation							
1533												
1534												
1535	Fluoride (mw-26)											
1536												
1537					General Statistics							

1538					Number of Valid Data	6					Number of Detected Data	5
1539					Number of Distinct Detected Data	5					Number of Non-Detect Data	1
1540											Percent Non-Detects	16.67%
1541												
1542					**Raw Statistics**						**Log-transformed Statistics**	
1543					Minimum Detected	0.32					Minimum Detected	-1.139
1544					Maximum Detected	0.835					Maximum Detected	-0.18
1545					Mean of Detected	0.599					Mean of Detected	-0.561
1546					SD of Detected	0.192					SD of Detected	0.363
1547					Minimum Non-Detect	0.5					Minimum Non-Detect	-0.693
1548					Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693
1549												
1550												
1551					**Warning: There are only 5 Detected Values in this data**							
1552					**Note: It should be noted that even though bootstrap may be performed on this data set**							
1553					**the resulting calculations may not be reliable enough tp draw conclusions**							
1554												
1555					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
1556												
1557												
1558					**UCL Statistics**							
1559					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
1560					Shapiro Wilk Test Statistic	0.966					Shapiro Wilk Test Statistic	0.915
1561					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
1562					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
1563												
1564					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1565					DL/2 Substitution Method						DL/2 Substitution Method	
1566					Mean	0.541					Mean	-0.698
1567					SD	0.223					SD	0.468
1568					95% DL/2 (t) UCL	0.725					95% H-Stat (DL/2) UCL	0.678
1569												
1570					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
1571					Mean	0.576					Mean in Log Scale	-0.649
1572					SD	0.169					SD in Log Scale	0.39
1573					95% MLE (t) UCL	0.714					Mean in Original Scale	0.555
1574					95% MLE (Tiku) UCL	0.726					SD in Original Scale	0.203
1575											95% Percentile Bootstrap UCL	0.68
1576											95% BCA Bootstrap UCL	0.682
1577												
1578					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
1579					k star (bias corrected)	4.336					**Data appear Normal at 5% Significance Level**	
1580					Theta Star	0.138						
1581					nu star	43.36						
1582												
1583					A-D Test Statistic	0.308					**Nonparametric Statistics**	
1584					5% A-D Critical Value	0.679					Kaplan-Meier (KM) Method	
1585					K-S Test Statistic	0.679					Mean	0.553
1586					5% K-S Critical Value	0.358					SD	0.188
1587					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.086
1588											95% KM (t) UCL	0.726
1589					**Assuming Gamma Distribution**						95% KM (z) UCL	0.694
1590					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.737

1591					Minimum	0.32				95% KM (bootstrap t) UCL		0.714
1592					Maximum	0.835				95% KM (BCA) UCL		0.724
1593					Mean	0.57				95% KM (Percentile Bootstrap) UCL		0.702
1594					Median	0.565				95% KM (Chebyshev) UCL		0.927
1595					SD	0.186				97.5% KM (Chebyshev) UCL		1.09
1596					k star	5.416				99% KM (Chebyshev) UCL		1.408
1597					Theta star	0.105						
1598					Nu star	64.99				**Potential UCLs to Use**		
1599					AppChi2	47.44				95% KM (t) UCL		0.726
1600				95% Gamma Approximate UCL		0.781				95% KM (Percentile Bootstrap) UCL		0.702
1601				95% Adjusted Gamma UCL		0.88						
1602	**Note: DL/2 is not a recommended method.**											
1603												
1604												
1605	**Fluoride (mw-27-20)**											
1606												
1607	**General Statistics**											
1608					Number of Valid Data	5				Number of Detected Data		4
1609					Number of Distinct Detected Data	4				Number of Non-Detect Data		1
1610										Percent Non-Detects		20.00%
1611												
1612	**Raw Statistics**						**Log-transformed Statistics**					
1613					Minimum Detected	0.46				Minimum Detected		-0.777
1614					Maximum Detected	0.68				Maximum Detected		-0.386
1615					Mean of Detected	0.59				Mean of Detected		-0.539
1616					SD of Detected	0.0983				SD of Detected		0.175
1617					Minimum Non-Detect	0.5				Minimum Non-Detect		-0.693
1618					Maximum Non-Detect	0.5				Maximum Non-Detect		-0.693
1619												
1620												
1621	**Warning: There are only 4 Distinct Detected Values in this data**											
1622	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1623	**the resulting calculations may not be reliable enough tp draw conclusions**											
1624												
1625	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1626												
1627												
1628	**UCL Statistics**											
1629	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1630					Shapiro Wilk Test Statistic	0.934				Shapiro Wilk Test Statistic		0.916
1631					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value		0.748
1632	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1633												
1634	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1635					DL/2 Substitution Method					DL/2 Substitution Method		
1636					Mean	0.522				Mean		-0.708
1637					SD	0.174				SD		0.408
1638					95% DL/2 (t) UCL	0.688				95% H-Stat (DL/2) UCL		0.672
1639												
1640				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
1641					Mean	0.634				Mean in Log Scale		-0.585
1642					SD	0.0464				SD in Log Scale		0.183
1643					95% MLE (t) UCL	0.678				Mean in Original Scale		0.565

1644				95% MLE (Tiku) UCL	0.691					SD in Original Scale	0.102	
1645										95% Percentile Bootstrap UCL	0.631	
1646										95% BCA Bootstrap UCL	0.631	
1647												
1648	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
1649				k star (bias corrected)	11.43					**Data appear Normal at 5% Significance Level**		
1650				Theta Star	0.0516							
1651				nu star	91.43							
1652												
1653				A-D Test Statistic	0.321					**Nonparametric Statistics**		
1654				5% A-D Critical Value	0.656					Kaplan-Meier (KM) Method		
1655				K-S Test Statistic	0.656					Mean	0.564	
1656				5% K-S Critical Value	0.394					SD	0.0922	
1657	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.0476	
1658										95% KM (t) UCL	0.666	
1659	**Assuming Gamma Distribution**									95% KM (z) UCL	0.642	
1660				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.673	
1661				Minimum	0.46					95% KM (bootstrap t) UCL	0.629	
1662				Maximum	0.68					95% KM (BCA) UCL	0.662	
1663				Mean	0.575					95% KM (Percentile Bootstrap) UCL	0.656	
1664				Median	0.57					95% KM (Chebyshev) UCL	0.772	
1665				SD	0.0914					97.5% KM (Chebyshev) UCL	0.861	
1666				k star	19.57					99% KM (Chebyshev) UCL	1.038	
1667				Theta star	0.0294							
1668				Nu star	195.7					**Potential UCLs to Use**		
1669				AppChi2	164.3					95% KM (t) UCL	0.666	
1670				95% Gamma Approximate UCL	0.685					95% KM (Percentile Bootstrap) UCL	0.656	
1671				95% Adjusted Gamma UCL	N/A							
1672	**Note: DL/2 is not a recommended method.**											
1673												
1674												
1675	**Fluoride (mw-27-60)**											
1676												
1677	**General Statistics**											
1678				Number of Valid Data	2					Number of Detected Data	0	
1679				Number of Distinct Detected Data	0					Number of Non-Detect Data	2	
1680										Percent Non-Detects	100.00%	
1681												
1682	**Warning: This data set only has 2 observations!**											
1683	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1684	**The data set for variable Fluoride (mw-27-60) was not processed!**											
1685												
1686	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1687	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1688												
1689												
1690												
1691	**Fluoride (mw-27-85)**											
1692												
1693	**General Statistics**											
1694				Number of Valid Data	2					Number of Detected Data	0	
1695				Number of Distinct Detected Data	0					Number of Non-Detect Data	2	
1696										Percent Non-Detects	100.00%	

1697												
1698	Warning: This data set only has 2 observations!											
1699	Data set is too small to compute reliable and meaningful statistics and estimates!											
1700	The data set for variable Fluoride (mw-27-85) was not processed!											
1701												
1702	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1703	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1704												
1705												
1706												
1707	Fluoride (mw-28-25)											
1708												
1709	General Statistics											
1710						Number of Valid Data	7			Number of Detected Data	6	
1711						Number of Distinct Detected Data	6			Number of Non-Detect Data	1	
1712										Percent Non-Detects	14.29%	
1713												
1714						Raw Statistics				Log-transformed Statistics		
1715						Minimum Detected	0.05			Minimum Detected	-2.996	
1716						Maximum Detected	0.68			Maximum Detected	-0.386	
1717						Mean of Detected	0.457			Mean of Detected	-1.085	
1718						SD of Detected	0.264			SD of Detected	1.041	
1719						Minimum Non-Detect	0.5			Minimum Non-Detect	-0.693	
1720						Maximum Non-Detect	0.5			Maximum Non-Detect	-0.693	
1721												
1722												
1723	Warning: There are only 6 Detected Values in this data											
1724	Note: It should be noted that even though bootstrap may be performed on this data set											
1725	the resulting calculations may not be reliable enough tp draw conclusions											
1726												
1727	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
1728												
1729												
1730	UCL Statistics											
1731						Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only		
1732						Shapiro Wilk Test Statistic	0.806			Shapiro Wilk Test Statistic	0.742	
1733						5% Shapiro Wilk Critical Value	0.788			5% Shapiro Wilk Critical Value	0.788	
1734						Data appear Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level		
1735												
1736						Assuming Normal Distribution				Assuming Lognormal Distribution		
1737						DL/2 Substitution Method				DL/2 Substitution Method		
1738						Mean	0.427			Mean	-1.128	
1739						SD	0.253			SD	0.958	
1740						95% DL/2 (t) UCL	0.613			95% H-Stat (DL/2) UCL	1.906	
1741												
1742						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		
1743						Mean	0.622			Mean in Log Scale	-1.233	
1744						SD	0.0396			SD in Log Scale	1.029	
1745						95% MLE (t) UCL	0.651			Mean in Original Scale	0.408	
1746						95% MLE (Tiku) UCL	0.661			SD in Original Scale	0.272	
1747										95% Percentile Bootstrap UCL	0.558	
1748										95% BCA Bootstrap UCL	0.557	
1749												

1750	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
1751					k star (bias corrected)	1.016		**Data appear Normal at 5% Significance Level**				
1752					Theta Star	0.449						
1753					nu star	12.19						
1754												
1755					A-D Test Statistic	0.799		**Nonparametric Statistics**				
1756					5% A-D Critical Value	0.706				Kaplan-Meier (KM) Method		
1757					K-S Test Statistic	0.706				Mean		0.409
1758					5% K-S Critical Value	0.336				SD		0.253
1759	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.106
1760										95% KM (t) UCL		0.614
1761	**Assuming Gamma Distribution**									95% KM (z) UCL		0.583
1762					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.616
1763					Minimum	0.05				95% KM (bootstrap t) UCL		0.58
1764					Maximum	0.68				95% KM (BCA) UCL		0.614
1765					Mean	0.431				95% KM (Percentile Bootstrap) UCL		0.608
1766					Median	0.57				95% KM (Chebyshev) UCL		0.869
1767					SD	0.249				97.5% KM (Chebyshev) UCL		1.069
1768					k star	1.237				99% KM (Chebyshev) UCL		1.46
1769					Theta star	0.349						
1770					Nu star	17.31		**Potential UCLs to Use**				
1771					AppChi2	8.896				95% KM (t) UCL		0.614
1772					95% Gamma Approximate UCL	0.84				95% KM (Percentile Bootstrap) UCL		0.608
1773					95% Adjusted Gamma UCL	1.045						
1774	**Note: DL/2 is not a recommended method.**											
1775												
1776												
1777	**Fluoride (mw-28-90)**											
1778												
1779	**General Statistics**											
1780					Number of Valid Data	3				Number of Detected Data		2
1781					Number of Distinct Detected Data	2				Number of Non-Detect Data		1
1782										Percent Non-Detects		33.33%
1783												
1784	**Warning: This data set only has 3 observations!**											
1785	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1786	**The data set for variable Fluoride (mw-28-90) was not processed!**											
1787												
1788	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1789	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1790												
1791												
1792												
1793	**Fluoride (mw-29)**											
1794												
1795	**General Statistics**											
1796					Number of Valid Observations	4				Number of Distinct Observations		4
1797												
1798												
1799	**Warning: This data set only has 4 observations!**											
1800	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1801	**The data set for variable Fluoride (mw-29) was not processed!**											
1802												

1803	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1804	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1805												
1806												
1807												
1808	Fluoride (mw-3)											
1809												
1810	General Statistics											
1811					Number of Valid Observations	6				Number of Distinct Observations	6	
1812												
1813					Raw Statistics					Log-transformed Statistics		
1814					Minimum	2.78				Minimum of Log Data	1.022	
1815					Maximum	3.85				Maximum of Log Data	1.348	
1816					Mean	3.205				Mean of log Data	1.159	
1817					Median	3.075				SD of log Data	0.117	
1818					SD	0.388						
1819					Coefficient of Variation	0.121						
1820					Skewness	0.996						
1821												
1822												
1823	Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!											
1824												
1825	It is suggested to collect at least 8 to 10 observations using these statistical methods!											
1826	If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1827												
1828												
1829	Warning: There are only 6 Values in this data											
1830	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
1831	the resulting calculations may not be reliable enough to draw conclusions											
1832												
1833	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
1834												
1835	Relevant UCL Statistics											
1836					Normal Distribution Test					Lognormal Distribution Test		
1837					Shapiro Wilk Test Statistic	0.915				Shapiro Wilk Test Statistic	0.934	
1838					Shapiro Wilk Critical Value	0.788				Shapiro Wilk Critical Value	0.788	
1839					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
1840												
1841					Assuming Normal Distribution					Assuming Lognormal Distribution		
1842					95% Student's-t UCL	3.524				95% H-UCL	3.556	
1843					95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL	3.874	
1844					95% Adjusted-CLT UCL	3.534				97.5% Chebyshev (MVUE) UCL	4.163	
1845					95% Modified-t UCL	3.535				99% Chebyshev (MVUE) UCL	4.732	
1846												
1847					Gamma Distribution Test					Data Distribution		
1848					k star (bias corrected)	42.9				Data appear Normal at 5% Significance Level		
1849					Theta Star	0.0747						
1850					nu star	514.8						
1851					Approximate Chi Square Value (.05)	463.1				Nonparametric Statistics		
1852					Adjusted Level of Significance	0.0122				95% CLT UCL	3.466	
1853					Adjusted Chi Square Value	445.3				95% Jackknife UCL	3.524	
1854										95% Standard Bootstrap UCL	3.44	
1855					Anderson-Darling Test Statistic	0.344				95% Bootstrap-t UCL	3.945	

1856				Anderson-Darling 5% Critical Value	0.696					95% Hall's Bootstrap UCL	5.904	
1857				Kolmogorov-Smirnov Test Statistic	0.273					95% Percentile Bootstrap UCL	3.458	
1858				Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	3.483	
1859				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	3.895	
1860										97.5% Chebyshev(Mean, Sd) UCL	4.194	
1861				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	4.781	
1862				95% Approximate Gamma UCL	3.562							
1863				95% Adjusted Gamma UCL	3.705							
1864												
1865				**Potential UCL to Use**						Use 95% Student's-t UCL	3.524	
1866												
1867												
1868	**Fluoride (mw-30-30)**											
1869												
1870				**General Statistics**								
1871				Number of Valid Data	5					Number of Detected Data	3	
1872				Number of Distinct Detected Data	3					Number of Non-Detect Data	2	
1873										Percent Non-Detects	40.00%	
1874												
1875				**Raw Statistics**						**Log-transformed Statistics**		
1876				Minimum Detected	1.1					Minimum Detected	0.0953	
1877				Maximum Detected	1.5					Maximum Detected	0.405	
1878				Mean of Detected	1.267					Mean of Detected	0.228	
1879				SD of Detected	0.208					SD of Detected	0.16	
1880				Minimum Non-Detect	2					Minimum Non-Detect	0.693	
1881				Maximum Non-Detect	12.5					Maximum Non-Detect	2.526	
1882												
1883	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	5	
1884	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1885	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1886												
1887	**Warning: There are only 3 Distinct Detected Values in this data set**											
1888	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1889	**Those methods will return a 'N/A' value on your output display!**											
1890												
1891	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1892	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1893												
1894												
1895				**UCL Statistics**								
1896				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
1897				Shapiro Wilk Test Statistic	0.923					Shapiro Wilk Test Statistic	0.94	
1898				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
1899				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
1900												
1901				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
1902				DL/2 Substitution Method						DL/2 Substitution Method		
1903				Mean	2.21					Mean	0.503	
1904				SD	2.266					SD	0.758	
1905				95% DL/2 (t) UCL	4.371					95% H-Stat (DL/2) UCL	9.639	
1906												
1907				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1908				**MLE method failed to converge properly**						Mean in Log Scale	0.228	

1909											SD in Log Scale	0.113
1910											Mean in Original Scale	1.262
1911											SD in Original Scale	0.147
1912											95% Percentile Bootstrap UCL	1.36
1913											95% BCA Bootstrap UCL	1.371
1914												
1915	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1916					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
1917					Theta Star	N/A						
1918					nu star	N/A						
1919												
1920					A-D Test Statistic	0.339	**Nonparametric Statistics**					
1921					5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method					
1922					K-S Test Statistic	N/A	Mean	1.267				
1923					5% K-S Critical Value	N/A	SD	0.17				
1924	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.12				
1925							95% KM (t) UCL	1.523				
1926	**Assuming Gamma Distribution**						95% KM (z) UCL	1.464				
1927	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.547				
1928					Minimum	N/A	95% KM (bootstrap t) UCL	1.948				
1929					Maximum	N/A	95% KM (BCA) UCL	1.44				
1930					Mean	N/A	95% KM (Percentile Bootstrap) UCL	1.5				
1931					Median	N/A	95% KM (Chebyshev) UCL	1.791				
1932					SD	N/A	97.5% KM (Chebyshev) UCL	2.017				
1933					k star	N/A	99% KM (Chebyshev) UCL	2.462				
1934					Theta star	N/A						
1935					Nu star	N/A	**Potential UCLs to Use**					
1936					AppChi2	N/A	95% KM (t) UCL	1.523				
1937					95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	1.5				
1938					95% Adjusted Gamma UCL	N/A						
1939	**Warning: Recommended UCL exceeds the maximum observation**											
1940	**Note: DL/2 is not a recommended method.**											
1941												
1942												
1943	**Fluoride (mw-30-50)**											
1944												
1945	**General Statistics**											
1946					Number of Valid Data	2	Number of Detected Data	0				
1947					Number of Distinct Detected Data	0	Number of Non-Detect Data	2				
1948							Percent Non-Detects	100.00%				
1949												
1950	**Warning: This data set only has 2 observations!**											
1951	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1952	**The data set for variable Fluoride (mw-30-50) was not processed!**											
1953												
1954	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1955	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1956												
1957												
1958												
1959	**Fluoride (mw-31-135)**											
1960												
1961	**General Statistics**											

1962					Number of Valid Observations	3				Number of Distinct Observations	3	
1963												
1964												
1965						Warning: This data set only has 3 observations!						
1966						Data set is too small to compute reliable and meaningful statistics and estimates!						
1967						The data set for variable Fluoride (mw-31-135) was not processed!						
1968												
1969						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
1970						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
1971												
1972												
1973												
1974	Fluoride (mw-31-60)											
1975												
1976						General Statistics						
1977					Number of Valid Observations	6				Number of Distinct Observations	6	
1978												
1979					Raw Statistics					Log-transformed Statistics		
1980					Minimum	2				Minimum of Log Data	0.693	
1981					Maximum	3.46				Maximum of Log Data	1.241	
1982					Mean	2.62				Mean of log Data	0.949	
1983					Median	2.53				SD of log Data	0.182	
1984					SD	0.489						
1985					Coefficient of Variation	0.187						
1986					Skewness	0.885						
1987												
1988												
1989						Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!						
1990												
1991						It is suggested to collect at least 8 to 10 observations using these statistical methods!						
1992						If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
1993												
1994												
1995						Warning: There are only 6 Values in this data						
1996						Note: It should be noted that even though bootstrap methods may be performed on this data set,						
1997						the resulting calculations may not be reliable enough to draw conclusions						
1998												
1999						The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.						
2000												
2001						Relevant UCL Statistics						
2002					Normal Distribution Test					Lognormal Distribution Test		
2003					Shapiro Wilk Test Statistic	0.945				Shapiro Wilk Test Statistic	0.971	
2004					Shapiro Wilk Critical Value	0.788				Shapiro Wilk Critical Value	0.788	
2005					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
2006												
2007					Assuming Normal Distribution					Assuming Lognormal Distribution		
2008					95% Student's-t UCL	3.022				95% H-UCL	3.101	
2009					95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL	3.467	
2010					95% Adjusted-CLT UCL	3.026				97.5% Chebyshev (MVUE) UCL	3.833	
2011					95% Modified-t UCL	3.034				99% Chebyshev (MVUE) UCL	4.553	
2012												
2013					Gamma Distribution Test					Data Distribution		
2014					k star (bias corrected)	18.08				Data appear Normal at 5% Significance Level		

2015					Theta Star	0.145						
2016					nu star	216.9						
2017					Approximate Chi Square Value (.05)	183.9				Nonparametric Statistics		
2018					Adjusted Level of Significance	0.0122				95% CLT UCL	2.949	
2019					Adjusted Chi Square Value	172.8				95% Jackknife UCL	3.022	
2020										95% Standard Bootstrap UCL	2.928	
2021					Anderson-Darling Test Statistic	0.249				95% Bootstrap-t UCL	3.133	
2022					Anderson-Darling 5% Critical Value	0.697				95% Hall's Bootstrap UCL	5.1	
2023					Kolmogorov-Smirnov Test Statistic	0.163				95% Percentile Bootstrap UCL	2.93	
2024					Kolmogorov-Smirnov 5% Critical Value	0.332				95% BCA Bootstrap UCL	2.987	
2025					**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	3.491	
2026										97.5% Chebyshev(Mean, Sd) UCL	3.867	
2027					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	4.607	
2028					95% Approximate Gamma UCL	3.092						
2029					95% Adjusted Gamma UCL	3.289						
2030												
2031					**Potential UCL to Use**					Use 95% Student's-t UCL	3.022	
2032												
2033												
2034	**Fluoride (mw-32-20)**											
2035												
2036					**General Statistics**							
2037					Number of Valid Data	3				Number of Detected Data	0	
2038					Number of Distinct Detected Data	0				Number of Non-Detect Data	3	
2039										Percent Non-Detects	100.00%	
2040												
2041					**Warning: This data set only has 3 observations!**							
2042					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
2043					**The data set for variable Fluoride (mw-32-20) was not processed!**							
2044												
2045					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
2046					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
2047												
2048												
2049												
2050	**Fluoride (mw-32-35)**											
2051												
2052					**General Statistics**							
2053					Number of Valid Data	3				Number of Detected Data	0	
2054					Number of Distinct Detected Data	0				Number of Non-Detect Data	3	
2055										Percent Non-Detects	100.00%	
2056												
2057					**Warning: This data set only has 3 observations!**							
2058					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
2059					**The data set for variable Fluoride (mw-32-35) was not processed!**							
2060												
2061					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
2062					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
2063												
2064												
2065												
2066	**Fluoride (mw-33-150)**											
2067												

	A	B	C	D	E	F	G	H	I	J	K	L
2068	**General Statistics**											
2069					Number of Valid Data	3				Number of Detected Data		0
2070					Number of Distinct Detected Data	0				Number of Non-Detect Data		3
2071										Percent Non-Detects		100.00%
2072												
2073	**Warning: This data set only has 3 observations!**											
2074	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2075	**The data set for variable Fluoride (mw-33-150) was not processed!**											
2076												
2077	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2078	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2079												
2080												
2081												
2082	**Fluoride (mw-33-210)**											
2083												
2084	**General Statistics**											
2085					Number of Valid Data	4				Number of Detected Data		0
2086					Number of Distinct Detected Data	0				Number of Non-Detect Data		4
2087										Percent Non-Detects		100.00%
2088												
2089	**Warning: This data set only has 4 observations!**											
2090	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2091	**The data set for variable Fluoride (mw-33-210) was not processed!**											
2092												
2093	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2094	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2095												
2096												
2097												
2098	**Fluoride (mw-33-40)**											
2099												
2100	**General Statistics**											
2101					Number of Valid Observations	3				Number of Distinct Observations		3
2102												
2103												
2104	**Warning: This data set only has 3 observations!**											
2105	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2106	**The data set for variable Fluoride (mw-33-40) was not processed!**											
2107												
2108	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2109	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2110												
2111												
2112												
2113	**Fluoride (mw-33-90)**											
2114												
2115	**General Statistics**											
2116					Number of Valid Observations	4				Number of Distinct Observations		4
2117												
2118												
2119	**Warning: This data set only has 4 observations!**											
2120	**Data set is too small to compute reliable and meaningful statistics and estimates!**											

	A	B	C	D	E	F	G	H	I	J	K	L
2121	The data set for variable Fluoride (mw-33-90) was not processed!											
2122												
2123	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2124	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2125												
2126												
2127												
2128	Fluoride (mw-34-100)											
2129												
2130	General Statistics											
2131					Number of Valid Data	4			Number of Detected Data			2
2132					Number of Distinct Detected Data	2			Number of Non-Detect Data			2
2133									Percent Non-Detects			50.00%
2134												
2135	Warning: This data set only has 4 observations!											
2136	Data set is too small to compute reliable and meaningful statistics and estimates!											
2137	The data set for variable Fluoride (mw-34-100) was not processed!											
2138												
2139	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2140	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2141												
2142												
2143												
2144	Fluoride (mw-34-55)											
2145												
2146	General Statistics											
2147					Number of Valid Data	3			Number of Detected Data			1
2148					Number of Distinct Detected Data	1			Number of Non-Detect Data			2
2149									Percent Non-Detects			66.67%
2150												
2151	Warning: This data set only has 3 observations!											
2152	Data set is too small to compute reliable and meaningful statistics and estimates!											
2153	The data set for variable Fluoride (mw-34-55) was not processed!											
2154												
2155	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2156	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2157												
2158												
2159												
2160	Fluoride (mw-34-80)											
2161												
2162	General Statistics											
2163					Number of Valid Data	3			Number of Detected Data			1
2164					Number of Distinct Detected Data	1			Number of Non-Detect Data			2
2165									Percent Non-Detects			66.67%
2166												
2167	Warning: This data set only has 3 observations!											
2168	Data set is too small to compute reliable and meaningful statistics and estimates!											
2169	The data set for variable Fluoride (mw-34-80) was not processed!											
2170												
2171	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2172	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2173												

	A	B	C	D	E	F	G	H	I	J	K	L
2174												
2175												
2176	**Fluoride (mw-35-135)**											
2177												
2178	**General Statistics**											
2179					Number of Valid Data	4			Number of Detected Data			3
2180					Number of Distinct Detected Data	3			Number of Non-Detect Data			1
2181									Percent Non-Detects			25.00%
2182												
2183	**Warning: This data set only has 4 observations!**											
2184	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2185	**The data set for variable Fluoride (mw-35-135) was not processed!**											
2186												
2187	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2188	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2189												
2190												
2191												
2192	**Fluoride (mw-35-60)**											
2193												
2194	**General Statistics**											
2195					Number of Valid Observations	3			Number of Distinct Observations			3
2196												
2197												
2198	**Warning: This data set only has 3 observations!**											
2199	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2200	**The data set for variable Fluoride (mw-35-60) was not processed!**											
2201												
2202	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2203	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2204												
2205												
2206												
2207	**Fluoride (mw-36-100)**											
2208												
2209	**General Statistics**											
2210					Number of Valid Observations	1			Number of Distinct Observations			1
2211												
2212												
2213	**Warning: This data set only has 1 observations!**											
2214	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2215	**The data set for variable Fluoride (mw-36-100) was not processed!**											
2216												
2217	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2218	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2219												
2220												
2221												
2222	**Fluoride (mw-36-20)**											
2223												
2224	**General Statistics**											
2225					Number of Valid Observations	2			Number of Distinct Observations			2
2226												

	A	B	C	D	E	F	G	H	I	J	K	L
2227												
2228	Warning: This data set only has 2 observations!											
2229	Data set is too small to compute reliable and meaningful statistics and estimates!											
2230	The data set for variable Fluoride (mw-36-20) was not processed!											
2231												
2232	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2233	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2234												
2235												
2236												
2237	Fluoride (mw-36-40)											
2238												
2239	General Statistics											
2240	Number of Valid Observations	1				Number of Distinct Observations	1					
2241												
2242												
2243	Warning: This data set only has 1 observations!											
2244	Data set is too small to compute reliable and meaningful statistics and estimates!											
2245	The data set for variable Fluoride (mw-36-40) was not processed!											
2246												
2247	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2248	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2249												
2250												
2251												
2252	Fluoride (mw-36-50)											
2253												
2254	General Statistics											
2255	Number of Valid Observations	1				Number of Distinct Observations	1					
2256												
2257												
2258	Warning: This data set only has 1 observations!											
2259	Data set is too small to compute reliable and meaningful statistics and estimates!											
2260	The data set for variable Fluoride (mw-36-50) was not processed!											
2261												
2262	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2263	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2264												
2265												
2266												
2267	Fluoride (mw-36-70)											
2268												
2269	General Statistics											
2270	Number of Valid Observations	2				Number of Distinct Observations	2					
2271												
2272												
2273	Warning: This data set only has 2 observations!											
2274	Data set is too small to compute reliable and meaningful statistics and estimates!											
2275	The data set for variable Fluoride (mw-36-70) was not processed!											
2276												
2277	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2278	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2279												

	A	B	C	D	E	F	G	H	I	J	K	L
2280												
2281												
2282	**Fluoride (mw-36-90)**											
2283												
2284	**General Statistics**											
2285	Number of Valid Observations					1	Number of Distinct Observations					1
2286												
2287												
2288	**Warning: This data set only has 1 observations!**											
2289	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2290	**The data set for variable Fluoride (mw-36-90) was not processed!**											
2291												
2292	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2293	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2294												
2295												
2296												
2297	**Fluoride (mw-37d)**											
2298												
2299	**General Statistics**											
2300	Number of Valid Observations					2	Number of Distinct Observations					2
2301												
2302												
2303	**Warning: This data set only has 2 observations!**											
2304	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2305	**The data set for variable Fluoride (mw-37d) was not processed!**											
2306												
2307	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2308	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2309												
2310												
2311												
2312	**Fluoride (mw-37s)**											
2313												
2314	**General Statistics**											
2315	Number of Valid Observations					2	Number of Distinct Observations					2
2316												
2317												
2318	**Warning: This data set only has 2 observations!**											
2319	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2320	**The data set for variable Fluoride (mw-37s) was not processed!**											
2321												
2322	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2323	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2324												
2325												
2326												
2327	**Fluoride (mw-38d)**											
2328												
2329	**General Statistics**											
2330	Number of Valid Observations					2	Number of Distinct Observations					2
2331												
2332												

	A	B	C	D	E	F	G	H	I	J	K	L
2333	Warning: This data set only has 2 observations!											
2334	Data set is too small to compute reliable and meaningful statistics and estimates!											
2335	The data set for variable Fluoride (mw-38d) was not processed!											
2336												
2337	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2338	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2339												
2340												
2341												
2342	Fluoride (mw-38s)											
2343												
2344	General Statistics											
2345					Number of Valid Observations	2			Number of Distinct Observations	2		
2346												
2347												
2348	Warning: This data set only has 2 observations!											
2349	Data set is too small to compute reliable and meaningful statistics and estimates!											
2350	The data set for variable Fluoride (mw-38s) was not processed!											
2351												
2352	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2353	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2354												
2355												
2356												
2357	Fluoride (mw-39-100)											
2358												
2359	General Statistics											
2360					Number of Valid Data	2			Number of Detected Data	1		
2361					Number of Distinct Detected Data	1			Number of Non-Detect Data	1		
2362									Percent Non-Detects	50.00%		
2363												
2364	Warning: This data set only has 2 observations!											
2365	Data set is too small to compute reliable and meaningful statistics and estimates!											
2366	The data set for variable Fluoride (mw-39-100) was not processed!											
2367												
2368	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2369	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2370												
2371												
2372												
2373	Fluoride (mw-39-40)											
2374												
2375	General Statistics											
2376					Number of Valid Observations	2			Number of Distinct Observations	2		
2377												
2378												
2379	Warning: This data set only has 2 observations!											
2380	Data set is too small to compute reliable and meaningful statistics and estimates!											
2381	The data set for variable Fluoride (mw-39-40) was not processed!											
2382												
2383	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2384	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2385												

	A	B	C	D	E	F	G	H	I	J	K	L
2386												
2387												
2388	**Fluoride (mw-39-50)**											
2389												
2390	**General Statistics**											
2391	Number of Valid Observations					1	Number of Distinct Observations					1
2392												
2393												
2394	**Warning: This data set only has 1 observations!**											
2395	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2396	**The data set for variable Fluoride (mw-39-50) was not processed!**											
2397												
2398	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2399	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2400												
2401												
2402												
2403	**Fluoride (mw-39-60)**											
2404												
2405	**General Statistics**											
2406	Number of Valid Observations					2	Number of Distinct Observations					2
2407												
2408												
2409	**Warning: This data set only has 2 observations!**											
2410	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2411	**The data set for variable Fluoride (mw-39-60) was not processed!**											
2412												
2413	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2414	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2415												
2416												
2417												
2418	**Fluoride (mw-39-70)**											
2419												
2420	**General Statistics**											
2421	Number of Valid Observations					2	Number of Distinct Observations					2
2422												
2423												
2424	**Warning: This data set only has 2 observations!**											
2425	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2426	**The data set for variable Fluoride (mw-39-70) was not processed!**											
2427												
2428	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2429	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2430												
2431												
2432												
2433	**Fluoride (mw-39-80)**											
2434												
2435	**General Statistics**											
2436	Number of Valid Observations					1	Number of Distinct Observations					1
2437												
2438												

2439	Warning: This data set only has 1 observations!											
2440	Data set is too small to compute reliable and meaningful statistics and estimates!											
2441	The data set for variable Fluoride (mw-39-80) was not processed!											
2442												
2443	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2444	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2445												
2446												
2447												
2448	Fluoride (mw-4)											
2449												
2450	General Statistics											
2451			Number of Valid Observations	6			Number of Distinct Observations	6				
2452												
2453			Raw Statistics				Log-transformed Statistics					
2454			Minimum	1.73			Minimum of Log Data	0.548				
2455			Maximum	3.01			Maximum of Log Data	1.102				
2456			Mean	2.25			Mean of log Data	0.795				
2457			Median	2.2			SD of log Data	0.193				
2458			SD	0.449								
2459			Coefficient of Variation	0.2								
2460			Skewness	0.889								
2461												
2462												
2463	Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!											
2464												
2465	It is suggested to collect at least 8 to 10 observations using these statistical methods!											
2466	If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2467												
2468												
2469	Warning: There are only 6 Values in this data											
2470	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
2471	the resulting calculations may not be reliable enough to draw conclusions											
2472												
2473	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
2474												
2475	Relevant UCL Statistics											
2476			Normal Distribution Test				Lognormal Distribution Test					
2477			Shapiro Wilk Test Statistic	0.955			Shapiro Wilk Test Statistic	0.983				
2478			Shapiro Wilk Critical Value	0.788			Shapiro Wilk Critical Value	0.788				
2479			Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level					
2480												
2481			Assuming Normal Distribution				Assuming Lognormal Distribution					
2482			95% Student's-t UCL	2.619			95% H-UCL	2.696				
2483			95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	3.023				
2484			95% Adjusted-CLT UCL	2.623			97.5% Chebyshev (MVUE) UCL	3.358				
2485			95% Modified-t UCL	2.63			99% Chebyshev (MVUE) UCL	4.016				
2486												
2487			Gamma Distribution Test				Data Distribution					
2488			k star (bias corrected)	15.94			Data appear Normal at 5% Significance Level					
2489			Theta Star	0.141								
2490			nu star	191.3								
2491			Approximate Chi Square Value (.05)	160.3			Nonparametric Statistics					

2492					Adjusted Level of Significance	0.0122					95% CLT UCL	2.551
2493					Adjusted Chi Square Value	150					95% Jackknife UCL	2.619
2494											95% Standard Bootstrap UCL	2.52
2495					Anderson-Darling Test Statistic	0.189					95% Bootstrap-t UCL	2.753
2496					Anderson-Darling 5% Critical Value	0.697					95% Hall's Bootstrap UCL	2.916
2497					Kolmogorov-Smirnov Test Statistic	0.143					95% Percentile Bootstrap UCL	2.527
2498					Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	2.602
2499					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	3.049
2500											97.5% Chebyshev(Mean, Sd) UCL	3.395
2501					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	4.074
2502					95% Approximate Gamma UCL	2.685						
2503					95% Adjusted Gamma UCL	2.869						
2504												
2505					**Potential UCL to Use**						Use 95% Student's-t UCL	2.619
2506												
2507												
2508	**Fluoride (mw-40d)**											
2509												
2510					**General Statistics**							
2511					Number of Valid Observations	2					Number of Distinct Observations	2
2512												
2513												
2514					**Warning: This data set only has 2 observations!**							
2515					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
2516					**The data set for variable Fluoride (mw-40d) was not processed!**							
2517												
2518					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
2519					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
2520												
2521												
2522												
2523	**Fluoride (mw-40s)**											
2524												
2525					**General Statistics**							
2526					Number of Valid Observations	2					Number of Distinct Observations	2
2527												
2528												
2529					**Warning: This data set only has 2 observations!**							
2530					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
2531					**The data set for variable Fluoride (mw-40s) was not processed!**							
2532												
2533					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
2534					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
2535												
2536												
2537												
2538	**Fluoride (mw-41d)**											
2539												
2540					**General Statistics**							
2541					Number of Valid Data	2					Number of Detected Data	0
2542					Number of Distinct Detected Data	0					Number of Non-Detect Data	2
2543											Percent Non-Detects	100.00%
2544												

	A	B	C	D	E	F	G	H	I	J	K	L
2545	Warning: This data set only has 2 observations!											
2546	Data set is too small to compute reliable and meaningful statistics and estimates!											
2547	The data set for variable Fluoride (mw-41d) was not processed!											
2548												
2549	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2550	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2551												
2552												
2553												
2554	Fluoride (mw-41m)											
2555												
2556	General Statistics											
2557						Number of Valid Data	1			Number of Detected Data	0	
2558						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
2559										Percent Non-Detects	100.00%	
2560												
2561	Warning: This data set only has 1 observations!											
2562	Data set is too small to compute reliable and meaningful statistics and estimates!											
2563	The data set for variable Fluoride (mw-41m) was not processed!											
2564												
2565	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2566	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2567												
2568												
2569												
2570	Fluoride (mw-41s)											
2571												
2572	General Statistics											
2573						Number of Valid Observations	2			Number of Distinct Observations	2	
2574												
2575												
2576	Warning: This data set only has 2 observations!											
2577	Data set is too small to compute reliable and meaningful statistics and estimates!											
2578	The data set for variable Fluoride (mw-41s) was not processed!											
2579												
2580	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2581	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2582												
2583												
2584												
2585	Fluoride (mw-42-30)											
2586												
2587	General Statistics											
2588						Number of Valid Data	2			Number of Detected Data	0	
2589						Number of Distinct Detected Data	0			Number of Non-Detect Data	2	
2590										Percent Non-Detects	100.00%	
2591												
2592	Warning: This data set only has 2 observations!											
2593	Data set is too small to compute reliable and meaningful statistics and estimates!											
2594	The data set for variable Fluoride (mw-42-30) was not processed!											
2595												
2596	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2597	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											

	A	B	C	D	E	F	G	H	I	J	K	L
2598												
2599												
2600												
2601	**Fluoride (mw-42-55)**											
2602												
2603	**General Statistics**											
2604					Number of Valid Data	2			Number of Detected Data			0
2605					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
2606									Percent Non-Detects			100.00%
2607												
2608	**Warning: This data set only has 2 observations!**											
2609	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2610	**The data set for variable Fluoride (mw-42-55) was not processed!**											
2611												
2612	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2613	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2614												
2615												
2616												
2617	**Fluoride (mw-42-65)**											
2618												
2619	**General Statistics**											
2620					Number of Valid Data	2			Number of Detected Data			0
2621					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
2622									Percent Non-Detects			100.00%
2623												
2624	**Warning: This data set only has 2 observations!**											
2625	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2626	**The data set for variable Fluoride (mw-42-65) was not processed!**											
2627												
2628	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2629	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2630												
2631												
2632												
2633	**Fluoride (mw-43-25)**											
2634												
2635	**General Statistics**											
2636					Number of Valid Data	2			Number of Detected Data			1
2637					Number of Distinct Detected Data	1			Number of Non-Detect Data			1
2638									Percent Non-Detects			50.00%
2639												
2640	**Warning: This data set only has 2 observations!**											
2641	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2642	**The data set for variable Fluoride (mw-43-25) was not processed!**											
2643												
2644	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2645	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2646												
2647												
2648												
2649	**Fluoride (mw-43-75)**											
2650												

	A	B	C	D	E	F	G	H	I	J	K	L
2651	General Statistics											
2652					Number of Valid Data	2				Number of Detected Data		1
2653					Number of Distinct Detected Data	1				Number of Non-Detect Data		1
2654										Percent Non-Detects		50.00%
2655												
2656	Warning: This data set only has 2 observations!											
2657	Data set is too small to compute reliable and meaningful statistics and estimates!											
2658	The data set for variable Fluoride (mw-43-75) was not processed!											
2659												
2660	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2661	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2662												
2663												
2664												
2665	Fluoride (mw-43-90)											
2666												
2667	General Statistics											
2668					Number of Valid Data	2				Number of Detected Data		1
2669					Number of Distinct Detected Data	1				Number of Non-Detect Data		1
2670										Percent Non-Detects		50.00%
2671												
2672	Warning: This data set only has 2 observations!											
2673	Data set is too small to compute reliable and meaningful statistics and estimates!											
2674	The data set for variable Fluoride (mw-43-90) was not processed!											
2675												
2676	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2677	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2678												
2679												
2680												
2681	Fluoride (mw-44-125)											
2682												
2683	General Statistics											
2684					Number of Valid Observations	1				Number of Distinct Observations		1
2685												
2686												
2687	Warning: This data set only has 1 observations!											
2688	Data set is too small to compute reliable and meaningful statistics and estimates!											
2689	The data set for variable Fluoride (mw-44-125) was not processed!											
2690												
2691	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2692	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2693												
2694												
2695												
2696	Fluoride (mw-45-095a)											
2697												
2698	General Statistics											
2699					Number of Valid Observations	1				Number of Distinct Observations		1
2700												
2701												
2702	Warning: This data set only has 1 observations!											
2703	Data set is too small to compute reliable and meaningful statistics and estimates!											

	A	B	C	D	E	F	G	H	I	J	K	L
2704	The data set for variable Fluoride (mw-45-095a) was not processed!											
2705												
2706	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2707	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2708												
2709												
2710												
2711	Fluoride (mw-46-175)											
2712												
2713	General Statistics											
2714	Number of Valid Observations	1				Number of Distinct Observations	1					
2715												
2716												
2717	Warning: This data set only has 1 observations!											
2718	Data set is too small to compute reliable and meaningful statistics and estimates!											
2719	The data set for variable Fluoride (mw-46-175) was not processed!											
2720												
2721	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2722	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2723												
2724												
2725												
2726	Fluoride (mw-47-55)											
2727												
2728	General Statistics											
2729	Number of Valid Observations	1				Number of Distinct Observations	1					
2730												
2731												
2732	Warning: This data set only has 1 observations!											
2733	Data set is too small to compute reliable and meaningful statistics and estimates!											
2734	The data set for variable Fluoride (mw-47-55) was not processed!											
2735												
2736	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2737	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2738												
2739												
2740												
2741	Fluoride (mw-5)											
2742												
2743	General Statistics											
2744	Number of Valid Observations	6				Number of Distinct Observations	6					
2745												
2746	Raw Statistics					Log-transformed Statistics						
2747	Minimum	4.73				Minimum of Log Data	1.554					
2748	Maximum	6.6				Maximum of Log Data	1.887					
2749	Mean	5.602				Mean of log Data	1.715					
2750	Median	5.555				SD of log Data	0.141					
2751	SD	0.789										
2752	Coefficient of Variation	0.141										
2753	Skewness	0.129										
2754												
2755												
2756	Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!											

2757												
2758	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
2759	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2760												
2761												
2762	**Warning: There are only 6 Values in this data**											
2763	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
2764	**the resulting calculations may not be reliable enough to draw conclusions**											
2765												
2766	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
2767												
2768	**Relevant UCL Statistics**											
2769	**Normal Distribution Test**						**Lognormal Distribution Test**					
2770			Shapiro Wilk Test Statistic	0.868					Shapiro Wilk Test Statistic	0.866		
2771			Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788		
2772	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2773												
2774	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2775			95% Student's-t UCL	6.251					95% H-UCL	6.361		
2776	**95% UCLs (Adjusted for Skewness)**								95% Chebyshev (MVUE) UCL	7.007		
2777			95% Adjusted-CLT UCL	6.15					97.5% Chebyshev (MVUE) UCL	7.616		
2778			95% Modified-t UCL	6.253					99% Chebyshev (MVUE) UCL	8.81		
2779												
2780	**Gamma Distribution Test**						**Data Distribution**					
2781			k star (bias corrected)	30.38			**Data appear Normal at 5% Significance Level**					
2782			Theta Star	0.184								
2783			nu star	364.5								
2784			Approximate Chi Square Value (.05)	321.3			**Nonparametric Statistics**					
2785			Adjusted Level of Significance	0.0122					95% CLT UCL	6.131		
2786			Adjusted Chi Square Value	306.5					95% Jackknife UCL	6.251		
2787									95% Standard Bootstrap UCL	6.089		
2788			Anderson-Darling Test Statistic	0.532					95% Bootstrap-t UCL	6.346		
2789			Anderson-Darling 5% Critical Value	0.697					95% Hall's Bootstrap UCL	5.917		
2790			Kolmogorov-Smirnov Test Statistic	0.291					95% Percentile Bootstrap UCL	6.112		
2791			Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	6.112		
2792	**Data appear Gamma Distributed at 5% Significance Level**								95% Chebyshev(Mean, Sd) UCL	7.006		
2793									97.5% Chebyshev(Mean, Sd) UCL	7.613		
2794	**Assuming Gamma Distribution**								99% Chebyshev(Mean, Sd) UCL	8.806		
2795			95% Approximate Gamma UCL	6.356								
2796			95% Adjusted Gamma UCL	6.662								
2797												
2798	**Potential UCL to Use**								Use 95% Student's-t UCL	6.251		
2799												
2800												
2801	**Fluoride (mw-6)**											
2802												
2803	**General Statistics**											
2804			Number of Valid Observations	6					Number of Distinct Observations	6		
2805												
2806	**Raw Statistics**						**Log-transformed Statistics**					
2807			Minimum	6.87					Minimum of Log Data	1.927		
2808			Maximum	8.6					Maximum of Log Data	2.152		
2809			Mean	7.897					Mean of log Data	2.063		

2810					Median	8.11					SD of log Data	0.0908
2811					SD	0.7						
2812					Coefficient of Variation	0.0886						
2813					Skewness	-0.685						
2814												
2815												
2816	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
2817												
2818	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
2819	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2820												
2821												
2822	**Warning: There are only 6 Values in this data**											
2823	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
2824	**the resulting calculations may not be reliable enough to draw conclusions**											
2825												
2826	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
2827												
2828	**Relevant UCL Statistics**											
2829	**Normal Distribution Test**						**Lognormal Distribution Test**					
2830	Shapiro Wilk Test Statistic	0.901					Shapiro Wilk Test Statistic	0.893				
2831	Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788				
2832	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2833												
2834	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2835	95% Student's-t UCL	8.472					95% H-UCL	N/A				
2836	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	9.173				
2837	95% Adjusted-CLT UCL	8.281					97.5% Chebyshev (MVUE) UCL	9.725				
2838	95% Modified-t UCL	8.459					99% Chebyshev (MVUE) UCL	10.81				
2839												
2840	**Gamma Distribution Test**						**Data Distribution**					
2841	k star (bias corrected)	74.15					**Data appear Normal at 5% Significance Level**					
2842	Theta Star	0.107										
2843	nu star	889.7										
2844	Approximate Chi Square Value (.05)	821.5					**Nonparametric Statistics**					
2845	Adjusted Level of Significance	0.0122					95% CLT UCL	8.367				
2846	Adjusted Chi Square Value	797.5					95% Jackknife UCL	8.472				
2847							95% Standard Bootstrap UCL	8.327				
2848	Anderson-Darling Test Statistic	0.399					95% Bootstrap-t UCL	8.414				
2849	Anderson-Darling 5% Critical Value	0.696					95% Hall's Bootstrap UCL	8.21				
2850	Kolmogorov-Smirnov Test Statistic	0.238					95% Percentile Bootstrap UCL	8.323				
2851	Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	8.273				
2852	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	9.142				
2853							97.5% Chebyshev(Mean, Sd) UCL	9.681				
2854	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	10.74				
2855	95% Approximate Gamma UCL	8.553										
2856	95% Adjusted Gamma UCL	8.81										
2857												
2858	**Potential UCL to Use**						Use 95% Student's-t UCL	8.472				
2859												
2860												
2861	**Fluoride (mw-7)**											
2862												

2863	**General Statistics**											
2864	Number of Valid Observations				6	Number of Distinct Observations						6
2865												
2866	**Raw Statistics**					**Log-transformed Statistics**						
2867	Minimum				3.78	Minimum of Log Data						1.33
2868	Maximum				5.07	Maximum of Log Data						1.623
2869	Mean				4.372	Mean of log Data						1.469
2870	Median				4.45	SD of log Data						0.118
2871	SD				0.513							
2872	Coefficient of Variation				0.117							
2873	Skewness				-0.0278							
2874												
2875												
2876	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
2877												
2878	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
2879	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2880												
2881												
2882	**Warning: There are only 6 Values in this data**											
2883	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
2884	**the resulting calculations may not be reliable enough to draw conclusions**											
2885												
2886	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
2887												
2888	**Relevant UCL Statistics**											
2889	**Normal Distribution Test**					**Lognormal Distribution Test**						
2890	Shapiro Wilk Test Statistic				0.923	Shapiro Wilk Test Statistic						0.915
2891	Shapiro Wilk Critical Value				0.788	Shapiro Wilk Critical Value						0.788
2892	**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**						
2893												
2894	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
2895	95% Student's-t UCL				4.794	95% H-UCL						4.856
2896	**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL						5.293
2897	95% Adjusted-CLT UCL				4.714	97.5% Chebyshev (MVUE) UCL						5.691
2898	95% Modified-t UCL				4.793	99% Chebyshev (MVUE) UCL						6.474
2899												
2900	**Gamma Distribution Test**					**Data Distribution**						
2901	k star (bias corrected)				43.26	**Data appear Normal at 5% Significance Level**						
2902	Theta Star				0.101							
2903	nu star				519.1							
2904	Approximate Chi Square Value (.05)				467.3	**Nonparametric Statistics**						
2905	Adjusted Level of Significance				0.0122	95% CLT UCL						4.716
2906	Adjusted Chi Square Value				449.3	95% Jackknife UCL						4.794
2907						95% Standard Bootstrap UCL						4.68
2908	Anderson-Darling Test Statistic				0.339	95% Bootstrap-t UCL						4.775
2909	Anderson-Darling 5% Critical Value				0.696	95% Hall's Bootstrap UCL						4.671
2910	Kolmogorov-Smirnov Test Statistic				0.225	95% Percentile Bootstrap UCL						4.702
2911	Kolmogorov-Smirnov 5% Critical Value				0.332	95% BCA Bootstrap UCL						4.657
2912	**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL						5.285
2913						97.5% Chebyshev(Mean, Sd) UCL						5.68
2914	**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL						6.456
2915	95% Approximate Gamma UCL				4.857							

2916					95% Adjusted Gamma UCL	5.051						
2917												
2918					**Potential UCL to Use**						Use 95% Student's-t UCL	4.794
2919												
2920												
2921	**Fluoride (mw-8)**											
2922												
2923					**General Statistics**							
2924					Number of Valid Observations	6					Number of Distinct Observations	6
2925												
2926					**Raw Statistics**						**Log-transformed Statistics**	
2927					Minimum	0.868					Minimum of Log Data	-0.142
2928					Maximum	1.5					Maximum of Log Data	0.405
2929					Mean	1.168					Mean of log Data	0.139
2930					Median	1.17					SD of log Data	0.196
2931					SD	0.226						
2932					Coefficient of Variation	0.194						
2933					Skewness	0.187						
2934												
2935												
2936					**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**							
2937												
2938					**It is suggested to collect at least 8 to 10 observations using these statistical methods!**							
2939					**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
2940												
2941												
2942					**Warning: There are only 6 Values in this data**							
2943					**Note: It should be noted that even though bootstrap methods may be performed on this data set,**							
2944					**the resulting calculations may not be reliable enough to draw conclusions**							
2945												
2946					**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**							
2947												
2948					**Relevant UCL Statistics**							
2949					**Normal Distribution Test**						**Lognormal Distribution Test**	
2950					Shapiro Wilk Test Statistic	0.989					Shapiro Wilk Test Statistic	0.99
2951					Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788
2952					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
2953												
2954					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2955					95% Student's-t UCL	1.354					95% H-UCL	1.404
2956					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	1.575
2957					95% Adjusted-CLT UCL	1.327					97.5% Chebyshev (MVUE) UCL	1.752
2958					95% Modified-t UCL	1.355					99% Chebyshev (MVUE) UCL	2.098
2959												
2960					**Gamma Distribution Test**						**Data Distribution**	
2961					k star (bias corrected)	15.97					**Data appear Normal at 5% Significance Level**	
2962					Theta Star	0.0731						
2963					nu star	191.7						
2964					Approximate Chi Square Value (.05)	160.6					**Nonparametric Statistics**	
2965					Adjusted Level of Significance	0.0122					95% CLT UCL	1.32
2966					Adjusted Chi Square Value	150.3					95% Jackknife UCL	1.354
2967											95% Standard Bootstrap UCL	1.307
2968					Anderson-Darling Test Statistic	0.159					95% Bootstrap-t UCL	1.36

2969			Anderson-Darling 5% Critical Value	0.697				95% Hall's Bootstrap UCL	1.326			
2970			Kolmogorov-Smirnov Test Statistic	0.155				95% Percentile Bootstrap UCL	1.308			
2971			Kolmogorov-Smirnov 5% Critical Value	0.332				95% BCA Bootstrap UCL	1.313			
2972			**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	1.57			
2973								97.5% Chebyshev(Mean, Sd) UCL	1.745			
2974			**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	2.087			
2975			95% Approximate Gamma UCL	1.394								
2976			95% Adjusted Gamma UCL	1.489								
2977												
2978			**Potential UCL to Use**					Use 95% Student's-t UCL	1.354			
2979												
2980												
2981	**Fluoride (mw-9)**											
2982												
2983					**General Statistics**							
2984			Number of Valid Data	6				Number of Detected Data	3			
2985			Number of Distinct Detected Data	2				Number of Non-Detect Data	3			
2986								Percent Non-Detects	50.00%			
2987												
2988			**Raw Statistics**					**Log-transformed Statistics**				
2989			Minimum Detected	0.18				Minimum Detected	-1.715			
2990			Maximum Detected	0.2				Maximum Detected	-1.609			
2991			Mean of Detected	0.193				Mean of Detected	-1.645			
2992			SD of Detected	0.0115				SD of Detected	0.0608			
2993			Minimum Non-Detect	0.1				Minimum Non-Detect	-2.303			
2994			Maximum Non-Detect	0.5				Maximum Non-Detect	-0.693			
2995												
2996	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect	6			
2997	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected	0			
2998	Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	100.00%			
2999												
3000					**Warning: Data set has only 2 Distinct Detected Values.**							
3001					**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**							
3002					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
3003												
3004					**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**							
3005												
3006					**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**							
3007					**Those methods will return a 'N/A' value on your output display!**							
3008												
3009					**It is necessary to have 4 or more Distinct Values for bootstrap methods.**							
3010					**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**							
3011												
3012												
3013					**UCL Statistics**							
3014			**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**				
3015			Shapiro Wilk Test Statistic	0.75				Shapiro Wilk Test Statistic	0.75			
3016			5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value	0.767			
3017			**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**				
3018												
3019			**Assuming Normal Distribution**					**Assuming Lognormal Distribution**				
3020			DL/2 Substitution Method					DL/2 Substitution Method				
3021			Mean	0.163				Mean	-1.936			

3022				SD	0.0739					SD	0.604	
3023				95% DL/2 (t) UCL	0.224					95% H-Stat (DL/2) UCL	0.379	
3024												
3025				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3026				**MLE method failed to converge properly**						Mean in Log Scale	-1.692	
3027										SD in Log Scale	0.0711	
3028										Mean in Original Scale	0.185	
3029										SD in Original Scale	0.0132	
3030										95% Percentile Bootstrap UCL	0.193	
3031										95% BCA Bootstrap UCL	0.193	
3032												
3033				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
3034				k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**		
3035				Theta Star	N/A							
3036				nu star	N/A							
3037												
3038				A-D Test Statistic	0.619					**Nonparametric Statistics**		
3039				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
3040				K-S Test Statistic	N/A					Mean	0.188	
3041				5% K-S Critical Value	N/A					SD	0.0098	
3042				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00537	
3043										95% KM (t) UCL	0.199	
3044				**Assuming Gamma Distribution**						95% KM (z) UCL	0.197	
3045				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.202	
3046				Minimum	N/A					95% KM (bootstrap t) UCL	0.193	
3047				Maximum	N/A					95% KM (BCA) UCL	N/A	
3048				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.2	
3049				Median	N/A					95% KM (Chebyshev) UCL	0.211	
3050				SD	N/A					97.5% KM (Chebyshev) UCL	0.222	
3051				k star	N/A					99% KM (Chebyshev) UCL	0.241	
3052				Theta star	N/A							
3053				Nu star	N/A					**Potential UCLs to Use**		
3054				AppChi2	N/A					95% KM (t) UCL	0.199	
3055				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.2	
3056				95% Adjusted Gamma UCL	N/A							
3057	**Note: DL/2 is not a recommended method.**											
3058												
3059												
3060	**Fluoride (ow-1d)**											
3061												
3062						**General Statistics**							
3063				Number of Valid Data	16					Number of Detected Data	15	
3064				Number of Distinct Detected Data	15					Number of Non-Detect Data	1	
3065										Percent Non-Detects	6.25%	
3066												
3067				**Raw Statistics**						**Log-transformed Statistics**		
3068				Minimum Detected	1.14					Minimum Detected	0.131	
3069				Maximum Detected	3.91					Maximum Detected	1.364	
3070				Mean of Detected	2.478					Mean of Detected	0.821	
3071				SD of Detected	1.008					SD of Detected	0.443	
3072				Minimum Non-Detect	0.5					Minimum Non-Detect	-0.693	
3073				Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693	
3074												

3075												
3076	**UCL Statistics**											
3077	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3078				Shapiro Wilk Test Statistic	0.906					Shapiro Wilk Test Statistic	0.903	
3079				5% Shapiro Wilk Critical Value	0.881					5% Shapiro Wilk Critical Value	0.881	
3080	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3081												
3082	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3083				DL/2 Substitution Method						DL/2 Substitution Method		
3084				Mean	2.339					Mean	0.683	
3085				SD	1.122					SD	0.698	
3086				95% DL/2 (t) UCL	2.83					95% H-Stat (DL/2) UCL	3.089	
3087												
3088				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
3089				Mean	2.325					Mean in Log Scale	0.755	
3090				SD	1.118					SD in Log Scale	0.504	
3091				95% MLE (t) UCL	2.815					Mean in Original Scale	2.372	
3092				95% MLE (Tiku) UCL	2.82					SD in Original Scale	1.062	
3093										95% Percentile Bootstrap UCL	2.809	
3094										95% BCA Bootstrap UCL	2.792	
3095												
3096	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3097				k star (bias corrected)	4.817		**Data appear Normal at 5% Significance Level**					
3098				Theta Star	0.514							
3099				nu star	144.5							
3100												
3101				A-D Test Statistic	0.481		**Nonparametric Statistics**					
3102				5% A-D Critical Value	0.738					Kaplan-Meier (KM) Method		
3103				K-S Test Statistic	0.738					Mean	2.394	
3104				5% K-S Critical Value	0.222					SD	0.997	
3105	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.258	
3106										95% KM (t) UCL	2.847	
3107	**Assuming Gamma Distribution**									95% KM (z) UCL	2.819	
3108				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	2.845	
3109				Minimum	0.296					95% KM (bootstrap t) UCL	2.844	
3110				Maximum	3.91					95% KM (BCA) UCL	2.822	
3111				Mean	2.342					95% KM (Percentile Bootstrap) UCL	2.816	
3112				Median	2.33					95% KM (Chebyshev) UCL	3.519	
3113				SD	1.116					97.5% KM (Chebyshev) UCL	4.005	
3114				k star	2.758					99% KM (Chebyshev) UCL	4.961	
3115				Theta star	0.849							
3116				Nu star	88.26		**Potential UCLs to Use**					
3117				AppChi2	67.6					95% KM (t) UCL	2.847	
3118				95% Gamma Approximate UCL	3.057					95% KM (Percentile Bootstrap) UCL	2.816	
3119				95% Adjusted Gamma UCL	3.153							
3120	**Note: DL/2 is not a recommended method.**											
3121												
3122												
3123	**Fluoride (ow-1m)**											
3124												
3125	**General Statistics**											
3126				Number of Valid Observations	16					Number of Distinct Observations	14	
3127												

	A	B	C	D	E	F	G	H	I	J	K	L
3128	**Raw Statistics**						**Log-transformed Statistics**					
3129					Minimum	0.693					Minimum of Log Data	-0.367
3130					Maximum	2.41					Maximum of Log Data	0.88
3131					Mean	1.875					Mean of log Data	0.584
3132					Median	2.015					SD of log Data	0.34
3133					SD	0.478						
3134					Coefficient of Variation	0.255						
3135					Skewness	-1.472						
3136												
3137	**Relevant UCL Statistics**											
3138	**Normal Distribution Test**						**Lognormal Distribution Test**					
3139					Shapiro Wilk Test Statistic	0.84					Shapiro Wilk Test Statistic	0.73
3140					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
3141	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3142												
3143	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3144					95% Student's-t UCL	2.084					95% H-UCL	2.245
3145	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	2.604
3146					95% Adjusted-CLT UCL	2.025					97.5% Chebyshev (MVUE) UCL	2.912
3147					95% Modified-t UCL	2.077					99% Chebyshev (MVUE) UCL	3.517
3148												
3149	**Gamma Distribution Test**						**Data Distribution**					
3150					k star (bias corrected)	9.342	**Data do not follow a Discernable Distribution (0.05)**					
3151					Theta Star	0.201						
3152					nu star	298.9						
3153					Approximate Chi Square Value (.05)	259.9	**Nonparametric Statistics**					
3154					Adjusted Level of Significance	0.0335					95% CLT UCL	2.072
3155					Adjusted Chi Square Value	255.7					95% Jackknife UCL	2.084
3156											95% Standard Bootstrap UCL	2.061
3157					Anderson-Darling Test Statistic	1.501					95% Bootstrap-t UCL	2.044
3158					Anderson-Darling 5% Critical Value	0.739					95% Hall's Bootstrap UCL	2.039
3159					Kolmogorov-Smirnov Test Statistic	0.257					95% Percentile Bootstrap UCL	2.053
3160					Kolmogorov-Smirnov 5% Critical Value	0.215					95% BCA Bootstrap UCL	2.03
3161	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	2.396
3162											97.5% Chebyshev(Mean, Sd) UCL	2.622
3163	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	3.065
3164					95% Approximate Gamma UCL	2.157						
3165					95% Adjusted Gamma UCL	2.191						
3166												
3167	**Potential UCL to Use**										Use 95% Student's-t UCL	2.084
3168											or 95% Modified-t UCL	2.077
3169												
3170												
3171	**Fluoride (ow-1s)**											
3172												
3173	**General Statistics**											
3174					Number of Valid Observations	14					Number of Distinct Observations	14
3175												
3176	**Raw Statistics**						**Log-transformed Statistics**					
3177					Minimum	2.04					Minimum of Log Data	0.713
3178					Maximum	2.74					Maximum of Log Data	1.008
3179					Mean	2.371					Mean of log Data	0.86
3180					Median	2.385					SD of log Data	0.0844

SD	0.199	
Coefficient of Variation	0.0838	
Skewness	-0.0342	

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.978	Shapiro Wilk Test Statistic	0.975
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.466	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.605
95% Adjusted-CLT UCL	2.458	97.5% Chebyshev (MVUE) UCL	2.706
95% Modified-t UCL	2.465	99% Chebyshev (MVUE) UCL	2.904

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	119.6	**Data appear Normal at 5% Significance Level**	
Theta Star	0.0198		
nu star	3348		
Approximate Chi Square Value (.05)	3215	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	2.459
Adjusted Chi Square Value	3197	95% Jackknife UCL	2.466
		95% Standard Bootstrap UCL	2.454
Anderson-Darling Test Statistic	0.208	95% Bootstrap-t UCL	2.462
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	2.456
Kolmogorov-Smirnov Test Statistic	0.11	95% Percentile Bootstrap UCL	2.456
Kolmogorov-Smirnov 5% Critical Value	0.228	95% BCA Bootstrap UCL	2.454
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.603
		97.5% Chebyshev(Mean, Sd) UCL	2.703
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.9
95% Approximate Gamma UCL	2.47		
95% Adjusted Gamma UCL	2.483		
Potential UCL to Use		Use 95% Student's-t UCL	2.466

Fluoride (ow-2d)

General Statistics

Number of Valid Data	15	Number of Detected Data	14
Number of Distinct Detected Data	11	Number of Non-Detect Data	1
		Percent Non-Detects	6.67%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.966	Minimum Detected	-0.0346
Maximum Detected	2.38	Maximum Detected	0.867
Mean of Detected	1.731	Mean of Detected	0.526
SD of Detected	0.358	SD of Detected	0.229
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

	A	B	C	D	E	F	G	H	I	J	K	L
3234	**UCL Statistics**											
3235	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3236					Shapiro Wilk Test Statistic	0.935					Shapiro Wilk Test Statistic	0.883
3237					5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874
3238	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3239												
3240	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3241					DL/2 Substitution Method						DL/2 Substitution Method	
3242					Mean	1.632					Mean	0.399
3243					SD	0.515					SD	0.541
3244					95% DL/2 (t) UCL	1.867					95% H-Stat (DL/2) UCL	1.936
3245												
3246					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
3247					Mean	1.638					Mean in Log Scale	0.492
3248					SD	0.483					SD in Log Scale	0.258
3249					95% MLE (t) UCL	1.858					Mean in Original Scale	1.683
3250					95% MLE (Tiku) UCL	1.865					SD in Original Scale	0.392
3251											95% Percentile Bootstrap UCL	1.833
3252											95% BCA Bootstrap UCL	1.843
3253												
3254	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3255					k star (bias corrected)	17.6	**Data appear Normal at 5% Significance Level**					
3256					Theta Star	0.0983						
3257					nu star	492.9						
3258												
3259					A-D Test Statistic	0.668	**Nonparametric Statistics**					
3260					5% A-D Critical Value	0.734					Kaplan-Meier (KM) Method	
3261					K-S Test Statistic	0.734					Mean	1.68
3262					5% K-S Critical Value	0.228					SD	0.384
3263	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.103
3264											95% KM (t) UCL	1.862
3265	**Assuming Gamma Distribution**										95% KM (z) UCL	1.85
3266					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.861
3267					Minimum	0.91					95% KM (bootstrap t) UCL	1.857
3268					Maximum	2.38					95% KM (BCA) UCL	1.866
3269					Mean	1.676					95% KM (Percentile Bootstrap) UCL	1.86
3270					Median	1.71					95% KM (Chebyshev) UCL	2.129
3271					SD	0.405					97.5% KM (Chebyshev) UCL	2.323
3272					k star	12.76					99% KM (Chebyshev) UCL	2.705
3273					Theta star	0.131						
3274					Nu star	382.9	**Potential UCLs to Use**					
3275					AppChi2	338.6					95% KM (t) UCL	1.862
3276					95% Gamma Approximate UCL	1.896					95% KM (Percentile Bootstrap) UCL	1.86
3277					95% Adjusted Gamma UCL	1.925						
3278	**Note: DL/2 is not a recommended method.**											
3279												
3280												
3281	**Fluoride (ow-2m)**											
3282												
3283	**General Statistics**											
3284					Number of Valid Data	15					Number of Detected Data	14
3285					Number of Distinct Detected Data	13					Number of Non-Detect Data	1
3286											Percent Non-Detects	6.67%

3287												
3288	**Raw Statistics**						**Log-transformed Statistics**					
3289					Minimum Detected	0.991					Minimum Detected	-0.00904
3290					Maximum Detected	2.29					Maximum Detected	0.829
3291					Mean of Detected	1.904					Mean of Detected	0.627
3292					SD of Detected	0.322					SD of Detected	0.206
3293					Minimum Non-Detect	0.5					Minimum Non-Detect	-0.693
3294					Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693
3295												
3296												
3297	**UCL Statistics**											
3298	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3299					Shapiro Wilk Test Statistic	0.84					Shapiro Wilk Test Statistic	0.734
3300					5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874
3301	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3302												
3303	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3304					DL/2 Substitution Method						DL/2 Substitution Method	
3305					Mean	1.793					Mean	0.492
3306					SD	0.528					SD	0.556
3307					95% DL/2 (t) UCL	2.033					95% H-Stat (DL/2) UCL	2.184
3308												
3309					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
3310					Mean	1.8					Mean in Log Scale	0.599
3311					SD	0.492					SD in Log Scale	0.225
3312					95% MLE (t) UCL	2.024					Mean in Original Scale	1.859
3313					95% MLE (Tiku) UCL	2.031					SD in Original Scale	0.355
3314											95% Percentile Bootstrap UCL	1.991
3315											95% BCA Bootstrap UCL	1.973
3316												
3317	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3318					k star (bias corrected)	23.07	**Data do not follow a Discernable Distribution (0.05)**					
3319					Theta Star	0.0825						
3320					nu star	646.1						
3321												
3322					A-D Test Statistic	1.049	**Nonparametric Statistics**					
3323					5% A-D Critical Value	0.734	Kaplan-Meier (KM) Method					
3324					K-S Test Statistic	0.734	Mean					1.843
3325					5% K-S Critical Value	0.228	SD					0.376
3326	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.101
3327							95% KM (t) UCL					2.02
3328	**Assuming Gamma Distribution**						95% KM (z) UCL					2.009
3329					Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL					2.03
3330					Minimum	0.991	95% KM (bootstrap t) UCL					1.987
3331					Maximum	2.29	95% KM (BCA) UCL					2.022
3332					Mean	1.853	95% KM (Percentile Bootstrap) UCL					2.009
3333					Median	1.88	95% KM (Chebyshev) UCL					2.282
3334					SD	0.367	97.5% KM (Chebyshev) UCL					2.473
3335					k star	17.54	99% KM (Chebyshev) UCL					2.846
3336					Theta star	0.106						
3337					Nu star	526.3	**Potential UCLs to Use**					
3338					AppChi2	474.1	95% KM (Chebyshev) UCL					2.282
3339					95% Gamma Approximate UCL	2.057						

3340					95% Adjusted Gamma UCL	2.084						
3341	**Note: DL/2 is not a recommended method.**											
3342												
3343												
3344	**Fluoride (ow-2s)**											
3345												
3346						**General Statistics**							
3347						Number of Valid Observations	14				Number of Distinct Observations	14
3348												
3349						**Raw Statistics**					**Log-transformed Statistics**	
3350						Minimum	3.5				Minimum of Log Data	1.253
3351						Maximum	5.23				Maximum of Log Data	1.654
3352						Mean	4.281				Mean of log Data	1.446
3353						Median	4.27				SD of log Data	0.133
3354						SD	0.571					
3355						Coefficient of Variation	0.133					
3356						Skewness	0.188					
3357												
3358						**Relevant UCL Statistics**							
3359						**Normal Distribution Test**					**Lognormal Distribution Test**	
3360						Shapiro Wilk Test Statistic	0.936				Shapiro Wilk Test Statistic	0.939
3361						Shapiro Wilk Critical Value	0.874				Shapiro Wilk Critical Value	0.874
3362						**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**	
3363												
3364						**Assuming Normal Distribution**					**Assuming Lognormal Distribution**	
3365						95% Student's-t UCL	4.551				95% H-UCL	4.574
3366						**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL	4.946
3367						95% Adjusted-CLT UCL	4.54				97.5% Chebyshev (MVUE) UCL	5.234
3368						95% Modified-t UCL	4.552				99% Chebyshev (MVUE) UCL	5.8
3369												
3370						**Gamma Distribution Test**					**Data Distribution**	
3371						k star (bias corrected)	47.86				**Data appear Normal at 5% Significance Level**	
3372						Theta Star	0.0894					
3373						nu star	1340					
3374						Approximate Chi Square Value (.05)	1256				**Nonparametric Statistics**	
3375						Adjusted Level of Significance	0.0312				95% CLT UCL	4.532
3376						Adjusted Chi Square Value	1245				95% Jackknife UCL	4.551
3377											95% Standard Bootstrap UCL	4.525
3378						Anderson-Darling Test Statistic	0.381				95% Bootstrap-t UCL	4.563
3379						Anderson-Darling 5% Critical Value	0.733				95% Hall's Bootstrap UCL	4.521
3380						Kolmogorov-Smirnov Test Statistic	0.14				95% Percentile Bootstrap UCL	4.532
3381						Kolmogorov-Smirnov 5% Critical Value	0.228				95% BCA Bootstrap UCL	4.531
3382						**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	4.945
3383											97.5% Chebyshev(Mean, Sd) UCL	5.233
3384						**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	5.798
3385						95% Approximate Gamma UCL	4.567					
3386						95% Adjusted Gamma UCL	4.607					
3387												
3388						**Potential UCL to Use**					Use 95% Student's-t UCL	4.551
3389												
3390												
3391	**Fluoride (ow-3d)**											
3392												

	A	B	C	D	E	F	G	H	I	J	K	L
3393	**General Statistics**											
3394	Number of Valid Observations					1	Number of Distinct Observations					1
3395												
3396												
3397	**Warning: This data set only has 1 observations!**											
3398	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3399	**The data set for variable Fluoride (ow-3d) was not processed!**											
3400												
3401	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3402	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3403												
3404												
3405												
3406	**Fluoride (ow-3m)**											
3407												
3408	**General Statistics**											
3409	Number of Valid Observations					3	Number of Distinct Observations					3
3410												
3411												
3412	**Warning: This data set only has 3 observations!**											
3413	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3414	**The data set for variable Fluoride (ow-3m) was not processed!**											
3415												
3416	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3417	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3418												
3419												
3420												
3421	**Fluoride (ow-3s)**											
3422												
3423	**General Statistics**											
3424	Number of Valid Observations					2	Number of Distinct Observations					2
3425												
3426												
3427	**Warning: This data set only has 2 observations!**											
3428	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3429	**The data set for variable Fluoride (ow-3s) was not processed!**											
3430												
3431	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3432	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3433												
3434												
3435												
3436	**Fluoride (ow-5d)**											
3437												
3438	**General Statistics**											
3439	Number of Valid Data					15	Number of Detected Data					14
3440	Number of Distinct Detected Data					14	Number of Non-Detect Data					1
3441							Percent Non-Detects					6.67%
3442												
3443	**Raw Statistics**						**Log-transformed Statistics**					
3444	Minimum Detected					1.11	Minimum Detected					0.104
3445	Maximum Detected					4.56	Maximum Detected					1.517

3446				Mean of Detected	2.143					Mean of Detected	0.687	
3447				SD of Detected	0.939					SD of Detected	0.387	
3448				Minimum Non-Detect	0.5					Minimum Non-Detect	-0.693	
3449				Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693	
3450												
3451												
3452	**UCL Statistics**											
3453	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3454				Shapiro Wilk Test Statistic	0.845					Shapiro Wilk Test Statistic	0.95	
3455				5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874	
3456	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3457												
3458	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3459				DL/2 Substitution Method						DL/2 Substitution Method		
3460				Mean	2.017					Mean	0.549	
3461				SD	1.028					SD	0.653	
3462				95% DL/2 (t) UCL	2.484					95% H-Stat (DL/2) UCL	2.456	
3463												
3464				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
3465				Mean	2.003					Mean in Log Scale	0.625	
3466				SD	1.024					SD in Log Scale	0.446	
3467				95% MLE (t) UCL	2.469					Mean in Original Scale	2.052	
3468				95% MLE (Tiku) UCL	2.47					SD in Original Scale	0.971	
3469										95% Percentile Bootstrap UCL	2.479	
3470										95% BCA Bootstrap UCL	2.562	
3471												
3472	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3473				k star (bias corrected)	5.437		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
3474				Theta Star	0.394							
3475				nu star	152.2							
3476												
3477				A-D Test Statistic	0.496		**Nonparametric Statistics**					
3478				5% A-D Critical Value	0.737					Kaplan-Meier (KM) Method		
3479				K-S Test Statistic	0.737					Mean	2.074	
3480				5% K-S Critical Value	0.229					SD	0.911	
3481	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean	0.244	
3482										95% KM (t) UCL	2.504	
3483	**Assuming Gamma Distribution**									95% KM (z) UCL	2.476	
3484				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	2.498	
3485				Minimum	0.423					95% KM (bootstrap t) UCL	2.732	
3486				Maximum	4.56					95% KM (BCA) UCL	2.535	
3487				Mean	2.028					95% KM (Percentile Bootstrap) UCL	2.491	
3488				Median	1.86					95% KM (Chebyshev) UCL	3.138	
3489				SD	1.008					97.5% KM (Chebyshev) UCL	3.598	
3490				k star	3.428					99% KM (Chebyshev) UCL	4.503	
3491				Theta star	0.592							
3492				Nu star	102.8		**Potential UCLs to Use**					
3493				AppChi2	80.44					95% KM (BCA) UCL	2.535	
3494				95% Gamma Approximate UCL	2.593							
3495				95% Adjusted Gamma UCL	2.674							
3496	**Note: DL/2 is not a recommended method.**											
3497												
3498												

	A	B	C	D	E	F	G	H	I	J	K	L
3499	Fluoride (ow-5m)											
3500												
3501					General Statistics							
3502					Number of Valid Data	15				Number of Detected Data		14
3503					Number of Distinct Detected Data	14				Number of Non-Detect Data		1
3504										Percent Non-Detects		6.67%
3505												
3506					Raw Statistics					Log-transformed Statistics		
3507					Minimum Detected	1.07				Minimum Detected		0.0677
3508					Maximum Detected	3.97				Maximum Detected		1.379
3509					Mean of Detected	2.536				Mean of Detected		0.86
3510					SD of Detected	0.88				SD of Detected		0.413
3511					Minimum Non-Detect	0.5				Minimum Non-Detect		-0.693
3512					Maximum Non-Detect	0.5				Maximum Non-Detect		-0.693
3513												
3514												
3515					UCL Statistics							
3516					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
3517					Shapiro Wilk Test Statistic	0.933				Shapiro Wilk Test Statistic		0.869
3518					5% Shapiro Wilk Critical Value	0.874				5% Shapiro Wilk Critical Value		0.874
3519					Data appear Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level		
3520												
3521					Assuming Normal Distribution					Assuming Lognormal Distribution		
3522					DL/2 Substitution Method					DL/2 Substitution Method		
3523					Mean	2.383				Mean		0.711
3524					SD	1.033				SD		0.703
3525					95% DL/2 (t) UCL	2.853				95% H-Stat (DL/2) UCL		3.187
3526												
3527					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
3528					Mean	2.373				Mean in Log Scale		0.797
3529					SD	1.025				SD in Log Scale		0.467
3530					95% MLE (t) UCL	2.839				Mean in Original Scale		2.428
3531					95% MLE (Tiku) UCL	2.848				SD in Original Scale		0.946
3532										95% Percentile Bootstrap UCL		2.835
3533										95% BCA Bootstrap UCL		2.777
3534												
3535					Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only		
3536					k star (bias corrected)	5.786				Data appear Normal at 5% Significance Level		
3537					Theta Star	0.438						
3538					nu star	162						
3539												
3540					A-D Test Statistic	0.728				Nonparametric Statistics		
3541					5% A-D Critical Value	0.736				Kaplan-Meier (KM) Method		
3542					K-S Test Statistic	0.736				Mean		2.438
3543					5% K-S Critical Value	0.229				SD		0.897
3544					Data follow Appr. Gamma Distribution at 5% Significance Level					SE of Mean		0.24
3545										95% KM (t) UCL		2.862
3546					Assuming Gamma Distribution					95% KM (z) UCL		2.834
3547					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		2.859
3548					Minimum	0.582				95% KM (bootstrap t) UCL		2.835
3549					Maximum	3.97				95% KM (BCA) UCL		2.847
3550					Mean	2.405				95% KM (Percentile Bootstrap) UCL		2.845
3551					Median	2.72				95% KM (Chebyshev) UCL		3.486

3552					SD	0.987				97.5% KM (Chebyshev) UCL		3.94
3553					k star	3.784				99% KM (Chebyshev) UCL		4.831
3554					Theta star	0.636						
3555					Nu star	113.5				**Potential UCLs to Use**		
3556					AppChi2	89.93				95% KM (t) UCL		2.862
3557					95% Gamma Approximate UCL	3.037				95% KM (Percentile Bootstrap) UCL		2.845
3558					95% Adjusted Gamma UCL	3.126						
3559	**Note: DL/2 is not a recommended method.**											
3560												
3561												
3562	**Fluoride (ow-5s)**											
3563												
3564					**General Statistics**							
3565					Number of Valid Observations	15				Number of Distinct Observations		14
3566												
3567					**Raw Statistics**					**Log-transformed Statistics**		
3568					Minimum	1.69				Minimum of Log Data		0.525
3569					Maximum	2.82				Maximum of Log Data		1.037
3570					Mean	2.312				Mean of log Data		0.83
3571					Median	2.25				SD of log Data		0.131
3572					SD	0.293						
3573					Coefficient of Variation	0.127						
3574					Skewness	-0.28						
3575												
3576					**Relevant UCL Statistics**							
3577					**Normal Distribution Test**					**Lognormal Distribution Test**		
3578					Shapiro Wilk Test Statistic	0.963				Shapiro Wilk Test Statistic		0.948
3579					Shapiro Wilk Critical Value	0.881				Shapiro Wilk Critical Value		0.881
3580					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
3581												
3582					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
3583					95% Student's-t UCL	2.445				95% H-UCL		2.461
3584					**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL		2.654
3585					95% Adjusted-CLT UCL	2.43				97.5% Chebyshev (MVUE) UCL		2.801
3586					95% Modified-t UCL	2.444				99% Chebyshev (MVUE) UCL		3.091
3587												
3588					**Gamma Distribution Test**					**Data Distribution**		
3589					k star (bias corrected)	51.48				**Data appear Normal at 5% Significance Level**		
3590					Theta Star	0.0449						
3591					nu star	1544						
3592					Approximate Chi Square Value (.05)	1454				**Nonparametric Statistics**		
3593					Adjusted Level of Significance	0.0324				95% CLT UCL		2.436
3594					Adjusted Chi Square Value	1443				95% Jackknife UCL		2.445
3595										95% Standard Bootstrap UCL		2.43
3596					Anderson-Darling Test Statistic	0.347				95% Bootstrap-t UCL		2.438
3597					Anderson-Darling 5% Critical Value	0.734				95% Hall's Bootstrap UCL		2.433
3598					Kolmogorov-Smirnov Test Statistic	0.151				95% Percentile Bootstrap UCL		2.437
3599					Kolmogorov-Smirnov 5% Critical Value	0.221				95% BCA Bootstrap UCL		2.427
3600					**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL		2.641
3601										97.5% Chebyshev(Mean, Sd) UCL		2.784
3602					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL		3.064
3603					95% Approximate Gamma UCL	2.456						
3604					95% Adjusted Gamma UCL	2.474						

3605												
3606					Potential UCL to Use						Use 95% Student's-t UCL	2.445
3607												
3608												
3609	Fluoride (pe-1)											
3610												
3611						General Statistics						
3612					Number of Valid Observations	2					Number of Distinct Observations	2
3613												
3614												
3615						Warning: This data set only has 2 observations!						
3616						Data set is too small to compute reliable and meaningful statistics and estimates!						
3617						The data set for variable Fluoride (pe-1) was not processed!						
3618												
3619						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
3620						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
3621												
3622												
3623												
3624	Fluoride (pge-6)											
3625												
3626						General Statistics						
3627					Number of Valid Observations	3					Number of Distinct Observations	3
3628												
3629												
3630						Warning: This data set only has 3 observations!						
3631						Data set is too small to compute reliable and meaningful statistics and estimates!						
3632						The data set for variable Fluoride (pge-6) was not processed!						
3633												
3634						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
3635						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
3636												
3637												
3638												
3639	Fluoride (pge-7)											
3640												
3641						General Statistics						
3642					Number of Valid Observations	2					Number of Distinct Observations	2
3643												
3644												
3645						Warning: This data set only has 2 observations!						
3646						Data set is too small to compute reliable and meaningful statistics and estimates!						
3647						The data set for variable Fluoride (pge-7) was not processed!						
3648												
3649						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
3650						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
3651												
3652												
3653												
3654	Fluoride (pge-8)											
3655												
3656						General Statistics						
3657					Number of Valid Observations	3					Number of Distinct Observations	3

	A	B	C	D	E	F	G	H	I	J	K	L
3658												
3659												
3660						Warning: This data set only has 3 observations!							
3661						Data set is too small to compute reliable and meaningful statistics and estimates!							
3662						The data set for variable Fluoride (pge-8) was not processed!							
3663												
3664						It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
3665						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
3666												
3667												
3668												
3669	Fluoride (tw-2d)											
3670												
3671						General Statistics						
3672					Number of Valid Observations	1			Number of Distinct Observations	1		
3673												
3674												
3675						Warning: This data set only has 1 observations!							
3676						Data set is too small to compute reliable and meaningful statistics and estimates!							
3677						The data set for variable Fluoride (tw-2d) was not processed!							
3678												
3679						It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
3680						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
3681												
3682												
3683												
3684	Fluoride (tw-2s)											
3685												
3686						General Statistics						
3687					Number of Valid Observations	1			Number of Distinct Observations	1		
3688												
3689												
3690						Warning: This data set only has 1 observations!							
3691						Data set is too small to compute reliable and meaningful statistics and estimates!							
3692						The data set for variable Fluoride (tw-2s) was not processed!							
3693												
3694						It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
3695						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
3696												
3697												

1				General UCL Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	Hexavalent chromium (1)											
10												
11						General Statistics						
12					Number of Valid Data	148		Number of Detected Data	110			
13					Number of Distinct Detected Data	83		Number of Non-Detect Data	38			
14								Percent Non-Detects	25.68%			
15												
16					Raw Statistics			Log-transformed Statistics				
17					Minimum Detected	0.00022		Minimum Detected	-8.422			
18					Maximum Detected	0.0376		Maximum Detected	-3.281			
19					Mean of Detected	0.0102		Mean of Detected	-5.066			
20					SD of Detected	0.00844		SD of Detected	1.182			
21					Minimum Non-Detect	0.0002		Minimum Non-Detect	-8.517			
22					Maximum Non-Detect	0.001		Maximum Non-Detect	-6.908			
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect	48			
25	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected	100			
26	Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	32.43%			
27												
28						UCL Statistics						
29					Normal Distribution Test with Detected Values Only			Lognormal Distribution Test with Detected Values Only				
30					Lilliefors Test Statistic	0.148		Lilliefors Test Statistic	0.181			
31					5% Lilliefors Critical Value	0.0845		5% Lilliefors Critical Value	0.0845			
32					Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level				
33												
34					Assuming Normal Distribution			Assuming Lognormal Distribution				
35					DL/2 Substitution Method			DL/2 Substitution Method				
36					Mean	0.00761		Mean	-6.043			
37					SD	0.00848		SD	1.982			
38					95% DL/2 (t) UCL	0.00876		95% H-Stat (DL/2) UCL	0.0145			
39												
40					Maximum Likelihood Estimate(MLE) Method			Log ROS Method				
41					Mean	0.00543		Mean in Log Scale	-5.694			
42					SD	0.0112		SD in Log Scale	1.514			
43					95% MLE (t) UCL	0.00695		Mean in Original Scale	0.00773			
44					95% MLE (Tiku) UCL	0.00706		SD in Original Scale	0.00838			
45								95% Percentile Bootstrap UCL	0.00891			
46								95% BCA Bootstrap UCL	0.00897			
47												
48					Gamma Distribution Test with Detected Values Only			Data Distribution Test with Detected Values Only				
49					k star (bias corrected)	1.158		Data do not follow a Discernable Distribution (0.05)				
50					Theta Star	0.00878						
51					nu star	254.8						
52												
53					A-D Test Statistic	1.093		Nonparametric Statistics				

54				5% A-D Critical Value	0.778					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.778					Mean	0.00762	
56				5% K-S Critical Value	0.0891					SD	0.00844	
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0006973	
58										95% KM (t) UCL	0.00878	
59				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00877	
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00877	
61				Minimum	1E-09					95% KM (bootstrap t) UCL	0.00886	
62				Maximum	0.0376					95% KM (BCA) UCL	0.00877	
63				Mean	0.00812					95% KM (Percentile Bootstrap) UCL	0.00876	
64				Median	0.00564					95% KM (Chebyshev) UCL	0.0107	
65				SD	0.00814					97.5% KM (Chebyshev) UCL	0.012	
66				k star	0.371					99% KM (Chebyshev) UCL	0.0146	
67				Theta star	0.0219							
68				Nu star	109.9					**Potential UCLs to Use**		
69				AppChi2	86.66					95% KM (Chebyshev) UCL	0.0107	
70				95% Gamma Approximate UCL	0.0103							
71				95% Adjusted Gamma UCL	0.0103							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Hexavalent chromium (cw-1d)**											
76												
77					**General Statistics**							
78				Number of Valid Data	8					Number of Detected Data	2	
79				Number of Distinct Detected Data	2					Number of Non-Detect Data	6	
80										Percent Non-Detects	75.00%	
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.0011					Minimum Detected	-6.812	
84				Maximum Detected	0.0012					Maximum Detected	-6.725	
85				Mean of Detected	0.00115					Mean of Detected	-6.769	
86				SD of Detected	7.071E-05					SD of Detected	0.0615	
87				Minimum Non-Detect	0.0002					Minimum Non-Detect	-8.517	
88				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	6	
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	2	
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	75.00%	
93												
94	**Warning: Data set has only 2 Distinct Detected Values.**											
95	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
96	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
97												
98	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
99												
100	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
101	**Those methods will return a 'N/A' value on your output display!**											
102												
103	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
104	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
105												
106												

107	**UCL Statistics**											
108	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
109	Shapiro Wilk Test Statistic				1		Shapiro Wilk Test Statistic					1
110	5% Shapiro Wilk Critical Value				N/A		5% Shapiro Wilk Critical Value					N/A
111	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
112												
113	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
114	DL/2 Substitution Method						DL/2 Substitution Method					
115	Mean				0.0006125		Mean					-7.594
116	SD				0.0003603		SD					0.754
117	95% DL/2 (t) UCL				0.0008539		95% H-Stat (DL/2) UCL					0.00138
118												
119	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
120	**MLE method failed to converge properly**						Mean in Log Scale					N/A
121							SD in Log Scale					N/A
122							Mean in Original Scale					N/A
123							SD in Original Scale					N/A
124							95% Percentile Bootstrap UCL					N/A
125							95% BCA Bootstrap UCL					N/A
126												
127	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
128	k star (bias corrected)				N/A		**Data do not follow a Discernable Distribution (0.05)**					
129	Theta Star				N/A							
130	nu star				N/A							
131												
132	A-D Test Statistic				0.359		**Nonparametric Statistics**					
133	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
134	K-S Test Statistic				N/A		Mean					0.00111
135	5% K-S Critical Value				N/A		SD					3.307E-05
136	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					1.654E-05
137							95% KM (t) UCL					0.00114
138	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00114
139	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00118
140	Minimum				N/A		95% KM (bootstrap t) UCL					0.00111
141	Maximum				N/A		95% KM (BCA) UCL					0.0012
142	Mean				N/A		95% KM (Percentile Bootstrap) UCL					0.0012
143	Median				N/A		95% KM (Chebyshev) UCL					0.00118
144	SD				N/A		97.5% KM (Chebyshev) UCL					0.00122
145	k star				N/A		99% KM (Chebyshev) UCL					0.00128
146	Theta star				N/A							
147	Nu star				N/A		**Potential UCLs to Use**					
148	AppChi2				N/A		95% KM (t) UCL					0.00114
149	95% Gamma Approximate UCL				N/A		95% KM (% Bootstrap) UCL					0.0012
150	95% Adjusted Gamma UCL				N/A							
151	**Note: DL/2 is not a recommended method.**											
152												
153												
154	**Hexavalent chromium (cw-1m)**											
155												
156	**General Statistics**											
157	Number of Valid Observations				8		Number of Distinct Observations					8
158												
159	**Raw Statistics**						**Log-transformed Statistics**					

160					Minimum	0.0039				Minimum of Log Data		-5.547
161					Maximum	0.0181				Maximum of Log Data		-4.012
162					Mean	0.0128				Mean of log Data		-4.459
163					Median	0.0142				SD of log Data		0.531
164					SD	0.00495						
165					Coefficient of Variation	0.387						
166					Skewness	-1.008						
167												
168												
169					Warning: There are only 8 Values in this data							
170					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
171					the resulting calculations may not be reliable enough to draw conclusions							
172												
173					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							
174												
175					Relevant UCL Statistics							
176					Normal Distribution Test					Lognormal Distribution Test		
177					Shapiro Wilk Test Statistic	0.89				Shapiro Wilk Test Statistic		0.797
178					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
179					Data appear Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level		
180												
181					Assuming Normal Distribution					Assuming Lognormal Distribution		
182					95% Student's-t UCL	0.0161				95% H-UCL		0.0216
183					95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL		0.0239
184					95% Adjusted-CLT UCL	0.015				97.5% Chebyshev (MVUE) UCL		0.0285
185					95% Modified-t UCL	0.016				99% Chebyshev (MVUE) UCL		0.0377
186												
187					Gamma Distribution Test					Data Distribution		
188					k star (bias corrected)	3.334				Data appear Normal at 5% Significance Level		
189					Theta Star	0.00383						
190					nu star	53.34						
191					Approximate Chi Square Value (.05)	37.56				Nonparametric Statistics		
192					Adjusted Level of Significance	0.0195				95% CLT UCL		0.0157
193					Adjusted Chi Square Value	34.24				95% Jackknife UCL		0.0161
194										95% Standard Bootstrap UCL		0.0155
195					Anderson-Darling Test Statistic	0.699				95% Bootstrap-t UCL		0.0154
196					Anderson-Darling 5% Critical Value	0.719				95% Hall's Bootstrap UCL		0.0149
197					Kolmogorov-Smirnov Test Statistic	0.303				95% Percentile Bootstrap UCL		0.0153
198					Kolmogorov-Smirnov 5% Critical Value	0.295				95% BCA Bootstrap UCL		0.015
199					Data follow Appr. Gamma Distribution at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL		0.0204
200										97.5% Chebyshev(Mean, Sd) UCL		0.0237
201					Assuming Gamma Distribution					99% Chebyshev(Mean, Sd) UCL		0.0302
202					95% Approximate Gamma UCL	0.0181						
203					95% Adjusted Gamma UCL	0.0199						
204												
205					Potential UCL to Use					Use 95% Student's-t UCL		0.0161
206												
207												
208	Hexavalent chromium (cw-2d)											
209												
210					General Statistics							
211					Number of Valid Data	8				Number of Detected Data		4
212					Number of Distinct Detected Data	4				Number of Non-Detect Data		4

	Percent Non-Detects	50.00%
Raw Statistics		**Log-transformed Statistics**
Minimum Detected	0.0018	Minimum Detected	-6.32
Maximum Detected	0.0033	Maximum Detected	-5.714
Mean of Detected	0.00253	Mean of Detected	-6.014
SD of Detected	0.0007366	SD of Detected	0.298
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.883	Shapiro Wilk Test Statistic	0.883
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00151	Mean	-6.808
SD	0.00118	SD	0.87
95% DL/2 (t) UCL	0.00231	95% H-Stat (DL/2) UCL	0.00214
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00254	Mean in Log Scale	-6.479
SD	0.0006379	SD in Log Scale	0.565
95% MLE (t) UCL	0.00296	Mean in Original Scale	0.00176
95% MLE (Tiku) UCL	0.00314	SD in Original Scale	0.0009665
		95% Percentile Bootstrap UCL	0.0023
		95% BCA Bootstrap UCL	0.00239
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	4.01	**Data appear Normal at 5% Significance Level**	
Theta Star	0.0006296		
nu star	32.08		
A-D Test Statistic	0.415	**Nonparametric Statistics**	
5% A-D Critical Value	0.657	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.657	Mean	0.00216
5% K-S Critical Value	0.395	SD	0.0005787
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0002362
		95% KM (t) UCL	0.00261
Assuming Gamma Distribution		95% KM (z) UCL	0.00255
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.00256
Minimum	0.00164	95% KM (bootstrap t) UCL	0.00373
Maximum	0.0033	95% KM (BCA) UCL	0.00308

266				Mean	0.00253				95% KM (Percentile Bootstrap) UCL			0.00304
267				Median	0.0026				95% KM (Chebyshev) UCL			0.00319
268				SD	0.0006643				97.5% KM (Chebyshev) UCL			0.00364
269				k star	9.874				99% KM (Chebyshev) UCL			0.00451
270				Theta star	0.0002557							
271				Nu star	158				**Potential UCLs to Use**			
272				AppChi2	129.9				95% KM (t) UCL			0.00261
273				95% Gamma Approximate UCL	0.00307				95% KM (Percentile Bootstrap) UCL			0.00304
274				95% Adjusted Gamma UCL	N/A							
275	**Note: DL/2 is not a recommended method.**											
276												
277												
278	**Hexavalent chromium (cw-2m)**											
279												
280	**General Statistics**											
281				Number of Valid Observations	8				Number of Distinct Observations			8
282												
283	**Raw Statistics**								**Log-transformed Statistics**			
284				Minimum	0.0131				Minimum of Log Data			-4.335
285				Maximum	0.0158				Maximum of Log Data			-4.148
286				Mean	0.0148				Mean of log Data			-4.212
287				Median	0.015				SD of log Data			0.0621
288				SD	0.0008975							
289				Coefficient of Variation	0.0605							
290				Skewness	-0.982							
291												
292												
293	**Warning: There are only 8 Values in this data**											
294	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
295	**the resulting calculations may not be reliable enough to draw conclusions**											
296												
297	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
298												
299	**Relevant UCL Statistics**											
300	**Normal Distribution Test**								**Lognormal Distribution Test**			
301				Shapiro Wilk Test Statistic	0.905				Shapiro Wilk Test Statistic			0.894
302				Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value			0.818
303	**Data appear Normal at 5% Significance Level**								**Data appear Lognormal at 5% Significance Level**			
304												
305	**Assuming Normal Distribution**								**Assuming Lognormal Distribution**			
306				95% Student's-t UCL	0.0154				95% H-UCL			N/A
307	**95% UCLs (Adjusted for Skewness)**								95% Chebyshev (MVUE) UCL			0.0163
308				95% Adjusted-CLT UCL	0.0152				97.5% Chebyshev (MVUE) UCL			0.0169
309				95% Modified-t UCL	0.0154				99% Chebyshev (MVUE) UCL			0.0181
310												
311	**Gamma Distribution Test**								**Data Distribution**			
312				k star (bias corrected)	188.9				**Data appear Normal at 5% Significance Level**			
313				Theta Star	7.854E-05							
314				nu star	3023							
315				Approximate Chi Square Value (.05)	2896				**Nonparametric Statistics**			
316				Adjusted Level of Significance	0.0195				95% CLT UCL			0.0154
317				Adjusted Chi Square Value	2864				95% Jackknife UCL			0.0154
318									95% Standard Bootstrap UCL			0.0153

319				Anderson-Darling Test Statistic	0.408					95% Bootstrap-t UCL	0.0153	
320				Anderson-Darling 5% Critical Value	0.715					95% Hall's Bootstrap UCL	0.0153	
321				Kolmogorov-Smirnov Test Statistic	0.211					95% Percentile Bootstrap UCL	0.0153	
322				Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	0.0153	
323				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0162	
324										97.5% Chebyshev(Mean, Sd) UCL	0.0168	
325				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.018	
326				95% Approximate Gamma UCL	0.0155							
327				95% Adjusted Gamma UCL	0.0157							
328												
329				**Potential UCL to Use**						Use 95% Student's-t UCL	0.0154	
330												
331												
332	**Hexavalent chromium (cw-3d)**											
333												
334				**General Statistics**								
335				Number of Valid Data	8					Number of Detected Data	5	
336				Number of Distinct Detected Data	4					Number of Non-Detect Data	3	
337										Percent Non-Detects	37.50%	
338												
339				**Raw Statistics**						**Log-transformed Statistics**		
340				Minimum Detected	0.002					Minimum Detected	-6.215	
341				Maximum Detected	0.0047					Maximum Detected	-5.36	
342				Mean of Detected	0.00296					Mean of Detected	-5.867	
343				SD of Detected	0.00105					SD of Detected	0.323	
344				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
345				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
346												
347												
348				**Warning: There are only 4 Distinct Detected Values in this data**								
349				**Note: It should be noted that even though bootstrap may be performed on this data set**								
350				**the resulting calculations may not be reliable enough tp draw conclusions**								
351												
352				**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**								
353												
354												
355				**UCL Statistics**								
356				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
357				Shapiro Wilk Test Statistic	0.856					Shapiro Wilk Test Statistic	0.921	
358				5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762	
359				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
360												
361				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
362				DL/2 Substitution Method						DL/2 Substitution Method		
363				Mean	0.00204					Mean	-6.517	
364				SD	0.0015					SD	0.93	
365				95% DL/2 (t) UCL	0.00304					95% H-Stat (DL/2) UCL	0.00435	
366												
367				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
368				Mean	0.00298					Mean in Log Scale	-6.204	
369				SD	0.0009372					SD in Log Scale	0.539	
370				95% MLE (t) UCL	0.00361					Mean in Original Scale	0.00229	
371				95% MLE (Tiku) UCL	0.00377					SD in Original Scale	0.00123	

372											95% Percentile Bootstrap UCL	0.00298
373											95% BCA Bootstrap UCL	0.00307
374												
375	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
376					k star (bias corrected)	4.719	**Data appear Normal at 5% Significance Level**					
377					Theta Star	0.0006273						
378					nu star	47.19						
379												
380					A-D Test Statistic	0.392	**Nonparametric Statistics**					
381					5% A-D Critical Value	0.679	Kaplan-Meier (KM) Method					
382					K-S Test Statistic	0.679					Mean	0.0026
383					5% K-S Critical Value	0.358					SD	0.0008746
384	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0003457
385											95% KM (t) UCL	0.00326
386	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00317
387					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00321
388					Minimum	0.00176					95% KM (bootstrap t) UCL	0.00409
389					Maximum	0.0047					95% KM (BCA) UCL	0.0034
390					Mean	0.00274					95% KM (Percentile Bootstrap) UCL	0.00333
391					Median	0.0025					95% KM (Chebyshev) UCL	0.00411
392					SD	0.0009042					97.5% KM (Chebyshev) UCL	0.00476
393					k star	7.748					99% KM (Chebyshev) UCL	0.00604
394					Theta star	0.0003535						
395					Nu star	124	**Potential UCLs to Use**					
396					AppChi2	99.25					95% KM (t) UCL	0.00326
397					95% Gamma Approximate UCL	0.00342					95% KM (Percentile Bootstrap) UCL	0.00333
398					95% Adjusted Gamma UCL	0.00362						
399	**Note: DL/2 is not a recommended method.**											
400												
401												
402	**Hexavalent chromium (cw-3m)**											
403												
404	**General Statistics**											
405					Number of Valid Observations	8					Number of Distinct Observations	7
406												
407	**Raw Statistics**						**Log-transformed Statistics**					
408					Minimum	0.0057					Minimum of Log Data	-5.167
409					Maximum	0.0118					Maximum of Log Data	-4.44
410					Mean	0.00965					Mean of log Data	-4.674
411					Median	0.011					SD of log Data	0.289
412					SD	0.00244						
413					Coefficient of Variation	0.253						
414					Skewness	-0.983						
415												
416												
417	**Warning: There are only 8 Values in this data**											
418	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
419	**the resulting calculations may not be reliable enough to draw conclusions**											
420												
421	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
422												
423	**Relevant UCL Statistics**											
424	**Normal Distribution Test**						**Lognormal Distribution Test**					

425				Shapiro Wilk Test Statistic	0.804					Shapiro Wilk Test Statistic	0.779	
426				Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818	
427				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
428												
429				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
430				95% Student's-t UCL	0.0113					95% H-UCL	0.0122	
431				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.014	
432				95% Adjusted-CLT UCL	0.0107					97.5% Chebyshev (MVUE) UCL	0.0159	
433				95% Modified-t UCL	0.0112					99% Chebyshev (MVUE) UCL	0.0196	
434												
435				**Gamma Distribution Test**						**Data Distribution**		
436				k star (bias corrected)	9.524					**Data do not follow a Discernable Distribution (0.05)**		
437				Theta Star	0.00101							
438				nu star	152.4							
439				Approximate Chi Square Value (.05)	124.9					**Nonparametric Statistics**		
440				Adjusted Level of Significance	0.0195					95% CLT UCL	0.0111	
441				Adjusted Chi Square Value	118.5					95% Jackknife UCL	0.0113	
442										95% Standard Bootstrap UCL	0.011	
443				Anderson-Darling Test Statistic	0.877					95% Bootstrap-t UCL	0.011	
444				Anderson-Darling 5% Critical Value	0.716					95% Hall's Bootstrap UCL	0.0107	
445				Kolmogorov-Smirnov Test Statistic	0.301					95% Percentile Bootstrap UCL	0.0109	
446				Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	0.0108	
447				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0134	
448										97.5% Chebyshev(Mean, Sd) UCL	0.015	
449				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0182	
450				95% Approximate Gamma UCL	0.0118							
451				95% Adjusted Gamma UCL	0.0124							
452												
453				**Potential UCL to Use**						Use 95% Student's-t UCL	0.0113	
454										or 95% Modified-t UCL	0.0112	
455												
456												
457	**Hexavalent chromium (cw-4d)**											
458												
459				**General Statistics**								
460				Number of Valid Data	8					Number of Detected Data	4	
461				Number of Distinct Detected Data	4					Number of Non-Detect Data	4	
462										Percent Non-Detects	50.00%	
463												
464				**Raw Statistics**						**Log-transformed Statistics**		
465				Minimum Detected	0.0023					Minimum Detected	-6.075	
466				Maximum Detected	0.0034					Maximum Detected	-5.684	
467				Mean of Detected	0.00278					Mean of Detected	-5.897	
468				SD of Detected	0.0004646					SD of Detected	0.164	
469				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
470				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
471												
472												
473				**Warning: There are only 4 Distinct Detected Values in this data**								
474				**Note: It should be noted that even though bootstrap may be performed on this data set**								
475				**the resulting calculations may not be reliable enough tp draw conclusions**								
476												
477				**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**								

478												
479												
480	**UCL Statistics**											
481	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
482	Shapiro Wilk Test Statistic				0.963		Shapiro Wilk Test Statistic					0.982
483	5% Shapiro Wilk Critical Value				0.748		5% Shapiro Wilk Critical Value					0.748
484	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
485												
486	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
487	DL/2 Substitution Method						DL/2 Substitution Method					
488	Mean				0.00164		Mean					-6.749
489	SD				0.00125		SD					0.917
490	95% DL/2 (t) UCL				0.00248		95% H-Stat (DL/2) UCL					0.00368
491												
492	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
493	Mean				0.00126		Mean in Log Scale					-6.164
494	SD				0.00169		SD in Log Scale					0.323
495	95% MLE (t) UCL				0.00239		Mean in Original Scale					0.0022
496	95% MLE (Tiku) UCL				0.00265		SD in Original Scale					0.0007058
497							95% Percentile Bootstrap UCL					0.00257
498							95% BCA Bootstrap UCL					0.00261
499												
500	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
501	k star (bias corrected)				12.47		**Data appear Normal at 5% Significance Level**					
502	Theta Star				0.0002226							
503	nu star				99.73							
504												
505	A-D Test Statistic				0.236		**Nonparametric Statistics**					
506	5% A-D Critical Value				0.656		Kaplan-Meier (KM) Method					
507	K-S Test Statistic				0.656		Mean					0.00254
508	5% K-S Critical Value				0.394		SD					0.0003706
509	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0001513
510							95% KM (t) UCL					0.00282
511	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00279
512	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00282
513	Minimum				0.00222		95% KM (bootstrap t) UCL					0.00284
514	Maximum				0.0034		95% KM (BCA) UCL					0.00303
515	Mean				0.00278		95% KM (Percentile Bootstrap) UCL					0.00295
516	Median				0.00274		95% KM (Chebyshev) UCL					0.0032
517	SD				0.0004172		97.5% KM (Chebyshev) UCL					0.00348
518	k star				31.56		99% KM (Chebyshev) UCL					0.00404
519	Theta star				8.793E-05							
520	Nu star				504.9		**Potential UCLs to Use**					
521	AppChi2				453.8		95% KM (t) UCL					0.00282
522	95% Gamma Approximate UCL				0.00309		95% KM (Percentile Bootstrap) UCL					0.00295
523	95% Adjusted Gamma UCL				N/A							
524	**Note: DL/2 is not a recommended method.**											
525												
526												
527	**Hexavalent chromium (cw-4m)**											
528												
529	**General Statistics**											
530	Number of Valid Data				8		Number of Detected Data					7

531	Number of Distinct Detected Data				7					Number of Non-Detect Data		1
532										Percent Non-Detects		12.50%
533												
534	**Raw Statistics**						**Log-transformed Statistics**					
535	Minimum Detected				0.0111		Minimum Detected					-4.501
536	Maximum Detected				0.0214		Maximum Detected					-3.844
537	Mean of Detected				0.0186		Mean of Detected					-4.007
538	SD of Detected				0.00389		SD of Detected					0.245
539	Minimum Non-Detect				0.0002		Minimum Non-Detect					-8.517
540	Maximum Non-Detect				0.0002		Maximum Non-Detect					-8.517
541												
542												
543	**Warning: There are only 7 Detected Values in this data**											
544	**Note: It should be noted that even though bootstrap may be performed on this data set**											
545	**the resulting calculations may not be reliable enough tp draw conclusions**											
546												
547	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
548												
549												
550	**UCL Statistics**											
551	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
552	Shapiro Wilk Test Statistic				0.771		Shapiro Wilk Test Statistic					0.738
553	5% Shapiro Wilk Critical Value				0.803		5% Shapiro Wilk Critical Value					0.803
554	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
555												
556	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
557	DL/2 Substitution Method						DL/2 Substitution Method					
558	Mean				0.0163		Mean					-4.657
559	SD				0.00747		SD					1.854
560	95% DL/2 (t) UCL				0.0213		95% H-Stat (DL/2) UCL					0.677
561												
562	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
563	Mean				0.0186		Mean in Log Scale					-4.071
564	SD				0.0036		SD in Log Scale					0.289
565	95% MLE (t) UCL				0.021		Mean in Original Scale					0.0177
566	95% MLE (Tiku) UCL				0.0212		SD in Original Scale					0.00451
567							95% Percentile Bootstrap UCL					0.0199
568							95% BCA Bootstrap UCL					0.0197
569												
570	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
571	k star (bias corrected)				12.57		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
572	Theta Star				0.00148							
573	nu star				176							
574												
575	A-D Test Statistic				0.883		**Nonparametric Statistics**					
576	5% A-D Critical Value				0.707		Kaplan-Meier (KM) Method					
577	K-S Test Statistic				0.707		Mean					0.0177
578	5% K-S Critical Value				0.311		SD					0.00419
579	**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean					0.0016
580							95% KM (t) UCL					0.0207
581	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0203
582	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0208
583	Minimum				0.0111		95% KM (bootstrap t) UCL					0.02

584				Maximum	0.0214					95% KM (BCA) UCL		0.0209
585				Mean	0.0177					95% KM (Percentile Bootstrap) UCL		0.0205
586				Median	0.02					95% KM (Chebyshev) UCL		0.0246
587				SD	0.00438					97.5% KM (Chebyshev) UCL		0.0277
588				k star	10.18					99% KM (Chebyshev) UCL		0.0336
589				Theta star	0.00174							
590				Nu star	162.8					**Potential UCLs to Use**		
591				AppChi2	134.3					95% KM (BCA) UCL		0.0209
592				95% Gamma Approximate UCL	0.0215							
593				95% Adjusted Gamma UCL	0.0226							
594	**Note: DL/2 is not a recommended method.**											
595												
596												
597	**Hexavalent chromium (mw-1)**											
598												
599					**General Statistics**							
600				Number of Valid Data	6					Number of Detected Data		3
601				Number of Distinct Detected Data	3					Number of Non-Detect Data		3
602										Percent Non-Detects		50.00%
603												
604				**Raw Statistics**						**Log-transformed Statistics**		
605				Minimum Detected	0.0046					Minimum Detected		-5.382
606				Maximum Detected	0.0048					Maximum Detected		-5.339
607				Mean of Detected	0.0047					Mean of Detected		-5.36
608				SD of Detected	0.0001					SD of Detected		0.0213
609				Minimum Non-Detect	0.01					Minimum Non-Detect		-4.605
610				Maximum Non-Detect	0.01					Maximum Non-Detect		-4.605
611												
612												
613	**Warning: There are only 3 Distinct Detected Values in this data set**											
614	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
615	**Those methods will return a 'N/A' value on your output display!**											
616												
617	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
618	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
619												
620												
621					**UCL Statistics**							
622				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
623				Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic		1
624				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value		0.767
625				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
626												
627				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
628				DL/2 Substitution Method						DL/2 Substitution Method		
629				Mean	0.00485					Mean		-5.329
630				SD	0.0001761					SD		0.0365
631				95% DL/2 (t) UCL	0.00499					95% H-Stat (DL/2) UCL		0.0226
632												
633				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
634				**MLE method failed to converge properly**						Mean in Log Scale		-5.36
635										SD in Log Scale		0.019
636										Mean in Original Scale		0.0047

637											SD in Original Scale	8.945E-05
638											95% Percentile Bootstrap UCL	0.00475
639											95% BCA Bootstrap UCL	0.00475
640												
641	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
642					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
643					Theta Star	N/A						
644					nu star	N/A						
645												
646					A-D Test Statistic	0.253	**Nonparametric Statistics**					
647					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
648					K-S Test Statistic	N/A					Mean	0.0047
649					5% K-S Critical Value	N/A					SD	8.165E-05
650	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	5.774E-05
651											95% KM (t) UCL	0.00482
652	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00479
653					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00483
654					Minimum	N/A					95% KM (bootstrap t) UCL	0.00487
655					Maximum	N/A					95% KM (BCA) UCL	0.00475
656					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0048
657					Median	N/A					95% KM (Chebyshev) UCL	0.00495
658					SD	N/A					97.5% KM (Chebyshev) UCL	0.00506
659					k star	N/A					99% KM (Chebyshev) UCL	0.00527
660					Theta star	N/A						
661					Nu star	N/A	**Potential UCLs to Use**					
662					AppChi2	N/A					95% KM (t) UCL	0.00482
663					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0048
664					95% Adjusted Gamma UCL	N/A						
665	**Warning: Recommended UCL exceeds the maximum observation**											
666	**Note: DL/2 is not a recommended method.**											
667												
668												
669	**Hexavalent chromium (mw-10)**											
670												
671	**General Statistics**											
672					Number of Valid Observations	37					Number of Distinct Observations	31
673												
674	**Raw Statistics**						**Log-transformed Statistics**					
675					Minimum	0.755					Minimum of Log Data	-0.281
676					Maximum	4.57					Maximum of Log Data	1.52
677					Mean	1.838					Mean of log Data	0.547
678					Median	1.87					SD of log Data	0.35
679					SD	0.699						
680					Coefficient of Variation	0.38						
681					Skewness	1.842						
682												
683	**Relevant UCL Statistics**											
684	**Normal Distribution Test**						**Lognormal Distribution Test**					
685					Shapiro Wilk Test Statistic	0.861					Shapiro Wilk Test Statistic	0.97
686					Shapiro Wilk Critical Value	0.936					Shapiro Wilk Critical Value	0.936
687	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
688												
689	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					

690				95% Student's-t UCL	2.032						95% H-UCL	2.043
691				**95% UCLs (Adjusted for Skewness)**							95% Chebyshev (MVUE) UCL	2.307
692				95% Adjusted-CLT UCL	2.064						97.5% Chebyshev (MVUE) UCL	2.511
693				95% Modified-t UCL	2.037						99% Chebyshev (MVUE) UCL	2.912
694												
695				**Gamma Distribution Test**							**Data Distribution**	
696				k star (bias corrected)	7.697						**Data appear Gamma Distributed at 5% Significance Level**	
697				Theta Star	0.239							
698				nu star	569.6							
699				Approximate Chi Square Value (.05)	515.2						**Nonparametric Statistics**	
700				Adjusted Level of Significance	0.0431						95% CLT UCL	2.027
701				Adjusted Chi Square Value	513						95% Jackknife UCL	2.032
702											95% Standard Bootstrap UCL	2.023
703				Anderson-Darling Test Statistic	0.565						95% Bootstrap-t UCL	2.099
704				Anderson-Darling 5% Critical Value	0.749						95% Hall's Bootstrap UCL	2.222
705				Kolmogorov-Smirnov Test Statistic	0.132						95% Percentile Bootstrap UCL	2.038
706				Kolmogorov-Smirnov 5% Critical Value	0.145						95% BCA Bootstrap UCL	2.057
707				**Data appear Gamma Distributed at 5% Significance Level**							95% Chebyshev(Mean, Sd) UCL	2.339
708											97.5% Chebyshev(Mean, Sd) UCL	2.555
709				**Assuming Gamma Distribution**							99% Chebyshev(Mean, Sd) UCL	2.981
710				95% Approximate Gamma UCL	2.031							
711				95% Adjusted Gamma UCL	2.04							
712												
713				**Potential UCL to Use**							Use 95% Approximate Gamma UCL	2.031
714												
715												
716	**Hexavalent chromium (mw-11)**											
717												
718				**General Statistics**								
719				Number of Valid Observations	34						Number of Distinct Observations	33
720												
721				**Raw Statistics**							**Log-transformed Statistics**	
722				Minimum	0.02						Minimum of Log Data	-3.912
723				Maximum	1.71						Maximum of Log Data	0.536
724				Mean	0.599						Mean of log Data	-0.694
725				Median	0.465						SD of log Data	0.725
726				SD	0.348							
727				Coefficient of Variation	0.581							
728				Skewness	1.531							
729												
730				**Relevant UCL Statistics**								
731				**Normal Distribution Test**							**Lognormal Distribution Test**	
732				Shapiro Wilk Test Statistic	0.849						Shapiro Wilk Test Statistic	0.77
733				Shapiro Wilk Critical Value	0.933						Shapiro Wilk Critical Value	0.933
734				**Data not Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**	
735												
736				**Assuming Normal Distribution**							**Assuming Lognormal Distribution**	
737				95% Student's-t UCL	0.7						95% H-UCL	0.849
738				**95% UCLs (Adjusted for Skewness)**							95% Chebyshev (MVUE) UCL	1.025
739				95% Adjusted-CLT UCL	0.714						97.5% Chebyshev (MVUE) UCL	1.19
740				95% Modified-t UCL	0.703						99% Chebyshev (MVUE) UCL	1.513
741												
742				**Gamma Distribution Test**							**Data Distribution**	

743				k star (bias corrected)	2.671		**Data do not follow a Discernable Distribution (0.05)**					
744				Theta Star	0.224							
745				nu star	181.6							
746				Approximate Chi Square Value (.05)	151.4		**Nonparametric Statistics**					
747				Adjusted Level of Significance	0.0422					95% CLT UCL	0.697	
748				Adjusted Chi Square Value	150.1					95% Jackknife UCL	0.7	
749										95% Standard Bootstrap UCL	0.692	
750				Anderson-Darling Test Statistic	1.176					95% Bootstrap-t UCL	0.731	
751				Anderson-Darling 5% Critical Value	0.754					95% Hall's Bootstrap UCL	0.734	
752				Kolmogorov-Smirnov Test Statistic	0.193					95% Percentile Bootstrap UCL	0.699	
753				Kolmogorov-Smirnov 5% Critical Value	0.152					95% BCA Bootstrap UCL	0.716	
754				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.86	
755										97.5% Chebyshev(Mean, Sd) UCL	0.972	
756				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	1.194	
757				95% Approximate Gamma UCL	0.719							
758				95% Adjusted Gamma UCL	0.725							
759												
760				**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	0.86	
761												
762												
763	**Hexavalent chromium (mw-12)**											
764												
765				**General Statistics**								
766				Number of Valid Observations	40					Number of Distinct Observations	36	
767												
768				**Raw Statistics**						**Log-transformed Statistics**		
769				Minimum	0.311					Minimum of Log Data	-1.168	
770				Maximum	2.97					Maximum of Log Data	1.089	
771				Mean	1.155					Mean of log Data	6.674E-05	
772				Median	1.005					SD of log Data	0.55	
773				SD	0.649							
774				Coefficient of Variation	0.562							
775				Skewness	1.271							
776												
777				**Relevant UCL Statistics**								
778				**Normal Distribution Test**						**Lognormal Distribution Test**		
779				Shapiro Wilk Test Statistic	0.872					Shapiro Wilk Test Statistic	0.966	
780				Shapiro Wilk Critical Value	0.94					Shapiro Wilk Critical Value	0.94	
781				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
782												
783				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
784				95% Student's-t UCL	1.328					95% H-UCL	1.38	
785				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	1.623	
786				95% Adjusted-CLT UCL	1.346					97.5% Chebyshev (MVUE) UCL	1.824	
787				95% Modified-t UCL	1.332					99% Chebyshev (MVUE) UCL	2.219	
788												
789				**Gamma Distribution Test**						**Data Distribution**		
790				k star (bias corrected)	3.366					**Data appear Gamma Distributed at 5% Significance Level**		
791				Theta Star	0.343							
792				nu star	269.3							
793				Approximate Chi Square Value (.05)	232.3					**Nonparametric Statistics**		
794				Adjusted Level of Significance	0.044					95% CLT UCL	1.324	
795				Adjusted Chi Square Value	231					95% Jackknife UCL	1.328	

796											95% Standard Bootstrap UCL	1.321
797				Anderson-Darling Test Statistic	0.505						95% Bootstrap-t UCL	1.356
798				Anderson-Darling 5% Critical Value	0.753						95% Hall's Bootstrap UCL	1.362
799				Kolmogorov-Smirnov Test Statistic	0.121						95% Percentile Bootstrap UCL	1.328
800				Kolmogorov-Smirnov 5% Critical Value	0.14						95% BCA Bootstrap UCL	1.336
801				**Data appear Gamma Distributed at 5% Significance Level**							95% Chebyshev(Mean, Sd) UCL	1.603
802											97.5% Chebyshev(Mean, Sd) UCL	1.796
803				**Assuming Gamma Distribution**							99% Chebyshev(Mean, Sd) UCL	2.177
804				95% Approximate Gamma UCL	1.339							
805				95% Adjusted Gamma UCL	1.347							
806												
807				**Potential UCL to Use**							Use 95% Approximate Gamma UCL	1.339
808												
809												
810	**Hexavalent chromium (mw-13)**											
811												
812					**General Statistics**							
813				Number of Valid Data	37						Number of Detected Data	35
814				Number of Distinct Detected Data	26						Number of Non-Detect Data	2
815											Percent Non-Detects	5.41%
816												
817				**Raw Statistics**							**Log-transformed Statistics**	
818				Minimum Detected	0.01						Minimum Detected	-4.605
819				Maximum Detected	0.028						Maximum Detected	-3.576
820				Mean of Detected	0.0196						Mean of Detected	-3.964
821				SD of Detected	0.0047						SD of Detected	0.279
822				Minimum Non-Detect	0.01						Minimum Non-Detect	-4.605
823				Maximum Non-Detect	0.01						Maximum Non-Detect	-4.605
824												
825												
826					**UCL Statistics**							
827				**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**	
828				Shapiro Wilk Test Statistic	0.926						Shapiro Wilk Test Statistic	0.845
829				5% Shapiro Wilk Critical Value	0.934						5% Shapiro Wilk Critical Value	0.934
830				**Data not Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**	
831												
832				**Assuming Normal Distribution**							**Assuming Lognormal Distribution**	
833				DL/2 Substitution Method							DL/2 Substitution Method	
834				Mean	0.0189						Mean	-4.036
835				SD	0.00567						SD	0.409
836				95% DL/2 (t) UCL	0.0204						95% H-Stat (DL/2) UCL	0.021
837												
838				Maximum Likelihood Estimate(MLE) Method							Log ROS Method	
839				Mean	0.019						Mean in Log Scale	-3.997
840				SD	0.00526						SD in Log Scale	0.306
841				95% MLE (t) UCL	0.0205						Mean in Original Scale	0.0191
842				95% MLE (Tiku) UCL	0.0205						SD in Original Scale	0.00505
843											95% Percentile Bootstrap UCL	0.0205
844											95% BCA Bootstrap UCL	0.0204
845												
846				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
847				k star (bias corrected)	13.65						**Data do not follow a Discernable Distribution (0.05)**	
848				Theta Star	0.00144							

849					nu star	955.5						
850												
851					A-D Test Statistic	1.502	**Nonparametric Statistics**					
852					5% A-D Critical Value	0.748					Kaplan-Meier (KM) Method	
853					K-S Test Statistic	0.748					Mean	0.0191
854					5% K-S Critical Value	0.149					SD	0.00501
855	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0008355
856											95% KM (t) UCL	0.0205
857	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0205
858					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0205
859					Minimum	0.00678					95% KM (bootstrap t) UCL	0.0205
860					Maximum	0.028					95% KM (BCA) UCL	0.0204
861					Mean	0.019					95% KM (Percentile Bootstrap) UCL	0.0205
862					Median	0.02					95% KM (Chebyshev) UCL	0.0228
863					SD	0.00531					97.5% KM (Chebyshev) UCL	0.0243
864					k star	9.57					99% KM (Chebyshev) UCL	0.0274
865					Theta star	0.00199						
866					Nu star	708.2	**Potential UCLs to Use**					
867					AppChi2	647.4					95% KM (Chebyshev) UCL	0.0228
868					95% Gamma Approximate UCL	0.0208						
869					95% Adjusted Gamma UCL	0.0209						
870	**Note: DL/2 is not a recommended method.**											
871												
872												
873	**Hexavalent chromium (mw-14)**											
874												
875	**General Statistics**											
876					Number of Valid Data	37					Number of Detected Data	36
877					Number of Distinct Detected Data	26					Number of Non-Detect Data	1
878											Percent Non-Detects	2.70%
879												
880	**Raw Statistics**						**Log-transformed Statistics**					
881					Minimum Detected	0.01					Minimum Detected	-4.605
882					Maximum Detected	0.099					Maximum Detected	-2.313
883					Mean of Detected	0.0334					Mean of Detected	-3.487
884					SD of Detected	0.015					SD of Detected	0.431
885					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
886					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
887												
888												
889	**UCL Statistics**											
890	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
891					Shapiro Wilk Test Statistic	0.787					Shapiro Wilk Test Statistic	0.886
892					5% Shapiro Wilk Critical Value	0.935					5% Shapiro Wilk Critical Value	0.935
893	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
894												
895	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
896					DL/2 Substitution Method						DL/2 Substitution Method	
897					Mean	0.0326					Mean	-3.536
898					SD	0.0155					SD	0.519
899					95% DL/2 (t) UCL	0.0369					95% H-Stat (DL/2) UCL	0.0385
900												
901					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	

902					Mean	0.0325					Mean in Log Scale	-3.514
903					SD	0.0154					SD in Log Scale	0.457
904					95% MLE (t) UCL	0.0368					Mean in Original Scale	0.0328
905					95% MLE (Tiku) UCL	0.0367					SD in Original Scale	0.0152
906											95% Percentile Bootstrap UCL	0.037
907											95% BCA Bootstrap UCL	0.0378
908												
909	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
910					k star (bias corrected)	5.474					**Data do not follow a Discernable Distribution (0.05)**	
911					Theta Star	0.00609						
912					nu star	394.1						
913												
914					A-D Test Statistic	1.654					**Nonparametric Statistics**	
915					5% A-D Critical Value	0.75					Kaplan-Meier (KM) Method	
916					K-S Test Statistic	0.75					Mean	0.0327
917					5% K-S Critical Value	0.147					SD	0.0151
918	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00251
919											95% KM (t) UCL	0.037
920	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0369
921	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.037
922					Minimum	0.0009556					95% KM (bootstrap t) UCL	0.0385
923					Maximum	0.099					95% KM (BCA) UCL	0.0373
924					Mean	0.0325					95% KM (Percentile Bootstrap) UCL	0.0369
925					Median	0.032					95% KM (Chebyshev) UCL	0.0437
926					SD	0.0157					97.5% KM (Chebyshev) UCL	0.0484
927					k star	3.157					99% KM (Chebyshev) UCL	0.0577
928					Theta star	0.0103						
929					Nu star	233.6					**Potential UCLs to Use**	
930					AppChi2	199.3					95% KM (Chebyshev) UCL	0.0437
931					95% Gamma Approximate UCL	0.0381						
932					95% Adjusted Gamma UCL	0.0384						
933	**Note: DL/2 is not a recommended method.**											
934												
935												
936	**Hexavalent chromium (mw-15)**											
937												
938	**General Statistics**											
939					Number of Valid Data	32					Number of Detected Data	23
940					Number of Distinct Detected Data	19					Number of Non-Detect Data	9
941											Percent Non-Detects	28.13%
942												
943	**Raw Statistics**										**Log-transformed Statistics**	
944					Minimum Detected	0.0076					Minimum Detected	-4.88
945					Maximum Detected	0.05					Maximum Detected	-2.996
946					Mean of Detected	0.0156					Mean of Detected	-4.301
947					SD of Detected	0.00993					SD of Detected	0.517
948					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
949					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
950												
951												
952	**UCL Statistics**											
953	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
954					Shapiro Wilk Test Statistic	0.766					Shapiro Wilk Test Statistic	0.908

955				5% Shapiro Wilk Critical Value	0.914					5% Shapiro Wilk Critical Value	0.914
956	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
957												
958	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
959				DL/2 Substitution Method						DL/2 Substitution Method	
960				Mean	0.0126					Mean	-4.582
961				SD	0.00967					SD	0.63
962				95% DL/2 (t) UCL	0.0155					95% H-Stat (DL/2) UCL	0.0159
963											
964				Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
965				Mean	0.00942					Mean in Log Scale	-4.481
966				SD	0.0132					SD in Log Scale	0.542
967				95% MLE (t) UCL	0.0134					Mean in Original Scale	0.0133
968				95% MLE (Tiku) UCL	0.0141					SD in Original Scale	0.00922
969										95% Percentile Bootstrap UCL	0.0162
970										95% BCA Bootstrap UCL	0.0167
971											
972	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
973				k star (bias corrected)	3.204		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
974				Theta Star	0.00488							
975				nu star	147.4							
976												
977				A-D Test Statistic	0.937		**Nonparametric Statistics**					
978				5% A-D Critical Value	0.75					Kaplan-Meier (KM) Method	
979				K-S Test Statistic	0.75					Mean	0.0135
980				5% K-S Critical Value	0.183					SD	0.00894
981	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean	0.00162
982										95% KM (t) UCL	0.0162
983	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0161
984				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0162
985				Minimum	0.00123					95% KM (bootstrap t) UCL	0.0175
986				Maximum	0.05					95% KM (BCA) UCL	0.0165
987				Mean	0.0145					95% KM (Percentile Bootstrap) UCL	0.0163
988				Median	0.0122					95% KM (Chebyshev) UCL	0.0205
989				SD	0.00906					97.5% KM (Chebyshev) UCL	0.0235
990				k star	2.783					99% KM (Chebyshev) UCL	0.0295
991				Theta star	0.00521						
992				Nu star	178.1		**Potential UCLs to Use**					
993				AppChi2	148.3					95% KM (Percentile Bootstrap) UCL	0.0163
994				95% Gamma Approximate UCL	0.0174						
995				95% Adjusted Gamma UCL	0.0176						
996	**Note: DL/2 is not a recommended method.**											
997												
998												
999	**Hexavalent chromium (mw-19)**											
1000												
1001	**General Statistics**											
1002				Number of Valid Observations	34					Number of Distinct Observations	32	
1003												
1004	**Raw Statistics**						**Log-transformed Statistics**					
1005				Minimum	0.557					Minimum of Log Data	-0.585	
1006				Maximum	1.39					Maximum of Log Data	0.329	
1007				Mean	0.839					Mean of log Data	-0.203	

1008					Median	0.756					SD of log Data	0.236
1009					SD	0.21						
1010					Coefficient of Variation	0.25						
1011					Skewness	0.881						
1012												
1013					**Relevant UCL Statistics**							
1014					**Normal Distribution Test**						**Lognormal Distribution Test**	
1015					Shapiro Wilk Test Statistic	0.9					Shapiro Wilk Test Statistic	0.935
1016					Shapiro Wilk Critical Value	0.933					Shapiro Wilk Critical Value	0.933
1017					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
1018												
1019					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1020					95% Student's-t UCL	0.9					95% H-UCL	0.902
1021					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.988
1022					95% Adjusted-CLT UCL	0.904					97.5% Chebyshev (MVUE) UCL	1.053
1023					95% Modified-t UCL	0.901					99% Chebyshev (MVUE) UCL	1.18
1024												
1025					**Gamma Distribution Test**						**Data Distribution**	
1026					k star (bias corrected)	16.44					**Data appear Lognormal at 5% Significance Level**	
1027					Theta Star	0.0511						
1028					nu star	1118						
1029					Approximate Chi Square Value (.05)	1041					**Nonparametric Statistics**	
1030					Adjusted Level of Significance	0.0422					95% CLT UCL	0.898
1031					Adjusted Chi Square Value	1038					95% Jackknife UCL	0.9
1032											95% Standard Bootstrap UCL	0.897
1033					Anderson-Darling Test Statistic	1.072					95% Bootstrap-t UCL	0.909
1034					Anderson-Darling 5% Critical Value	0.747					95% Hall's Bootstrap UCL	0.902
1035					Kolmogorov-Smirnov Test Statistic	0.159					95% Percentile Bootstrap UCL	0.901
1036					Kolmogorov-Smirnov 5% Critical Value	0.151					95% BCA Bootstrap UCL	0.91
1037					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.996
1038											97.5% Chebyshev(Mean, Sd) UCL	1.064
1039					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	1.197
1040					95% Approximate Gamma UCL	0.901						
1041					95% Adjusted Gamma UCL	0.904						
1042												
1043					**Potential UCL to Use**						Use 95% Student's-t UCL	0.9
1044											or 95% Modified-t UCL	0.901
1045											or 95% H-UCL	0.902
1046												
1047												
1048	**Hexavalent chromium (mw-20-100)**											
1049												
1050					**General Statistics**							
1051					Number of Valid Observations	37					Number of Distinct Observations	36
1052												
1053					**Raw Statistics**						**Log-transformed Statistics**	
1054					Minimum	1.35					Minimum of Log Data	0.3
1055					Maximum	10.4					Maximum of Log Data	2.342
1056					Mean	5.12					Mean of log Data	1.449
1057					Median	3.09					SD of log Data	0.611
1058					SD	3.186						
1059					Coefficient of Variation	0.622						
1060					Skewness	0.677						

1061												
1062	**Relevant UCL Statistics**											
1063	**Normal Distribution Test**						**Lognormal Distribution Test**					
1064				Shapiro Wilk Test Statistic	0.768					Shapiro Wilk Test Statistic	0.847	
1065				Shapiro Wilk Critical Value	0.936					Shapiro Wilk Critical Value	0.936	
1066	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1067												
1068	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1069				95% Student's-t UCL	6.004					95% H-UCL	6.289	
1070	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	7.491	
1071				95% Adjusted-CLT UCL	6.044					97.5% Chebyshev (MVUE) UCL	8.525	
1072				95% Modified-t UCL	6.014					99% Chebyshev (MVUE) UCL	10.55	
1073												
1074	**Gamma Distribution Test**						**Data Distribution**					
1075				k star (bias corrected)	2.651		**Data do not follow a Discernable Distribution (0.05)**					
1076				Theta Star	1.931							
1077				nu star	196.2							
1078				Approximate Chi Square Value (.05)	164.8		**Nonparametric Statistics**					
1079				Adjusted Level of Significance	0.0431					95% CLT UCL	5.982	
1080				Adjusted Chi Square Value	163.5					95% Jackknife UCL	6.004	
1081										95% Standard Bootstrap UCL	5.95	
1082				Anderson-Darling Test Statistic	3.014					95% Bootstrap-t UCL	6.031	
1083				Anderson-Darling 5% Critical Value	0.755					95% Hall's Bootstrap UCL	6.027	
1084				Kolmogorov-Smirnov Test Statistic	0.252					95% Percentile Bootstrap UCL	5.962	
1085				Kolmogorov-Smirnov 5% Critical Value	0.146					95% BCA Bootstrap UCL	6.002	
1086	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	7.403	
1087										97.5% Chebyshev(Mean, Sd) UCL	8.391	
1088	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	10.33	
1089				95% Approximate Gamma UCL	6.096							
1090				95% Adjusted Gamma UCL	6.143							
1091												
1092	**Potential UCL to Use**									Use 95% Chebyshev (Mean, Sd) UCL	7.403	
1093												
1094												
1095	**Hexavalent chromium (mw-20-130)**											
1096												
1097	**General Statistics**											
1098				Number of Valid Observations	38					Number of Distinct Observations	36	
1099												
1100	**Raw Statistics**						**Log-transformed Statistics**					
1101				Minimum	3.66					Minimum of Log Data	1.297	
1102				Maximum	14.4					Maximum of Log Data	2.667	
1103				Mean	7.772					Mean of log Data	1.993	
1104				Median	6.595					SD of log Data	0.34	
1105				SD	2.743							
1106				Coefficient of Variation	0.353							
1107				Skewness	0.809							
1108												
1109	**Relevant UCL Statistics**											
1110	**Normal Distribution Test**						**Lognormal Distribution Test**					
1111				Shapiro Wilk Test Statistic	0.906					Shapiro Wilk Test Statistic	0.954	
1112				Shapiro Wilk Critical Value	0.938					Shapiro Wilk Critical Value	0.938	
1113	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					

1114												
1115	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1116					95% Student's-t UCL	8.522					95% H-UCL	8.599
1117	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	9.671
1118					95% Adjusted-CLT UCL	8.566					97.5% Chebyshev (MVUE) UCL	10.5
1119					95% Modified-t UCL	8.532					99% Chebyshev (MVUE) UCL	12.12
1120												
1121	**Gamma Distribution Test**						**Data Distribution**					
1122					k star (bias corrected)	8.212	**Data appear Lognormal at 5% Significance Level**					
1123					Theta Star	0.946						
1124					nu star	624.1						
1125					Approximate Chi Square Value (.05)	567.1	**Nonparametric Statistics**					
1126					Adjusted Level of Significance	0.0434					95% CLT UCL	8.503
1127					Adjusted Chi Square Value	564.9					95% Jackknife UCL	8.522
1128											95% Standard Bootstrap UCL	8.504
1129					Anderson-Darling Test Statistic	0.927					95% Bootstrap-t UCL	8.578
1130					Anderson-Darling 5% Critical Value	0.749					95% Hall's Bootstrap UCL	8.572
1131					Kolmogorov-Smirnov Test Statistic	0.166					95% Percentile Bootstrap UCL	8.512
1132					Kolmogorov-Smirnov 5% Critical Value	0.143					95% BCA Bootstrap UCL	8.514
1133	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	9.711
1134											97.5% Chebyshev(Mean, Sd) UCL	10.55
1135	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	12.2
1136					95% Approximate Gamma UCL	8.552						
1137					95% Adjusted Gamma UCL	8.586						
1138												
1139	**Potential UCL to Use**										Use 95% Student's-t UCL	8.522
1140											or 95% Modified-t UCL	8.532
1141											or 95% H-UCL	8.599
1142												
1143												
1144	**Hexavalent chromium (mw-20-70)**											
1145												
1146	**General Statistics**											
1147					Number of Valid Observations	39					Number of Distinct Observations	38
1148												
1149	**Raw Statistics**						**Log-transformed Statistics**					
1150					Minimum	2.4					Minimum of Log Data	0.875
1151					Maximum	13.2					Maximum of Log Data	2.58
1152					Mean	8.776					Mean of log Data	2.078
1153					Median	9					SD of log Data	0.481
1154					SD	3.252						
1155					Coefficient of Variation	0.37						
1156					Skewness	-0.557						
1157												
1158	**Relevant UCL Statistics**											
1159	**Normal Distribution Test**						**Lognormal Distribution Test**					
1160					Shapiro Wilk Test Statistic	0.916					Shapiro Wilk Test Statistic	0.839
1161					Shapiro Wilk Critical Value	0.939					Shapiro Wilk Critical Value	0.939
1162	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1163												
1164	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1165					95% Student's-t UCL	9.654					95% H-UCL	10.4
1166	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	12.08

1167				95% Adjusted-CLT UCL	9.583					97.5% Chebyshev (MVUE) UCL	13.44	
1168				95% Modified-t UCL	9.647					99% Chebyshev (MVUE) UCL	16.1	
1169												
1170				**Gamma Distribution Test**						**Data Distribution**		
1171				k star (bias corrected)	5.098					**Data do not follow a Discernable Distribution (0.05)**		
1172				Theta Star	1.722							
1173				nu star	397.6							
1174				Approximate Chi Square Value (.05)	352.4					**Nonparametric Statistics**		
1175				Adjusted Level of Significance	0.0437					95% CLT UCL	9.633	
1176				Adjusted Chi Square Value	350.8					95% Jackknife UCL	9.654	
1177										95% Standard Bootstrap UCL	9.605	
1178				Anderson-Darling Test Statistic	1.682					95% Bootstrap-t UCL	9.63	
1179				Anderson-Darling 5% Critical Value	0.751					95% Hall's Bootstrap UCL	9.586	
1180				Kolmogorov-Smirnov Test Statistic	0.154					95% Percentile Bootstrap UCL	9.632	
1181				Kolmogorov-Smirnov 5% Critical Value	0.142					95% BCA Bootstrap UCL	9.529	
1182				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	11.05	
1183										97.5% Chebyshev(Mean, Sd) UCL	12.03	
1184				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	13.96	
1185				95% Approximate Gamma UCL	9.903							
1186				95% Adjusted Gamma UCL	9.95							
1187												
1188				**Potential UCL to Use**						Use 95% Student's-t UCL	9.654	
1189										or 95% Modified-t UCL	9.647	
1190												
1191												
1192	**Hexavalent chromium (mw-21)**											
1193												
1194					**General Statistics**							
1195				Number of Valid Data	36					Number of Detected Data	1	
1196				Number of Distinct Detected Data	1					Number of Non-Detect Data	35	
1197										Percent Non-Detects	97.22%	
1198												
1199	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
1200	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
1201												
1202	**The data set for variable Hexavalent chromium (mw-21) was not processed!**											
1203												
1204												
1205												
1206	**Hexavalent chromium (mw-22)**											
1207												
1208					**General Statistics**							
1209				Number of Valid Data	34					Number of Detected Data	0	
1210				Number of Distinct Detected Data	0					Number of Non-Detect Data	34	
1211										Percent Non-Detects	100.00%	
1212												
1213	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
1214	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
1215	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1216												
1217	**The data set for variable Hexavalent chromium (mw-22) was not processed!**											
1218												
1219												

1220												
1221	**Hexavalent chromium (mw-23)**											
1222												
1223						**General Statistics**						
1224					Number of Valid Data	36			Number of Detected Data		14	
1225					Number of Distinct Detected Data	14			Number of Non-Detect Data		22	
1226									Percent Non-Detects		61.11%	
1227												
1228				**Raw Statistics**				**Log-transformed Statistics**				
1229				Minimum Detected	0.0011			Minimum Detected	-6.812			
1230				Maximum Detected	1.02			Maximum Detected	0.0198			
1231				Mean of Detected	0.0838			Mean of Detected	-4.325			
1232				SD of Detected	0.27			SD of Detected	1.478			
1233				Minimum Non-Detect	0.0002			Minimum Non-Detect	-8.517			
1234				Maximum Non-Detect	0.01			Maximum Non-Detect	-4.605			
1235												
1236	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect	27			
1237	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected	9			
1238	Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	75.00%			
1239												
1240						**UCL Statistics**						
1241				**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**				
1242				Shapiro Wilk Test Statistic	0.317			Shapiro Wilk Test Statistic	0.779			
1243				5% Shapiro Wilk Critical Value	0.874			5% Shapiro Wilk Critical Value	0.874			
1244				**Data not Normal at 5% Significance Level**				**Data not Lognormal at 5% Significance Level**				
1245												
1246				**Assuming Normal Distribution**				**Assuming Lognormal Distribution**				
1247				DL/2 Substitution Method				DL/2 Substitution Method				
1248				Mean	0.0351			Mean	-5.265			
1249				SD	0.169			SD	1.538			
1250				95% DL/2 (t) UCL	0.0827			95% H-Stat (DL/2) UCL	0.0423			
1251												
1252				Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method				
1253				**MLE yields a negative mean**				Mean in Log Scale	-5.859			
1254								SD in Log Scale	1.801			
1255								Mean in Original Scale	0.0338			
1256								SD in Original Scale	0.169			
1257								95% Percentile Bootstrap UCL	0.09			
1258								95% BCA Bootstrap UCL	0.119			
1259												
1260				**Gamma Distribution Test with Detected Values Only**				**Data Distribution Test with Detected Values Only**				
1261				k star (bias corrected)	0.332			**Data do not follow a Discernable Distribution (0.05)**				
1262				Theta Star	0.252							
1263				nu star	9.305							
1264												
1265				A-D Test Statistic	3.009			**Nonparametric Statistics**				
1266				5% A-D Critical Value	0.82			Kaplan-Meier (KM) Method				
1267				K-S Test Statistic	0.82			Mean	0.0345			
1268				5% K-S Critical Value	0.246			SD	0.167			
1269				**Data not Gamma Distributed at 5% Significance Level**				SE of Mean	0.0288			
1270								95% KM (t) UCL	0.0833			
1271				**Assuming Gamma Distribution**				95% KM (z) UCL	0.082			
1272				Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL	0.0814			

1273					Minimum	1E-09				95% KM (bootstrap t) UCL		0.948
1274					Maximum	1.02				95% KM (BCA) UCL		0.0943
1275					Mean	0.0808				95% KM (Percentile Bootstrap) UCL		0.0912
1276					Median	0.0465				95% KM (Chebyshev) UCL		0.16
1277					SD	0.167				97.5% KM (Chebyshev) UCL		0.215
1278					k star	0.362				99% KM (Chebyshev) UCL		0.321
1279					Theta star	0.223						
1280					Nu star	26.07				**Potential UCLs to Use**		
1281					AppChi2	15.43				95% KM (BCA) UCL		0.0943
1282					95% Gamma Approximate UCL	0.136						
1283					95% Adjusted Gamma UCL	0.14						
1284	**Note: DL/2 is not a recommended method.**											
1285												
1286												
1287	**Hexavalent chromium (mw-24a)**											
1288												
1289	**General Statistics**											
1290	Number of Valid Observations					32				Number of Distinct Observations		29
1291												
1292	**Raw Statistics**									**Log-transformed Statistics**		
1293	Minimum					2.48				Minimum of Log Data		0.908
1294	Maximum					4.3				Maximum of Log Data		1.459
1295	Mean					3.236				Mean of log Data		1.166
1296	Median					3.26				SD of log Data		0.128
1297	SD					0.415						
1298	Coefficient of Variation					0.128						
1299	Skewness					0.285						
1300												
1301	**Relevant UCL Statistics**											
1302	**Normal Distribution Test**									**Lognormal Distribution Test**		
1303	Shapiro Wilk Test Statistic					0.983				Shapiro Wilk Test Statistic		0.986
1304	Shapiro Wilk Critical Value					0.93				Shapiro Wilk Critical Value		0.93
1305	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
1306												
1307	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
1308	95% Student's-t UCL					3.361				95% H-UCL		3.367
1309	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL		3.557
1310	95% Adjusted-CLT UCL					3.361				97.5% Chebyshev (MVUE) UCL		3.696
1311	95% Modified-t UCL					3.361				99% Chebyshev (MVUE) UCL		3.969
1312												
1313	**Gamma Distribution Test**									**Data Distribution**		
1314	k star (bias corrected)					57.1				**Data appear Normal at 5% Significance Level**		
1315	Theta Star					0.0567						
1316	nu star					3654						
1317	Approximate Chi Square Value (.05)					3515				**Nonparametric Statistics**		
1318	Adjusted Level of Significance					0.0416				95% CLT UCL		3.357
1319	Adjusted Chi Square Value					3508				95% Jackknife UCL		3.361
1320										95% Standard Bootstrap UCL		3.353
1321	Anderson-Darling Test Statistic					0.157				95% Bootstrap-t UCL		3.363
1322	Anderson-Darling 5% Critical Value					0.745				95% Hall's Bootstrap UCL		3.37
1323	Kolmogorov-Smirnov Test Statistic					0.0665				95% Percentile Bootstrap UCL		3.352
1324	Kolmogorov-Smirnov 5% Critical Value					0.155				95% BCA Bootstrap UCL		3.356
1325	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL		3.556

1326											97.5% Chebyshev(Mean, Sd) UCL	3.695
1327			**Assuming Gamma Distribution**								99% Chebyshev(Mean, Sd) UCL	3.967
1328					95% Approximate Gamma UCL	3.365						
1329					95% Adjusted Gamma UCL	3.372						
1330												
1331			**Potential UCL to Use**								Use 95% Student's-t UCL	3.361
1332												
1333												
1334	**Hexavalent chromium (mw-24b)**											
1335												
1336						**General Statistics**							
1337					Number of Valid Observations	34					Number of Distinct Observations	33
1338												
1339			**Raw Statistics**						**Log-transformed Statistics**			
1340					Minimum	0.741					Minimum of Log Data	-0.3
1341					Maximum	6.12					Maximum of Log Data	1.812
1342					Mean	4.617					Mean of log Data	1.486
1343					Median	4.81					SD of log Data	0.362
1344					SD	1.044						
1345					Coefficient of Variation	0.226						
1346					Skewness	-1.623						
1347												
1348						**Relevant UCL Statistics**						
1349			**Normal Distribution Test**						**Lognormal Distribution Test**			
1350					Shapiro Wilk Test Statistic	0.89					Shapiro Wilk Test Statistic	0.623
1351					Shapiro Wilk Critical Value	0.933					Shapiro Wilk Critical Value	0.933
1352			**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**			
1353												
1354			**Assuming Normal Distribution**						**Assuming Lognormal Distribution**			
1355					95% Student's-t UCL	4.92					95% H-UCL	5.291
1356			**95% UCLs (Adjusted for Skewness)**								95% Chebyshev (MVUE) UCL	6.012
1357					95% Adjusted-CLT UCL	4.858					97.5% Chebyshev (MVUE) UCL	6.577
1358					95% Modified-t UCL	4.912					99% Chebyshev (MVUE) UCL	7.686
1359												
1360			**Gamma Distribution Test**						**Data Distribution**			
1361					k star (bias corrected)	10.53			**Data do not follow a Discernable Distribution (0.05)**			
1362					Theta Star	0.439						
1363					nu star	715.9						
1364					Approximate Chi Square Value (.05)	654.8			**Nonparametric Statistics**			
1365					Adjusted Level of Significance	0.0422					95% CLT UCL	4.911
1366					Adjusted Chi Square Value	651.9					95% Jackknife UCL	4.92
1367											95% Standard Bootstrap UCL	4.904
1368					Anderson-Darling Test Statistic	2.194					95% Bootstrap-t UCL	4.878
1369					Anderson-Darling 5% Critical Value	0.747					95% Hall's Bootstrap UCL	4.861
1370					Kolmogorov-Smirnov Test Statistic	0.193					95% Percentile Bootstrap UCL	4.886
1371					Kolmogorov-Smirnov 5% Critical Value	0.151					95% BCA Bootstrap UCL	4.871
1372			**Data not Gamma Distributed at 5% Significance Level**								95% Chebyshev(Mean, Sd) UCL	5.397
1373											97.5% Chebyshev(Mean, Sd) UCL	5.735
1374			**Assuming Gamma Distribution**								99% Chebyshev(Mean, Sd) UCL	6.398
1375					95% Approximate Gamma UCL	5.047						
1376					95% Adjusted Gamma UCL	5.07						
1377												
1378			**Potential UCL to Use**								Use 95% Student's-t UCL	4.92

	or 95% Modified-t UCL	4.912

Hexavalent chromium (mw-24br)

General Statistics

Number of Valid Data	34	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	33
		Percent Non-Detects	97.06%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Hexavalent chromium (mw-24br) was not processed!

Hexavalent chromium (mw-25)

General Statistics

Number of Valid Observations	33	Number of Distinct Observations	32

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.933	Minimum of Log Data	-0.0694
Maximum	2.98	Maximum of Log Data	1.092
Mean	2.186	Mean of log Data	0.737
Median	2.35	SD of log Data	0.326
SD	0.598		
Coefficient of Variation	0.274		
Skewness	-0.706		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Test Statistic	0.851
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.363	95% H-UCL	2.444
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.754
95% Adjusted-CLT UCL	2.344	97.5% Chebyshev (MVUE) UCL	2.993
95% Modified-t UCL	2.361	99% Chebyshev (MVUE) UCL	3.465
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	10.15	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.215		
nu star	669.9		
Approximate Chi Square Value (.05)	610.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0419	95% CLT UCL	2.358
Adjusted Chi Square Value	607.9	95% Jackknife UCL	2.363
		95% Standard Bootstrap UCL	2.351
Anderson-Darling Test Statistic	1.527	95% Bootstrap-t UCL	2.344
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	2.347

1432				Kolmogorov-Smirnov Test Statistic	0.221					95% Percentile Bootstrap UCL	2.349	
1433				Kolmogorov-Smirnov 5% Critical Value	0.153					95% BCA Bootstrap UCL	2.338	
1434				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	2.64	
1435										97.5% Chebyshev(Mean, Sd) UCL	2.837	
1436				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	3.223	
1437				95% Approximate Gamma UCL	2.398							
1438				95% Adjusted Gamma UCL	2.409							
1439												
1440				**Potential UCL to Use**						Use 95% Student's-t UCL	2.363	
1441										or 95% Modified-t UCL	2.361	
1442												
1443												
1444	**Hexavalent chromium (mw-26)**											
1445												
1446				**General Statistics**								
1447				Number of Valid Data	35					Number of Detected Data	34	
1448				Number of Distinct Detected Data	30					Number of Non-Detect Data	1	
1449										Percent Non-Detects	2.86%	
1450												
1451				**Raw Statistics**						**Log-transformed Statistics**		
1452				Minimum Detected	0.759					Minimum Detected	-0.276	
1453				Maximum Detected	4.06					Maximum Detected	1.401	
1454				Mean of Detected	3.027					Mean of Detected	1.025	
1455				SD of Detected	0.981					SD of Detected	0.468	
1456				Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605	
1457				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
1458												
1459												
1460				**UCL Statistics**								
1461				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
1462				Shapiro Wilk Test Statistic	0.803					Shapiro Wilk Test Statistic	0.709	
1463				5% Shapiro Wilk Critical Value	0.933					5% Shapiro Wilk Critical Value	0.933	
1464				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
1465												
1466				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
1467				DL/2 Substitution Method						DL/2 Substitution Method		
1468				Mean	2.941					Mean	0.844	
1469				SD	1.093					SD	1.164	
1470				95% DL/2 (t) UCL	3.253					95% H-Stat (DL/2) UCL	7.674	
1471												
1472				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
1473				Mean	2.931					Mean in Log Scale	0.997	
1474				SD	1.106					SD in Log Scale	0.49	
1475				95% MLE (t) UCL	3.247					Mean in Original Scale	2.97	
1476				95% MLE (Tiku) UCL	3.251					SD in Original Scale	1.023	
1477										95% Percentile Bootstrap UCL	3.242	
1478										95% BCA Bootstrap UCL	3.225	
1479												
1480				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1481				k star (bias corrected)	5.696					**Data do not follow a Discernable Distribution (0.05)**		
1482				Theta Star	0.531							
1483				nu star	387.4							
1484												

1485				A-D Test Statistic	3.696	**Nonparametric Statistics**						
1486				5% A-D Critical Value	0.749					Kaplan-Meier (KM) Method		
1487				K-S Test Statistic	0.749					Mean	2.962	
1488				5% K-S Critical Value	0.151					SD	1.025	
1489	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.176	
1490										95% KM (t) UCL	3.26	
1491	**Assuming Gamma Distribution**									95% KM (z) UCL	3.251	
1492	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL	3.259	
1493				Minimum	0.343					95% KM (bootstrap t) UCL	3.229	
1494				Maximum	4.06					95% KM (BCA) UCL	3.229	
1495				Mean	2.95					95% KM (Percentile Bootstrap) UCL	3.245	
1496				Median	3.37					95% KM (Chebyshev) UCL	3.729	
1497				SD	1.068					97.5% KM (Chebyshev) UCL	4.06	
1498				k star	4.084					99% KM (Chebyshev) UCL	4.712	
1499				Theta star	0.722							
1500				Nu star	285.9	**Potential UCLs to Use**						
1501				AppChi2	247.7					95% KM (Chebyshev) UCL	3.729	
1502				95% Gamma Approximate UCL	3.405							
1503				95% Adjusted Gamma UCL	3.428							
1504	**Note: DL/2 is not a recommended method.**											
1505												
1506												
1507	**Hexavalent chromium (mw-27-20)**											
1508												
1509	**General Statistics**											
1510				Number of Valid Data	68	Number of Detected Data	0					
1511				Number of Distinct Detected Data	0	Number of Non-Detect Data	68					
1512						Percent Non-Detects	100.00%					
1513												
1514	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
1515	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
1516	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1517												
1518	**The data set for variable Hexavalent chromium (mw-27-20) was not processed!**											
1519												
1520												
1521												
1522	**Hexavalent chromium (mw-27-60)**											
1523												
1524	**General Statistics**											
1525				Number of Valid Data	18	Number of Detected Data	0					
1526				Number of Distinct Detected Data	0	Number of Non-Detect Data	18					
1527						Percent Non-Detects	100.00%					
1528												
1529	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
1530	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
1531	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1532												
1533	**The data set for variable Hexavalent chromium (mw-27-60) was not processed!**											
1534												
1535												
1536												
1537	**Hexavalent chromium (mw-27-85)**											

1538												
1539	**General Statistics**											
1540					Number of Valid Data	42			Number of Detected Data			1
1541					Number of Distinct Detected Data	1			Number of Non-Detect Data			41
1542									Percent Non-Detects			97.62%
1543												
1544	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
1545	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
1546												
1547	**The data set for variable Hexavalent chromium (mw-27-85) was not processed!**											
1548												
1549												
1550												
1551	**Hexavalent chromium (mw-28-25)**											
1552												
1553	**General Statistics**											
1554					Number of Valid Data	67			Number of Detected Data			0
1555					Number of Distinct Detected Data	0			Number of Non-Detect Data			67
1556									Percent Non-Detects			100.00%
1557												
1558	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
1559	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
1560	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1561												
1562	**The data set for variable Hexavalent chromium (mw-28-25) was not processed!**											
1563												
1564												
1565												
1566	**Hexavalent chromium (mw-28-90)**											
1567												
1568	**General Statistics**											
1569					Number of Valid Data	45			Number of Detected Data			0
1570					Number of Distinct Detected Data	0			Number of Non-Detect Data			45
1571									Percent Non-Detects			100.00%
1572												
1573	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
1574	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
1575	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1576												
1577	**The data set for variable Hexavalent chromium (mw-28-90) was not processed!**											
1578												
1579												
1580												
1581	**Hexavalent chromium (mw-29)**											
1582												
1583	**General Statistics**											
1584					Number of Valid Data	42			Number of Detected Data			0
1585					Number of Distinct Detected Data	0			Number of Non-Detect Data			42
1586									Percent Non-Detects			100.00%
1587												
1588	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
1589	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
1590	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											

	A	B	C	D	E	F	G	H	I	J	K	L
1591												
1592	**The data set for variable Hexavalent chromium (mw-29) was not processed!**											
1593												
1594												
1595												
1596	**Hexavalent chromium (mw-3)**											
1597												
1598	**General Statistics**											
1599	Number of Valid Observations	6					Number of Distinct Observations	4				
1600												
1601	**Raw Statistics**						**Log-transformed Statistics**					
1602	Minimum	0.0099					Minimum of Log Data	-4.615				
1603	Maximum	0.0117					Maximum of Log Data	-4.448				
1604	Mean	0.0103					Mean of log Data	-4.577				
1605	Median	0.01					SD of log Data	0.064				
1606	SD	0.0006928										
1607	Coefficient of Variation	0.0673										
1608	Skewness	2.344										
1609												
1610												
1611	**Warning: There are only 4 Distinct Values in this data**											
1612	**There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.**											
1613	**Those methods will return a 'N/A' value on your output display!**											
1614												
1615	**It is necessary to have 4 or more Distinct Values to compute bootstrap methods.**											
1616	**It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.**											
1617												
1618												
1619	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
1620												
1621	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
1622	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1623												
1624	**Relevant UCL Statistics**											
1625	**Normal Distribution Test**						**Lognormal Distribution Test**					
1626	Shapiro Wilk Test Statistic	0.614					Shapiro Wilk Test Statistic	0.622				
1627	Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788				
1628	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1629												
1630	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1631	95% Student's-t UCL	0.0109					95% H-UCL	N/A				
1632	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0115				
1633	95% Adjusted-CLT UCL	0.0111					97.5% Chebyshev (MVUE) UCL	0.012				
1634	95% Modified-t UCL	0.0109					99% Chebyshev (MVUE) UCL	0.013				
1635												
1636	**Gamma Distribution Test**						**Data Distribution**					
1637	k star (bias corrected)	141.7					**Data do not follow a Discernable Distribution (0.05)**					
1638	Theta Star	7.267E-05										
1639	nu star	1701										
1640	Approximate Chi Square Value (.05)	1606					**Nonparametric Statistics**					
1641	Adjusted Level of Significance	0.0122					95% CLT UCL	0.0108				
1642	Adjusted Chi Square Value	1572					95% Jackknife UCL	0.0109				
1643							95% Standard Bootstrap UCL	0.0107				

1644					Anderson-Darling Test Statistic	1.24				95% Bootstrap-t UCL		0.0148
1645					Anderson-Darling 5% Critical Value	0.696				95% Hall's Bootstrap UCL		0.0148
1646					Kolmogorov-Smirnov Test Statistic	0.391				95% Percentile Bootstrap UCL		0.0108
1647					Kolmogorov-Smirnov 5% Critical Value	0.332				95% BCA Bootstrap UCL		0.0109
1648					**Data not Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL		0.0115
1649										97.5% Chebyshev(Mean, Sd) UCL		0.0121
1650					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL		0.0131
1651					95% Approximate Gamma UCL	0.0109						
1652					95% Adjusted Gamma UCL	0.0111						
1653												
1654					**Potential UCL to Use**					Use 95% Student's-t UCL		0.0109
1655										or 95% Modified-t UCL		0.0109
1656												
1657												
1658	**Hexavalent chromium (mw-30-30)**											
1659												
1660					**General Statistics**							
1661					Number of Valid Data	58				Number of Detected Data		0
1662					Number of Distinct Detected Data	0				Number of Non-Detect Data		58
1663										Percent Non-Detects		100.00%
1664												
1665					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
1666					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
1667					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
1668												
1669					**The data set for variable Hexavalent chromium (mw-30-30) was not processed!**							
1670												
1671												
1672												
1673	**Hexavalent chromium (mw-30-50)**											
1674												
1675					**General Statistics**							
1676					Number of Valid Data	45				Number of Detected Data		34
1677					Number of Distinct Detected Data	33				Number of Non-Detect Data		11
1678										Percent Non-Detects		24.44%
1679												
1680					**Raw Statistics**					**Log-transformed Statistics**		
1681					Minimum Detected	0.0185				Minimum Detected		-3.99
1682					Maximum Detected	3.76				Maximum Detected		1.324
1683					Mean of Detected	1.419				Mean of Detected		-0.0758
1684					SD of Detected	0.907				SD of Detected		1.267
1685					Minimum Non-Detect	0.0002				Minimum Non-Detect		-8.517
1686					Maximum Non-Detect	0.001				Maximum Non-Detect		-6.908
1687												
1688	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		11
1689	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		34
1690	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		24.44%
1691												
1692					**UCL Statistics**							
1693					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
1694					Shapiro Wilk Test Statistic	0.949				Shapiro Wilk Test Statistic		0.774
1695					5% Shapiro Wilk Critical Value	0.933				5% Shapiro Wilk Critical Value		0.933
1696					**Data appear Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**		

1697												
1698	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1699				DL/2 Substitution Method						DL/2 Substitution Method		
1700				Mean		1.072				Mean		-1.987
1701				SD		0.999				SD		3.584
1702				95% DL/2 (t) UCL		1.322				95% H-Stat (DL/2) UCL		1239
1703												
1704				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
1705				Mean		0.894				Mean in Log Scale		-0.653
1706				SD		1.242				SD in Log Scale		1.524
1707				95% MLE (t) UCL		1.205				Mean in Original Scale		1.096
1708				95% MLE (Tiku) UCL		1.22				SD in Original Scale		0.973
1709										95% Percentile Bootstrap UCL		1.33
1710										95% BCA Bootstrap UCL		1.341
1711												
1712	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1713				k star (bias corrected)		1.22	**Data appear Normal at 5% Significance Level**					
1714				Theta Star		1.163						
1715				nu star		82.95						
1716												
1717				A-D Test Statistic		1.657	**Nonparametric Statistics**					
1718				5% A-D Critical Value		0.769				Kaplan-Meier (KM) Method		
1719				K-S Test Statistic		0.769				Mean		1.077
1720				5% K-S Critical Value		0.154				SD		0.983
1721	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.149
1722										95% KM (t) UCL		1.326
1723	**Assuming Gamma Distribution**									95% KM (z) UCL		1.321
1724				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1.324
1725				Minimum		1E-09				95% KM (bootstrap t) UCL		1.342
1726				Maximum		3.76				95% KM (BCA) UCL		1.332
1727				Mean		1.169				95% KM (Percentile Bootstrap) UCL		1.316
1728				Median		0.984				95% KM (Chebyshev) UCL		1.725
1729				SD		0.912				97.5% KM (Chebyshev) UCL		2.005
1730				k star		0.634				99% KM (Chebyshev) UCL		2.556
1731				Theta star		1.844						
1732				Nu star		57.05	**Potential UCLs to Use**					
1733				AppChi2		40.69				95% KM (t) UCL		1.326
1734				95% Gamma Approximate UCL		1.639				95% KM (Percentile Bootstrap) UCL		1.316
1735				95% Adjusted Gamma UCL		1.658						
1736	**Note: DL/2 is not a recommended method.**											
1737												
1738												
1739	**Hexavalent chromium (mw-31-135)**											
1740												
1741	**General Statistics**											
1742				Number of Valid Observations	14					Number of Distinct Observations	14	
1743												
1744	**Raw Statistics**						**Log-transformed Statistics**					
1745				Minimum	0.0332					Minimum of Log Data	-3.405	
1746				Maximum	0.422					Maximum of Log Data	-0.863	
1747				Mean	0.221					Mean of log Data	-1.776	
1748				Median	0.244					SD of log Data	0.856	
1749				SD	0.133							

1750					Coefficient of Variation	0.604						
1751					Skewness	-0.0307						
1752												
1753	**Relevant UCL Statistics**											
1754	**Normal Distribution Test**						**Lognormal Distribution Test**					
1755					Shapiro Wilk Test Statistic	0.937					Shapiro Wilk Test Statistic	0.871
1756					Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value	0.874
1757	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1758												
1759	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1760					95% Student's-t UCL	0.284					95% H-UCL	0.449
1761	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.488
1762					95% Adjusted-CLT UCL	0.279					97.5% Chebyshev (MVUE) UCL	0.597
1763					95% Modified-t UCL	0.284					99% Chebyshev (MVUE) UCL	0.811
1764												
1765	**Gamma Distribution Test**						**Data Distribution**					
1766					k star (bias corrected)	1.651	**Data appear Normal at 5% Significance Level**					
1767					Theta Star	0.134						
1768					nu star	46.24						
1769					Approximate Chi Square Value (.05)	31.64	**Nonparametric Statistics**					
1770					Adjusted Level of Significance	0.0312					95% CLT UCL	0.279
1771					Adjusted Chi Square Value	30.04					95% Jackknife UCL	0.284
1772											95% Standard Bootstrap UCL	0.278
1773					Anderson-Darling Test Statistic	0.573					95% Bootstrap-t UCL	0.281
1774					Anderson-Darling 5% Critical Value	0.746					95% Hall's Bootstrap UCL	0.278
1775					Kolmogorov-Smirnov Test Statistic	0.194					95% Percentile Bootstrap UCL	0.277
1776					Kolmogorov-Smirnov 5% Critical Value	0.232					95% BCA Bootstrap UCL	0.276
1777	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.376
1778											97.5% Chebyshev(Mean, Sd) UCL	0.443
1779	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.575
1780					95% Approximate Gamma UCL	0.322						
1781					95% Adjusted Gamma UCL	0.34						
1782												
1783	**Potential UCL to Use**										Use 95% Student's-t UCL	0.284
1784												
1785												
1786	**Hexavalent chromium (mw-31-60)**											
1787												
1788	**General Statistics**											
1789					Number of Valid Observations	36					Number of Distinct Observations	35
1790												
1791	**Raw Statistics**						**Log-transformed Statistics**					
1792					Minimum	0.626					Minimum of Log Data	-0.468
1793					Maximum	4.52					Maximum of Log Data	1.509
1794					Mean	3.028					Mean of log Data	0.987
1795					Median	3.59					SD of log Data	0.571
1796					SD	1.172						
1797					Coefficient of Variation	0.387						
1798					Skewness	-0.983						
1799												
1800	**Relevant UCL Statistics**											
1801	**Normal Distribution Test**						**Lognormal Distribution Test**					
1802					Shapiro Wilk Test Statistic	0.823					Shapiro Wilk Test Statistic	0.738

1803					Shapiro Wilk Critical Value	0.935					Shapiro Wilk Critical Value	0.935
1804	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1805												
1806	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1807					95% Student's-t UCL	3.358					95% H-UCL	3.816
1808	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	4.521
1809					95% Adjusted-CLT UCL	3.315					97.5% Chebyshev (MVUE) UCL	5.118
1810					95% Modified-t UCL	3.352					99% Chebyshev (MVUE) UCL	6.291
1811												
1812	**Gamma Distribution Test**						**Data Distribution**					
1813					k star (bias corrected)	3.946	**Data do not follow a Discernable Distribution (0.05)**					
1814					Theta Star	0.767						
1815					nu star	284.1						
1816					Approximate Chi Square Value (.05)	246.1	**Nonparametric Statistics**					
1817					Adjusted Level of Significance	0.0428					95% CLT UCL	3.349
1818					Adjusted Chi Square Value	244.5					95% Jackknife UCL	3.358
1819											95% Standard Bootstrap UCL	3.336
1820					Anderson-Darling Test Statistic	3.648					95% Bootstrap-t UCL	3.315
1821					Anderson-Darling 5% Critical Value	0.752					95% Hall's Bootstrap UCL	3.311
1822					Kolmogorov-Smirnov Test Statistic	0.265					95% Percentile Bootstrap UCL	3.323
1823					Kolmogorov-Smirnov 5% Critical Value	0.147					95% BCA Bootstrap UCL	3.328
1824	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	3.879
1825											97.5% Chebyshev(Mean, Sd) UCL	4.247
1826	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	4.971
1827					95% Approximate Gamma UCL	3.496						
1828					95% Adjusted Gamma UCL	3.519						
1829												
1830	**Potential UCL to Use**										Use 95% Chebyshev (Mean, Sd) UCL	3.879
1831												
1832												
1833	**Hexavalent chromium (mw-32-20)**											
1834												
1835	**General Statistics**											
1836					Number of Valid Data	30					Number of Detected Data	0
1837					Number of Distinct Detected Data	0					Number of Non-Detect Data	30
1838											Percent Non-Detects	100.00%
1839												
1840	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
1841	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
1842	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1843												
1844	**The data set for variable Hexavalent chromium (mw-32-20) was not processed!**											
1845												
1846												
1847												
1848	**Hexavalent chromium (mw-32-35)**											
1849												
1850	**General Statistics**											
1851					Number of Valid Data	29					Number of Detected Data	0
1852					Number of Distinct Detected Data	0					Number of Non-Detect Data	29
1853											Percent Non-Detects	100.00%
1854												
1855	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											

1856	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1857	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1858												
1859	The data set for variable Hexavalent chromium (mw-32-35) was not processed!											
1860												
1861												
1862												
1863	Hexavalent chromium (mw-33-150)											
1864												
1865	General Statistics											
1866						Number of Valid Data	24			Number of Detected Data	22	
1867						Number of Distinct Detected Data	19			Number of Non-Detect Data	2	
1868										Percent Non-Detects	8.33%	
1869												
1870	Raw Statistics							Log-transformed Statistics				
1871						Minimum Detected	0.0031			Minimum Detected	-5.776	
1872						Maximum Detected	0.0108			Maximum Detected	-4.528	
1873						Mean of Detected	0.00635			Mean of Detected	-5.11	
1874						SD of Detected	0.00203			SD of Detected	0.328	
1875						Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908	
1876						Maximum Non-Detect	0.001			Maximum Non-Detect	-6.908	
1877												
1878												
1879	UCL Statistics											
1880	Normal Distribution Test with Detected Values Only							Lognormal Distribution Test with Detected Values Only				
1881						Shapiro Wilk Test Statistic	0.965			Shapiro Wilk Test Statistic	0.978	
1882						5% Shapiro Wilk Critical Value	0.911			5% Shapiro Wilk Critical Value	0.911	
1883	Data appear Normal at 5% Significance Level							Data appear Lognormal at 5% Significance Level				
1884												
1885	Assuming Normal Distribution							Assuming Lognormal Distribution				
1886						DL/2 Substitution Method				DL/2 Substitution Method		
1887						Mean	0.00586			Mean	-5.317	
1888						SD	0.00255			SD	0.77	
1889						95% DL/2 (t) UCL	0.00675			95% H-Stat (DL/2) UCL	0.00944	
1890												
1891						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		
1892						Mean	0.00582			Mean in Log Scale	-5.174	
1893						SD	0.0026			SD in Log Scale	0.382	
1894						95% MLE (t) UCL	0.00673			Mean in Original Scale	0.00605	
1895						95% MLE (Tiku) UCL	0.00675			SD in Original Scale	0.00219	
1896										95% Percentile Bootstrap UCL	0.00678	
1897										95% BCA Bootstrap UCL	0.00681	
1898												
1899	Gamma Distribution Test with Detected Values Only							Data Distribution Test with Detected Values Only				
1900						k star (bias corrected)	8.799	Data appear Normal at 5% Significance Level				
1901						Theta Star	0.0007213					
1902						nu star	387.2					
1903												
1904						A-D Test Statistic	0.225	Nonparametric Statistics				
1905						5% A-D Critical Value	0.744			Kaplan-Meier (KM) Method		
1906						K-S Test Statistic	0.744			Mean	0.00608	
1907						5% K-S Critical Value	0.185			SD	0.0021	
1908	Data appear Gamma Distributed at 5% Significance Level									SE of Mean	0.0004394	

1909											95% KM (t) UCL	0.00683
1910	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0068
1911				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.0068
1912					Minimum	0.00177					95% KM (bootstrap t) UCL	0.00685
1913					Maximum	0.0108					95% KM (BCA) UCL	0.00687
1914					Mean	0.00601					95% KM (Percentile Bootstrap) UCL	0.00684
1915					Median	0.00595					95% KM (Chebyshev) UCL	0.00799
1916					SD	0.00227					97.5% KM (Chebyshev) UCL	0.00882
1917					k star	5.708					99% KM (Chebyshev) UCL	0.0104
1918					Theta star	0.00105						
1919					Nu star	274					**Potential UCLs to Use**	
1920					AppChi2	236.6					95% KM (t) UCL	0.00683
1921				95% Gamma Approximate UCL		0.00695					95% KM (Percentile Bootstrap) UCL	0.00684
1922				95% Adjusted Gamma UCL		0.00703						
1923	**Note: DL/2 is not a recommended method.**											
1924												
1925												
1926	**Hexavalent chromium (mw-33-210)**											
1927												
1928						**General Statistics**						
1929					Number of Valid Data	24					Number of Detected Data	23
1930					Number of Distinct Detected Data	20					Number of Non-Detect Data	1
1931											Percent Non-Detects	4.17%
1932												
1933	**Raw Statistics**						**Log-transformed Statistics**					
1934					Minimum Detected	0.0014					Minimum Detected	-6.571
1935					Maximum Detected	0.0119					Maximum Detected	-4.431
1936					Mean of Detected	0.0078					Mean of Detected	-4.968
1937					SD of Detected	0.0031					SD of Detected	0.553
1938					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
1939					Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908
1940												
1941												
1942						**UCL Statistics**						
1943	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1944					Shapiro Wilk Test Statistic	0.913					Shapiro Wilk Test Statistic	0.827
1945					5% Shapiro Wilk Critical Value	0.914					5% Shapiro Wilk Critical Value	0.914
1946	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1947												
1948	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1949					DL/2 Substitution Method						DL/2 Substitution Method	
1950					Mean	0.0075					Mean	-5.078
1951					SD	0.00338					SD	0.762
1952					95% DL/2 (t) UCL	0.00868					95% H-Stat (DL/2) UCL	0.0119
1953												
1954					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
1955					Mean	0.00746					Mean in Log Scale	-5.02
1956					SD	0.00339					SD in Log Scale	0.597
1957					95% MLE (t) UCL	0.00865					Mean in Original Scale	0.00756
1958					95% MLE (Tiku) UCL	0.00866					SD in Original Scale	0.00326
1959											95% Percentile Bootstrap UCL	0.00866
1960											95% BCA Bootstrap UCL	0.00854
1961												

1962	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1963					k star (bias corrected)	3.957	**Data do not follow a Discernable Distribution (0.05)**					
1964					Theta Star	0.00197						
1965					nu star	182						
1966												
1967					A-D Test Statistic	1.207	**Nonparametric Statistics**					
1968					5% A-D Critical Value	0.748				Kaplan-Meier (KM) Method		
1969					K-S Test Statistic	0.748				Mean		0.00753
1970					5% K-S Critical Value	0.182				SD		0.00323
1971	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.0006751
1972										95% KM (t) UCL		0.00869
1973	**Assuming Gamma Distribution**									95% KM (z) UCL		0.00864
1974					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.00868
1975					Minimum	7.948E-05				95% KM (bootstrap t) UCL		0.00861
1976					Maximum	0.0119				95% KM (BCA) UCL		0.00867
1977					Mean	0.00748				95% KM (Percentile Bootstrap) UCL		0.00862
1978					Median	0.0091				95% KM (Chebyshev) UCL		0.0105
1979					SD	0.00342				97.5% KM (Chebyshev) UCL		0.0117
1980					k star	1.85				99% KM (Chebyshev) UCL		0.0143
1981					Theta star	0.00404						
1982					Nu star	88.78	**Potential UCLs to Use**					
1983					AppChi2	68.06				95% KM (Chebyshev) UCL		0.0105
1984					95% Gamma Approximate UCL	0.00976						
1985					95% Adjusted Gamma UCL	0.00994						
1986	**Note: DL/2 is not a recommended method.**											
1987												
1988												
1989	**Hexavalent chromium (mw-33-40)**											
1990												
1991						**General Statistics**						
1992					Number of Valid Data	29				Number of Detected Data		1
1993					Number of Distinct Detected Data	1				Number of Non-Detect Data		28
1994										Percent Non-Detects		96.55%
1995												
1996	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
1997	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
1998												
1999	**The data set for variable Hexavalent chromium (mw-33-40) was not processed!**											
2000												
2001												
2002												
2003	**Hexavalent chromium (mw-33-90)**											
2004												
2005						**General Statistics**						
2006					Number of Valid Data	56				Number of Detected Data		52
2007					Number of Distinct Detected Data	38				Number of Non-Detect Data		4
2008										Percent Non-Detects		7.14%
2009												
2010					**Raw Statistics**					**Log-transformed Statistics**		
2011					Minimum Detected	0.012				Minimum Detected		-4.423
2012					Maximum Detected	0.0213				Maximum Detected		-3.849
2013					Mean of Detected	0.0161				Mean of Detected		-4.135
2014					SD of Detected	0.00223				SD of Detected		0.137

2015					Minimum Non-Detect	0.0002					Minimum Non-Detect	-8.517
2016					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
2017												
2018	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	4
2019	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	52
2020	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	7.14%
2021												
2022	**UCL Statistics**											
2023	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2024					Lilliefors Test Statistic	0.1					Lilliefors Test Statistic	0.0831
2025					5% Lilliefors Critical Value	0.123					5% Lilliefors Critical Value	0.123
2026	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2027												
2028	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2029					DL/2 Substitution Method						DL/2 Substitution Method	
2030					Mean	0.0153					Mean	-4.288
2031					SD	0.00391					SD	0.732
2032					95% DL/2 (t) UCL	0.0161					95% H-Stat (DL/2) UCL	0.0198
2033												
2034					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2035					Mean	0.0156					Mean in Log Scale	-4.158
2036					SD	0.00284					SD in Log Scale	0.156
2037					95% MLE (t) UCL	0.0163					Mean in Original Scale	0.0158
2038					95% MLE (Tiku) UCL	0.0163					SD in Original Scale	0.00245
2039											95% Percentile Bootstrap UCL	0.0164
2040											95% BCA Bootstrap UCL	0.0164
2041												
2042	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2043					k star (bias corrected)	51.25	**Data appear Normal at 5% Significance Level**					
2044					Theta Star	0.000315						
2045					nu star	5330						
2046												
2047					A-D Test Statistic	0.442	**Nonparametric Statistics**					
2048					5% A-D Critical Value	0.748					Kaplan-Meier (KM) Method	
2049					K-S Test Statistic	0.748					Mean	0.0159
2050					5% K-S Critical Value	0.123					SD	0.00238
2051	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0003218
2052											95% KM (t) UCL	0.0164
2053	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0164
2054					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0164
2055					Minimum	0.0103					95% KM (bootstrap t) UCL	0.0164
2056					Maximum	0.0213					95% KM (BCA) UCL	0.0164
2057					Mean	0.0158					95% KM (Percentile Bootstrap) UCL	0.0164
2058					Median	0.0156					95% KM (Chebyshev) UCL	0.0173
2059					SD	0.0025					97.5% KM (Chebyshev) UCL	0.0179
2060					k star	38.09					99% KM (Chebyshev) UCL	0.0191
2061					Theta star	0.0004148						
2062					Nu star	4266	**Potential UCLs to Use**					
2063					AppChi2	4115					95% KM (t) UCL	0.0164
2064					95% Gamma Approximate UCL	0.0164					95% KM (Percentile Bootstrap) UCL	0.0164
2065					95% Adjusted Gamma UCL	0.0164						
2066	**Note: DL/2 is not a recommended method.**											
2067												

2068												
2069	**Hexavalent chromium (mw-34-100)**											
2070												
2071	**General Statistics**											
2072					Number of Valid Observations	79				Number of Distinct Observations	72	
2073												
2074	**Raw Statistics**						**Log-transformed Statistics**					
2075					Minimum	0.0739				Minimum of Log Data	-2.605	
2076					Maximum	0.976				Maximum of Log Data	-0.0243	
2077					Mean	0.679				Mean of log Data	-0.435	
2078					Median	0.723				SD of log Data	0.361	
2079					SD	0.177						
2080					Coefficient of Variation	0.261						
2081					Skewness	-0.636						
2082												
2083	**Relevant UCL Statistics**											
2084	**Normal Distribution Test**						**Lognormal Distribution Test**					
2085					Lilliefors Test Statistic	0.115				Lilliefors Test Statistic	0.129	
2086					Lilliefors Critical Value	0.0997				Lilliefors Critical Value	0.0997	
2087	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2088												
2089	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2090					95% Student's-t UCL	0.712				95% H-UCL	0.742	
2091	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.816	
2092					95% Adjusted-CLT UCL	0.71				97.5% Chebyshev (MVUE) UCL	0.87	
2093					95% Modified-t UCL	0.712				99% Chebyshev (MVUE) UCL	0.977	
2094												
2095	**Gamma Distribution Test**						**Data Distribution**					
2096					k star (bias corrected)	10.1	**Data do not follow a Discernable Distribution (0.05)**					
2097					Theta Star	0.0672						
2098					nu star	1596						
2099					Approximate Chi Square Value (.05)	1505	**Nonparametric Statistics**					
2100					Adjusted Level of Significance	0.047				95% CLT UCL	0.712	
2101					Adjusted Chi Square Value	1503				95% Jackknife UCL	0.712	
2102										95% Standard Bootstrap UCL	0.712	
2103					Anderson-Darling Test Statistic	1.94				95% Bootstrap-t UCL	0.713	
2104					Anderson-Darling 5% Critical Value	0.751				95% Hall's Bootstrap UCL	0.711	
2105					Kolmogorov-Smirnov Test Statistic	0.127				95% Percentile Bootstrap UCL	0.711	
2106					Kolmogorov-Smirnov 5% Critical Value	0.1				95% BCA Bootstrap UCL	0.709	
2107	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.766	
2108										97.5% Chebyshev(Mean, Sd) UCL	0.803	
2109	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.877	
2110					95% Approximate Gamma UCL	0.721						
2111					95% Adjusted Gamma UCL	0.721						
2112												
2113	**Potential UCL to Use**									Use 95% Student's-t UCL	0.712	
2114										or 95% Modified-t UCL	0.712	
2115												
2116												
2117	**Hexavalent chromium (mw-34-55)**											
2118												
2119	**General Statistics**											
2120					Number of Valid Data	44				Number of Detected Data	0	

2121					Number of Distinct Detected Data	0					Number of Non-Detect Data	44
2122											Percent Non-Detects	100.00%
2123												
2124	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2125	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
2126	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2127												
2128	**The data set for variable Hexavalent chromium (mw-34-55) was not processed!**											
2129												
2130												
2131												
2132	**Hexavalent chromium (mw-34-80)**											
2133												
2134	**General Statistics**											
2135					Number of Valid Data	88					Number of Detected Data	13
2136					Number of Distinct Detected Data	13					Number of Non-Detect Data	75
2137											Percent Non-Detects	85.23%
2138												
2139	**Raw Statistics**						**Log-transformed Statistics**					
2140					Minimum Detected	0.00086					Minimum Detected	-7.059
2141					Maximum Detected	0.111					Maximum Detected	-2.198
2142					Mean of Detected	0.0248					Mean of Detected	-4.761
2143					SD of Detected	0.036					SD of Detected	1.63
2144					Minimum Non-Detect	0.0002					Minimum Non-Detect	-8.517
2145					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
2146												
2147	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	82
2148	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	6
2149	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	93.18%
2150												
2151	**UCL Statistics**											
2152	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2153					Lilliefors Test Statistic	0.697					Lilliefors Test Statistic	0.953
2154					5% Lilliefors Critical Value	0.866					5% Lilliefors Critical Value	0.866
2155	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2156												
2157	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2158					DL/2 Substitution Method						DL/2 Substitution Method	
2159					Mean	0.00419					Mean	-7.168
2160					SD	0.0159					SD	1.267
2161					95% DL/2 (t) UCL	0.00701					95% H-Stat (DL/2) UCL	0.00185
2162												
2163					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2164	**MLE yields a negative mean**										Mean in Log Scale	-8.99
2165											SD in Log Scale	2.795
2166											Mean in Original Scale	0.00395
2167											SD in Original Scale	0.016
2168											95% Percentile Bootstrap UCL	0.00697
2169											95% BCA Bootstrap UCL	0.00831
2170												
2171	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2172					k star (bias corrected)	0.5	**Data appear Gamma Distributed at 5% Significance Level**					
2173					Theta Star	0.0496						

2174					nu star	13						
2175												
2176					A-D Test Statistic	0.425	**Nonparametric Statistics**					
2177					5% A-D Critical Value	0.783					Kaplan-Meier (KM) Method	
2178					K-S Test Statistic	0.783					Mean	0.0044
2179					5% K-S Critical Value	0.248					SD	0.0158
2180	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00175
2181											95% KM (t) UCL	0.00731
2182	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00728
2183					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00721
2184					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0126
2185					Maximum	0.111					95% KM (BCA) UCL	0.00892
2186					Mean	0.0181					95% KM (Percentile Bootstrap) UCL	0.00766
2187					Median	0.0189					95% KM (Chebyshev) UCL	0.012
2188					SD	0.0173					97.5% KM (Chebyshev) UCL	0.0153
2189					k star	0.265					99% KM (Chebyshev) UCL	0.0218
2190					Theta star	0.0681						
2191					Nu star	46.64	**Potential UCLs to Use**					
2192					AppChi2	31.97					95% KM (t) UCL	0.00731
2193					95% Gamma Approximate UCL	0.0263						
2194					95% Adjusted Gamma UCL	0.0265						
2195	**Note: DL/2 is not a recommended method.**											
2196												
2197												
2198	**Hexavalent chromium (mw-35-135)**											
2199												
2200	**General Statistics**											
2201					Number of Valid Data	14					Number of Detected Data	13
2202					Number of Distinct Detected Data	13					Number of Non-Detect Data	1
2203											Percent Non-Detects	7.14%
2204												
2205	**Raw Statistics**						**Log-transformed Statistics**					
2206					Minimum Detected	0.0079					Minimum Detected	-4.841
2207					Maximum Detected	0.0354					Maximum Detected	-3.341
2208					Mean of Detected	0.023					Mean of Detected	-3.848
2209					SD of Detected	0.00832					SD of Detected	0.437
2210					Minimum Non-Detect	0.00075					Minimum Non-Detect	-7.195
2211					Maximum Non-Detect	0.00075					Maximum Non-Detect	-7.195
2212												
2213												
2214	**UCL Statistics**											
2215	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2216					Shapiro Wilk Test Statistic	0.972					Shapiro Wilk Test Statistic	0.909
2217					5% Shapiro Wilk Critical Value	0.866					5% Shapiro Wilk Critical Value	0.866
2218	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2219												
2220	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2221					DL/2 Substitution Method						DL/2 Substitution Method	
2222					Mean	0.0214					Mean	-4.137
2223					SD	0.01					SD	1.158
2224					95% DL/2 (t) UCL	0.0261					95% H-Stat (DL/2) UCL	0.0529
2225												
2226					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	

2227					Mean	0.0211					Mean in Log Scale	-3.921
2228					SD	0.0103					SD in Log Scale	0.5
2229					95% MLE (t) UCL	0.026					Mean in Original Scale	0.0219
2230					95% MLE (Tiku) UCL	0.0261					SD in Original Scale	0.00898
2231											95% Percentile Bootstrap UCL	0.0257
2232											95% BCA Bootstrap UCL	0.0257
2233												
2234	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
2235					k star (bias corrected)	5.199					**Data appear Normal at 5% Significance Level**	
2236					Theta Star	0.00443						
2237					nu star	135.2						
2238												
2239					A-D Test Statistic	0.329					**Nonparametric Statistics**	
2240					5% A-D Critical Value	0.735					Kaplan-Meier (KM) Method	
2241					K-S Test Statistic	0.735					Mean	0.0219
2242					5% K-S Critical Value	0.237					SD	0.00863
2243	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0024
2244											95% KM (t) UCL	0.0262
2245	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0259
2246	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0261
2247					Minimum	0.00456					95% KM (bootstrap t) UCL	0.0262
2248					Maximum	0.0354					95% KM (BCA) UCL	0.0261
2249					Mean	0.0217					95% KM (Percentile Bootstrap) UCL	0.0259
2250					Median	0.0221					95% KM (Chebyshev) UCL	0.0324
2251					SD	0.00939					97.5% KM (Chebyshev) UCL	0.0369
2252					k star	3.249					99% KM (Chebyshev) UCL	0.0458
2253					Theta star	0.00668						
2254					Nu star	90.97					**Potential UCLs to Use**	
2255					AppChi2	69.98					95% KM (t) UCL	0.0262
2256					95% Gamma Approximate UCL	0.0282					95% KM (Percentile Bootstrap) UCL	0.0259
2257					95% Adjusted Gamma UCL	0.0292						
2258	**Note: DL/2 is not a recommended method.**											
2259												
2260												
2261	**Hexavalent chromium (mw-35-60)**											
2262												
2263	**General Statistics**											
2264					Number of Valid Observations	13					Number of Distinct Observations	13
2265												
2266	**Raw Statistics**										**Log-transformed Statistics**	
2267					Minimum	0.0048					Minimum of Log Data	-5.339
2268					Maximum	0.0351					Maximum of Log Data	-3.35
2269					Mean	0.0274					Mean of log Data	-3.68
2270					Median	0.0286					SD of log Data	0.524
2271					SD	0.0081						
2272					Coefficient of Variation	0.295						
2273					Skewness	-1.999						
2274												
2275	**Relevant UCL Statistics**											
2276	**Normal Distribution Test**										**Lognormal Distribution Test**	
2277					Shapiro Wilk Test Statistic	0.798					Shapiro Wilk Test Statistic	0.585
2278					Shapiro Wilk Critical Value	0.866					Shapiro Wilk Critical Value	0.866
2279	**Data not Normal at 5% Significance Level**										**Data not Lognormal at 5% Significance Level**	

2280												
2281	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2282					95% Student's-t UCL	0.0314					95% H-UCL	0.04
2283	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0472
2284					95% Adjusted-CLT UCL	0.0298					97.5% Chebyshev (MVUE) UCL	0.0553
2285					95% Modified-t UCL	0.0312					99% Chebyshev (MVUE) UCL	0.0711
2286												
2287	**Gamma Distribution Test**						**Data Distribution**					
2288					k star (bias corrected)	4.748	**Data do not follow a Discernable Distribution (0.05)**					
2289					Theta Star	0.00578						
2290					nu star	123.4						
2291					Approximate Chi Square Value (.05)	98.79	**Nonparametric Statistics**					
2292					Adjusted Level of Significance	0.0301					95% CLT UCL	0.0311
2293					Adjusted Chi Square Value	95.65					95% Jackknife UCL	0.0314
2294											95% Standard Bootstrap UCL	0.031
2295					Anderson-Darling Test Statistic	1.652					95% Bootstrap-t UCL	0.0305
2296					Anderson-Darling 5% Critical Value	0.735					95% Hall's Bootstrap UCL	0.0301
2297					Kolmogorov-Smirnov Test Statistic	0.303					95% Percentile Bootstrap UCL	0.0306
2298					Kolmogorov-Smirnov 5% Critical Value	0.237					95% BCA Bootstrap UCL	0.03
2299	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.0372
2300											97.5% Chebyshev(Mean, Sd) UCL	0.0415
2301	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.0498
2302					95% Approximate Gamma UCL	0.0343						
2303					95% Adjusted Gamma UCL	0.0354						
2304												
2305	**Potential UCL to Use**										Use 95% Chebyshev (Mean, Sd) UCL	0.0372
2306	**Recommended UCL exceeds the maximum observation**											
2307												
2308												
2309	**Hexavalent chromium (mw-36-100)**											
2310												
2311	**General Statistics**											
2312					Number of Valid Observations	51					Number of Distinct Observations	50
2313												
2314	**Raw Statistics**						**Log-transformed Statistics**					
2315					Minimum	0.157					Minimum of Log Data	-1.852
2316					Maximum	2.98					Maximum of Log Data	1.092
2317					Mean	1.027					Mean of log Data	-0.323
2318					Median	0.556					SD of log Data	0.858
2319					SD	0.859						
2320					Coefficient of Variation	0.836						
2321					Skewness	0.989						
2322												
2323	**Relevant UCL Statistics**											
2324	**Normal Distribution Test**						**Lognormal Distribution Test**					
2325					Lilliefors Test Statistic	0.255					Lilliefors Test Statistic	0.146
2326					Lilliefors Critical Value	0.124					Lilliefors Critical Value	0.124
2327	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2328												
2329	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2330					95% Student's-t UCL	1.228					95% H-UCL	1.362
2331	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	1.654
2332					95% Adjusted-CLT UCL	1.243					97.5% Chebyshev (MVUE) UCL	1.921

2333				95% Modified-t UCL	1.231					99% Chebyshev (MVUE) UCL	2.446	
2334												
2335				**Gamma Distribution Test**						**Data Distribution**		
2336				k star (bias corrected)	1.497					**Data do not follow a Discernable Distribution (0.05)**		
2337				Theta Star	0.686							
2338				nu star	152.7							
2339				Approximate Chi Square Value (.05)	125.2					**Nonparametric Statistics**		
2340				Adjusted Level of Significance	0.0453					95% CLT UCL	1.225	
2341				Adjusted Chi Square Value	124.4					95% Jackknife UCL	1.228	
2342										95% Standard Bootstrap UCL	1.223	
2343				Anderson-Darling Test Statistic	1.691					95% Bootstrap-t UCL	1.246	
2344				Anderson-Darling 5% Critical Value	0.767					95% Hall's Bootstrap UCL	1.239	
2345				Kolmogorov-Smirnov Test Statistic	0.192					95% Percentile Bootstrap UCL	1.234	
2346				Kolmogorov-Smirnov 5% Critical Value	0.126					95% BCA Bootstrap UCL	1.233	
2347				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1.551	
2348										97.5% Chebyshev(Mean, Sd) UCL	1.778	
2349				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	2.224	
2350				95% Approximate Gamma UCL	1.253							
2351				95% Adjusted Gamma UCL	1.26							
2352												
2353				**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	1.551	
2354												
2355												
2356	**Hexavalent chromium (mw-36-20)**											
2357												
2358				**General Statistics**								
2359				Number of Valid Data	17					Number of Detected Data	1	
2360				Number of Distinct Detected Data	1					Number of Non-Detect Data	16	
2361										Percent Non-Detects	94.12%	
2362												
2363				**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**								
2364				**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**								
2365												
2366				**The data set for variable Hexavalent chromium (mw-36-20) was not processed!**								
2367												
2368												
2369												
2370	**Hexavalent chromium (mw-36-40)**											
2371												
2372				**General Statistics**								
2373				Number of Valid Data	17					Number of Detected Data	0	
2374				Number of Distinct Detected Data	0					Number of Non-Detect Data	17	
2375										Percent Non-Detects	100.00%	
2376												
2377				**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**								
2378				**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**								
2379				**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**								
2380												
2381				**The data set for variable Hexavalent chromium (mw-36-40) was not processed!**								
2382												
2383												
2384												
2385	**Hexavalent chromium (mw-36-50)**											

2386												
2387	**General Statistics**											
2388					Number of Valid Data	17			Number of Detected Data			0
2389					Number of Distinct Detected Data	0			Number of Non-Detect Data			17
2390									Percent Non-Detects			100.00%
2391												
2392	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2393	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
2394	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2395												
2396	**The data set for variable Hexavalent chromium (mw-36-50) was not processed!**											
2397												
2398												
2399												
2400	**Hexavalent chromium (mw-36-70)**											
2401												
2402	**General Statistics**											
2403					Number of Valid Data	26			Number of Detected Data			0
2404					Number of Distinct Detected Data	0			Number of Non-Detect Data			26
2405									Percent Non-Detects			100.00%
2406												
2407	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2408	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
2409	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2410												
2411	**The data set for variable Hexavalent chromium (mw-36-70) was not processed!**											
2412												
2413												
2414												
2415	**Hexavalent chromium (mw-36-90)**											
2416												
2417	**General Statistics**											
2418					Number of Valid Data	39			Number of Detected Data			38
2419					Number of Distinct Detected Data	35			Number of Non-Detect Data			1
2420									Percent Non-Detects			2.56%
2421												
2422	**Raw Statistics**						**Log-transformed Statistics**					
2423					Minimum Detected	0.002			Minimum Detected			-6.215
2424					Maximum Detected	3.66			Maximum Detected			1.297
2425					Mean of Detected	0.73			Mean of Detected			-2.641
2426					SD of Detected	1.16			SD of Detected			2.696
2427					Minimum Non-Detect	0.001			Minimum Non-Detect			-6.908
2428					Maximum Non-Detect	0.001			Maximum Non-Detect			-6.908
2429												
2430												
2431	**UCL Statistics**											
2432	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2433					Shapiro Wilk Test Statistic	0.667			Shapiro Wilk Test Statistic			0.868
2434					5% Shapiro Wilk Critical Value	0.938			5% Shapiro Wilk Critical Value			0.938
2435	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2436												
2437	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2438					DL/2 Substitution Method				DL/2 Substitution Method			

2439					Mean	0.711					Mean	-2.768
2440					SD	1.151					SD	2.777
2441					95% DL/2 (t) UCL	1.022					95% H-Stat (DL/2) UCL	22.31
2442												
2443					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2444					Mean	0.693					Mean in Log Scale	-2.812
2445					SD	1.156					SD in Log Scale	2.867
2446					95% MLE (t) UCL	1.005					Mean in Original Scale	0.711
2447					95% MLE (Tiku) UCL	0.978					SD in Original Scale	1.151
2448											95% Percentile Bootstrap UCL	1.01
2449											95% BCA Bootstrap UCL	1.058
2450												
2451				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
2452					k star (bias corrected)	0.291					**Data do not follow a Discernable Distribution (0.05)**	
2453					Theta Star	2.509						
2454					nu star	22.11						
2455												
2456					A-D Test Statistic	1.867					**Nonparametric Statistics**	
2457					5% A-D Critical Value	0.859					Kaplan-Meier (KM) Method	
2458					K-S Test Statistic	0.859					Mean	0.711
2459					5% K-S Critical Value	0.155					SD	1.136
2460				**Data not Gamma Distributed at 5% Significance Level**							SE of Mean	0.184
2461											95% KM (t) UCL	1.022
2462				**Assuming Gamma Distribution**							95% KM (z) UCL	1.015
2463					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.022
2464					Minimum	1E-09					95% KM (bootstrap t) UCL	1.115
2465					Maximum	3.66					95% KM (BCA) UCL	1.011
2466					Mean	0.711					95% KM (Percentile Bootstrap) UCL	1.025
2467					Median	0.033					95% KM (Chebyshev) UCL	1.515
2468					SD	1.151					97.5% KM (Chebyshev) UCL	1.862
2469					k star	0.253					99% KM (Chebyshev) UCL	2.545
2470					Theta star	2.808						
2471					Nu star	19.76					**Potential UCLs to Use**	
2472					AppChi2	10.68					99% KM (Chebyshev) UCL	2.545
2473					95% Gamma Approximate UCL	1.317						
2474					95% Adjusted Gamma UCL	1.35						
2475	**Note: DL/2 is not a recommended method.**											
2476												
2477												
2478	**Hexavalent chromium (mw-37d)**											
2479												
2480						**General Statistics**						
2481					Number of Valid Observations	15					Number of Distinct Observations	15
2482												
2483				**Raw Statistics**							**Log-transformed Statistics**	
2484					Minimum	0.834					Minimum of Log Data	-0.182
2485					Maximum	1.97					Maximum of Log Data	0.678
2486					Mean	1.417					Mean of log Data	0.318
2487					Median	1.39					SD of log Data	0.26
2488					SD	0.348						
2489					Coefficient of Variation	0.245						
2490					Skewness	-0.0379						
2491												

2492	**Relevant UCL Statistics**											
2493	**Normal Distribution Test**						**Lognormal Distribution Test**					
2494					Shapiro Wilk Test Statistic	0.955					Shapiro Wilk Test Statistic	0.936
2495					Shapiro Wilk Critical Value	0.881					Shapiro Wilk Critical Value	0.881
2496	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2497												
2498	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2499					95% Student's-t UCL	1.575					95% H-UCL	1.617
2500	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	1.838
2501					95% Adjusted-CLT UCL	1.564					97.5% Chebyshev (MVUE) UCL	2.019
2502					95% Modified-t UCL	1.575					99% Chebyshev (MVUE) UCL	2.375
2503												
2504	**Gamma Distribution Test**						**Data Distribution**					
2505					k star (bias corrected)	13.41	**Data appear Normal at 5% Significance Level**					
2506					Theta Star	0.106						
2507					nu star	402.4						
2508					Approximate Chi Square Value (.05)	356.9	**Nonparametric Statistics**					
2509					Adjusted Level of Significance	0.0324					95% CLT UCL	1.565
2510					Adjusted Chi Square Value	351.6					95% Jackknife UCL	1.575
2511											95% Standard Bootstrap UCL	1.561
2512					Anderson-Darling Test Statistic	0.343					95% Bootstrap-t UCL	1.578
2513					Anderson-Darling 5% Critical Value	0.736					95% Hall's Bootstrap UCL	1.574
2514					Kolmogorov-Smirnov Test Statistic	0.141					95% Percentile Bootstrap UCL	1.566
2515					Kolmogorov-Smirnov 5% Critical Value	0.221					95% BCA Bootstrap UCL	1.557
2516	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	1.808
2517											97.5% Chebyshev(Mean, Sd) UCL	1.978
2518	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	2.31
2519					95% Approximate Gamma UCL	1.598						
2520					95% Adjusted Gamma UCL	1.622						
2521												
2522	**Potential UCL to Use**										Use 95% Student's-t UCL	1.575
2523												
2524												
2525	**Hexavalent chromium (mw-37s)**											
2526												
2527	**General Statistics**											
2528					Number of Valid Observations	14					Number of Distinct Observations	13
2529												
2530	**Raw Statistics**						**Log-transformed Statistics**					
2531					Minimum	0.0019					Minimum of Log Data	-6.266
2532					Maximum	0.0083					Maximum of Log Data	-4.791
2533					Mean	0.00628					Mean of log Data	-5.169
2534					Median	0.00745					SD of log Data	0.52
2535					SD	0.00228						
2536					Coefficient of Variation	0.362						
2537					Skewness	-1.299						
2538												
2539	**Relevant UCL Statistics**											
2540	**Normal Distribution Test**						**Lognormal Distribution Test**					
2541					Shapiro Wilk Test Statistic	0.75					Shapiro Wilk Test Statistic	0.683
2542					Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value	0.874
2543	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2544												

2545	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2546				95% Student's-t UCL	0.00736					95% H-UCL	0.00874	
2547	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.0105	
2548				95% Adjusted-CLT UCL	0.00705					97.5% Chebyshev (MVUE) UCL	0.0122	
2549				95% Modified-t UCL	0.00732					99% Chebyshev (MVUE) UCL	0.0156	
2550												
2551	**Gamma Distribution Test**						**Data Distribution**					
2552				k star (bias corrected)	4.147		**Data do not follow a Discernable Distribution (0.05)**					
2553				Theta Star	0.00151							
2554				nu star	116.1							
2555				Approximate Chi Square Value (.05)	92.24		**Nonparametric Statistics**					
2556				Adjusted Level of Significance	0.0312					95% CLT UCL	0.00728	
2557				Adjusted Chi Square Value	89.42					95% Jackknife UCL	0.00736	
2558										95% Standard Bootstrap UCL	0.00723	
2559				Anderson-Darling Test Statistic	1.979					95% Bootstrap-t UCL	0.00721	
2560				Anderson-Darling 5% Critical Value	0.738					95% Hall's Bootstrap UCL	0.00706	
2561				Kolmogorov-Smirnov Test Statistic	0.298					95% Percentile Bootstrap UCL	0.00718	
2562				Kolmogorov-Smirnov 5% Critical Value	0.229					95% BCA Bootstrap UCL	0.00708	
2563	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.00893	
2564										97.5% Chebyshev(Mean, Sd) UCL	0.0101	
2565	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.0123	
2566				95% Approximate Gamma UCL	0.0079							
2567				95% Adjusted Gamma UCL	0.00815							
2568												
2569	**Potential UCL to Use**									Use 95% Chebyshev (Mean, Sd) UCL	0.00893	
2570	**Recommended UCL exceeds the maximum observation**											
2571												
2572												
2573	**Hexavalent chromium (mw-38d)**											
2574												
2575	**General Statistics**											
2576				Number of Valid Observations	11					Number of Distinct Observations	10	
2577												
2578	**Raw Statistics**						**Log-transformed Statistics**					
2579				Minimum	0.0331					Minimum of Log Data	-3.408	
2580				Maximum	0.328					Maximum of Log Data	-1.115	
2581				Mean	0.164					Mean of log Data	-2.014	
2582				Median	0.111					SD of log Data	0.717	
2583				SD	0.1							
2584				Coefficient of Variation	0.611							
2585				Skewness	0.374							
2586												
2587	**Relevant UCL Statistics**											
2588	**Normal Distribution Test**						**Lognormal Distribution Test**					
2589				Shapiro Wilk Test Statistic	0.912					Shapiro Wilk Test Statistic	0.932	
2590				Shapiro Wilk Critical Value	0.85					Shapiro Wilk Critical Value	0.85	
2591	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2592												
2593	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2594				95% Student's-t UCL	0.219					95% H-UCL	0.304	
2595	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.332	
2596				95% Adjusted-CLT UCL	0.217					97.5% Chebyshev (MVUE) UCL	0.403	
2597				95% Modified-t UCL	0.219					99% Chebyshev (MVUE) UCL	0.543	

2598												
2599	**Gamma Distribution Test**						**Data Distribution**					
2600					k star (bias corrected)	1.936	**Data appear Normal at 5% Significance Level**					
2601					Theta Star	0.0847						
2602					nu star	42.59						
2603					Approximate Chi Square Value (.05)	28.63	**Nonparametric Statistics**					
2604					Adjusted Level of Significance	0.0278					95% CLT UCL	0.214
2605					Adjusted Chi Square Value	26.77					95% Jackknife UCL	0.219
2606											95% Standard Bootstrap UCL	0.211
2607					Anderson-Darling Test Statistic	0.383					95% Bootstrap-t UCL	0.221
2608					Anderson-Darling 5% Critical Value	0.736					95% Hall's Bootstrap UCL	0.21
2609					Kolmogorov-Smirnov Test Statistic	0.191					95% Percentile Bootstrap UCL	0.213
2610					Kolmogorov-Smirnov 5% Critical Value	0.258					95% BCA Bootstrap UCL	0.218
2611	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.296
2612											97.5% Chebyshev(Mean, Sd) UCL	0.353
2613	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.465
2614					95% Approximate Gamma UCL	0.244						
2615					95% Adjusted Gamma UCL	0.261						
2616												
2617	**Potential UCL to Use**										Use 95% Student's-t UCL	0.219
2618												
2619												
2620	**Hexavalent chromium (mw-38s)**											
2621												
2622	**General Statistics**											
2623					Number of Valid Observations	11					Number of Distinct Observations	11
2624												
2625	**Raw Statistics**						**Log-transformed Statistics**					
2626					Minimum	0.332					Minimum of Log Data	-1.103
2627					Maximum	0.964					Maximum of Log Data	-0.0367
2628					Mean	0.781					Mean of log Data	-0.286
2629					Median	0.824					SD of log Data	0.32
2630					SD	0.191						
2631					Coefficient of Variation	0.245						
2632					Skewness	-1.716						
2633												
2634	**Relevant UCL Statistics**											
2635	**Normal Distribution Test**						**Lognormal Distribution Test**					
2636					Shapiro Wilk Test Statistic	0.784					Shapiro Wilk Test Statistic	0.7
2637					Shapiro Wilk Critical Value	0.85					Shapiro Wilk Critical Value	0.85
2638	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2639												
2640	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2641					95% Student's-t UCL	0.886					95% H-UCL	0.965
2642	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	1.121
2643					95% Adjusted-CLT UCL	0.844					97.5% Chebyshev (MVUE) UCL	1.266
2644					95% Modified-t UCL	0.881					99% Chebyshev (MVUE) UCL	1.55
2645												
2646	**Gamma Distribution Test**						**Data Distribution**					
2647					k star (bias corrected)	9.563	**Data do not follow a Discernable Distribution (0.05)**					
2648					Theta Star	0.0817						
2649					nu star	210.4						
2650					Approximate Chi Square Value (.05)	177.8	**Nonparametric Statistics**					

2651				Adjusted Level of Significance	0.0278					95% CLT UCL	0.876	
2652				Adjusted Chi Square Value	172.9					95% Jackknife UCL	0.886	
2653										95% Standard Bootstrap UCL	0.87	
2654				Anderson-Darling Test Statistic	1.356					95% Bootstrap-t UCL	0.862	
2655				Anderson-Darling 5% Critical Value	0.729					95% Hall's Bootstrap UCL	0.849	
2656				Kolmogorov-Smirnov Test Statistic	0.345					95% Percentile Bootstrap UCL	0.864	
2657				Kolmogorov-Smirnov 5% Critical Value	0.255					95% BCA Bootstrap UCL	0.854	
2658				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1.033	
2659										97.5% Chebyshev(Mean, Sd) UCL	1.141	
2660				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	1.355	
2661				95% Approximate Gamma UCL	0.924							
2662				95% Adjusted Gamma UCL	0.95							
2663												
2664				**Potential UCL to Use**						Use 95% Student's-t UCL	0.886	
2665										or 95% Modified-t UCL	0.881	
2666												
2667												
2668	**Hexavalent chromium (mw-39-100)**											
2669												
2670					**General Statistics**							
2671				Number of Valid Observations	41					Number of Distinct Observations	40	
2672												
2673				**Raw Statistics**						**Log-transformed Statistics**		
2674				Minimum	1.66					Minimum of Log Data	0.507	
2675				Maximum	12.9					Maximum of Log Data	2.557	
2676				Mean	5.536					Mean of log Data	1.535	
2677				Median	4.01					SD of log Data	0.597	
2678				SD	3.428							
2679				Coefficient of Variation	0.619							
2680				Skewness	0.9							
2681												
2682					**Relevant UCL Statistics**							
2683				**Normal Distribution Test**						**Lognormal Distribution Test**		
2684				Shapiro Wilk Test Statistic	0.832					Shapiro Wilk Test Statistic	0.921	
2685				Shapiro Wilk Critical Value	0.941					Shapiro Wilk Critical Value	0.941	
2686				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
2687												
2688				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
2689				95% Student's-t UCL	6.437					95% H-UCL	6.675	
2690				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	7.906	
2691				95% Adjusted-CLT UCL	6.497					97.5% Chebyshev (MVUE) UCL	8.941	
2692				95% Modified-t UCL	6.45					99% Chebyshev (MVUE) UCL	10.97	
2693												
2694				**Gamma Distribution Test**						**Data Distribution**		
2695				k star (bias corrected)	2.785					**Data do not follow a Discernable Distribution (0.05)**		
2696				Theta Star	1.988							
2697				nu star	228.4							
2698				Approximate Chi Square Value (.05)	194.4					**Nonparametric Statistics**		
2699				Adjusted Level of Significance	0.0441					95% CLT UCL	6.417	
2700				Adjusted Chi Square Value	193.2					95% Jackknife UCL	6.437	
2701										95% Standard Bootstrap UCL	6.41	
2702				Anderson-Darling Test Statistic	1.604					95% Bootstrap-t UCL	6.513	
2703				Anderson-Darling 5% Critical Value	0.755					95% Hall's Bootstrap UCL	6.537	

2704					Kolmogorov-Smirnov Test Statistic	0.188				95% Percentile Bootstrap UCL		6.376
2705					Kolmogorov-Smirnov 5% Critical Value	0.139				95% BCA Bootstrap UCL		6.447
2706					**Data not Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL		7.87
2707										97.5% Chebyshev(Mean, Sd) UCL		8.88
2708					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL		10.86
2709					95% Approximate Gamma UCL	6.504						
2710					95% Adjusted Gamma UCL	6.542						
2711												
2712					**Potential UCL to Use**					Use 95% Chebyshev (Mean, Sd) UCL		7.87
2713												
2714												
2715	**Hexavalent chromium (mw-39-40)**											
2716												
2717					**General Statistics**							
2718					Number of Valid Data	21				Number of Detected Data		0
2719					Number of Distinct Detected Data	0				Number of Non-Detect Data		21
2720										Percent Non-Detects		100.00%
2721												
2722					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
2723					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
2724					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
2725												
2726					**The data set for variable Hexavalent chromium (mw-39-40) was not processed!**							
2727												
2728												
2729												
2730	**Hexavalent chromium (mw-39-50)**											
2731												
2732					**General Statistics**							
2733					Number of Valid Data	18				Number of Detected Data		12
2734					Number of Distinct Detected Data	12				Number of Non-Detect Data		6
2735										Percent Non-Detects		33.33%
2736												
2737					**Raw Statistics**					**Log-transformed Statistics**		
2738					Minimum Detected	0.0662				Minimum Detected		-2.715
2739					Maximum Detected	4.14				Maximum Detected		1.421
2740					Mean of Detected	1.61				Mean of Detected		-0.0752
2741					SD of Detected	1.394				SD of Detected		1.293
2742					Minimum Non-Detect	0.0002				Minimum Non-Detect		-8.517
2743					Maximum Non-Detect	0.01				Maximum Non-Detect		-4.605
2744												
2745	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		6
2746	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		12
2747	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		33.33%
2748												
2749					**UCL Statistics**							
2750					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
2751					Shapiro Wilk Test Statistic	0.909				Shapiro Wilk Test Statistic		0.928
2752					5% Shapiro Wilk Critical Value	0.859				5% Shapiro Wilk Critical Value		0.859
2753					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
2754												
2755					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
2756					DL/2 Substitution Method					DL/2 Substitution Method		

2757					Mean	1.074					Mean	-2.507
2758					SD	1.366					SD	3.81
2759					95% DL/2 (t) UCL	1.634					95% H-Stat (DL/2) UCL	7882
2760												
2761					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2762					Mean	0.666					Mean in Log Scale	-1.085
2763					SD	1.814					SD in Log Scale	1.821
2764					95% MLE (t) UCL	1.41					Mean in Original Scale	1.09
2765					95% MLE (Tiku) UCL	1.468					SD in Original Scale	1.353
2766											95% Percentile Bootstrap UCL	1.618
2767											95% BCA Bootstrap UCL	1.698
2768												
2769				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
2770					k star (bias corrected)	0.837					**Data appear Normal at 5% Significance Level**	
2771					Theta Star	1.925						
2772					nu star	20.08						
2773												
2774					A-D Test Statistic	0.237					**Nonparametric Statistics**	
2775					5% A-D Critical Value	0.756					Kaplan-Meier (KM) Method	
2776					K-S Test Statistic	0.756					Mean	1.096
2777					5% K-S Critical Value	0.252					SD	1.31
2778				**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean	0.323
2779											95% KM (t) UCL	1.657
2780				**Assuming Gamma Distribution**							95% KM (z) UCL	1.626
2781					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.623
2782					Minimum	0.0662					95% KM (bootstrap t) UCL	1.842
2783					Maximum	4.14					95% KM (BCA) UCL	1.746
2784					Mean	1.217					95% KM (Percentile Bootstrap) UCL	1.682
2785					Median	0.76					95% KM (Chebyshev) UCL	2.502
2786					SD	1.274					97.5% KM (Chebyshev) UCL	3.11
2787					k star	0.764					99% KM (Chebyshev) UCL	4.305
2788					Theta star	1.593						
2789					Nu star	27.51					**Potential UCLs to Use**	
2790					AppChi2	16.54					95% KM (t) UCL	1.657
2791					95% Gamma Approximate UCL	2.024					95% KM (Percentile Bootstrap) UCL	1.682
2792					95% Adjusted Gamma UCL	2.129						
2793	**Note: DL/2 is not a recommended method.**											
2794												
2795												
2796	**Hexavalent chromium (mw-39-60)**											
2797												
2798							**General Statistics**					
2799					Number of Valid Data	18					Number of Detected Data	16
2800					Number of Distinct Detected Data	16					Number of Non-Detect Data	2
2801											Percent Non-Detects	11.11%
2802												
2803				**Raw Statistics**							**Log-transformed Statistics**	
2804					Minimum Detected	0.0011					Minimum Detected	-6.812
2805					Maximum Detected	3.81					Maximum Detected	1.338
2806					Mean of Detected	1.61					Mean of Detected	-0.773
2807					SD of Detected	1.435					SD of Detected	2.519
2808					Minimum Non-Detect	0.0002					Minimum Non-Detect	-8.517
2809					Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908

2810												
2811	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	2
2812	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	16
2813	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	11.11%
2814												
2815	**UCL Statistics**											
2816	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2817	Shapiro Wilk Test Statistic				0.883		Shapiro Wilk Test Statistic					0.81
2818	5% Shapiro Wilk Critical Value				0.887		5% Shapiro Wilk Critical Value					0.887
2819	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2820												
2821	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2822	DL/2 Substitution Method						DL/2 Substitution Method					
2823	Mean				1.431		Mean					-1.621
2824	SD				1.445		SD					3.43
2825	95% DL/2 (t) UCL				2.024		95% H-Stat (DL/2) UCL					6286
2826												
2827	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
2828	Mean				1.337		Mean in Log Scale					-1.349
2829	SD				1.54		SD in Log Scale					2.9
2830	95% MLE (t) UCL				1.968		Mean in Original Scale					1.431
2831	95% MLE (Tiku) UCL				1.956		SD in Original Scale					1.445
2832							95% Percentile Bootstrap UCL					1.965
2833							95% BCA Bootstrap UCL					2.058
2834												
2835	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2836	k star (bias corrected)				0.454		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
2837	Theta Star				3.547							
2838	nu star				14.52							
2839												
2840	A-D Test Statistic				0.815		**Nonparametric Statistics**					
2841	5% A-D Critical Value				0.796		Kaplan-Meier (KM) Method					
2842	K-S Test Statistic				0.796		Mean					1.431
2843	5% K-S Critical Value				0.227		SD					1.404
2844	**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean					0.342
2845							95% KM (t) UCL					2.026
2846	**Assuming Gamma Distribution**						95% KM (z) UCL					1.993
2847	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					2.023
2848	Minimum				0.0011		95% KM (bootstrap t) UCL					2.046
2849	Maximum				3.81		95% KM (BCA) UCL					2.028
2850	Mean				1.445		95% KM (Percentile Bootstrap) UCL					1.966
2851	Median				1.182		95% KM (Chebyshev) UCL					2.921
2852	SD				1.431		97.5% KM (Chebyshev) UCL					3.566
2853	k star				0.45		99% KM (Chebyshev) UCL					4.833
2854	Theta star				3.214							
2855	Nu star				16.19		**Potential UCLs to Use**					
2856	AppChi2				8.094		95% KM (Chebyshev) UCL					2.921
2857	95% Gamma Approximate UCL				2.89							
2858	95% Adjusted Gamma UCL				3.099							
2859	**Note: DL/2 is not a recommended method.**											
2860												
2861												
2862	**Hexavalent chromium (mw-39-70)**											

2863												
2864	**General Statistics**											
2865					Number of Valid Observations	27				Number of Distinct Observations	27	
2866												
2867	**Raw Statistics**						**Log-transformed Statistics**					
2868					Minimum	0.0045				Minimum of Log Data	-5.404	
2869					Maximum	8.21				Maximum of Log Data	2.105	
2870					Mean	2.336				Mean of log Data	-0.617	
2871					Median	0.799				SD of log Data	2.221	
2872					SD	2.851						
2873					Coefficient of Variation	1.22						
2874					Skewness	0.856						
2875												
2876	**Relevant UCL Statistics**											
2877	**Normal Distribution Test**						**Lognormal Distribution Test**					
2878					Shapiro Wilk Test Statistic	0.769				Shapiro Wilk Test Statistic	0.908	
2879					Shapiro Wilk Critical Value	0.923				Shapiro Wilk Critical Value	0.923	
2880	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2881												
2882	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2883					95% Student's-t UCL	3.272				95% H-UCL	40.8	
2884	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	17.08	
2885					95% Adjusted-CLT UCL	3.335				97.5% Chebyshev (MVUE) UCL	22.34	
2886					95% Modified-t UCL	3.287				99% Chebyshev (MVUE) UCL	32.69	
2887												
2888	**Gamma Distribution Test**						**Data Distribution**					
2889					k star (bias corrected)	0.418	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
2890					Theta Star	5.595						
2891					nu star	22.55						
2892					Approximate Chi Square Value (.05)	12.75	**Nonparametric Statistics**					
2893					Adjusted Level of Significance	0.0401				95% CLT UCL	3.239	
2894					Adjusted Chi Square Value	12.28				95% Jackknife UCL	3.272	
2895										95% Standard Bootstrap UCL	3.224	
2896					Anderson-Darling Test Statistic	0.991				95% Bootstrap-t UCL	3.42	
2897					Anderson-Darling 5% Critical Value	0.821				95% Hall's Bootstrap UCL	3.257	
2898					Kolmogorov-Smirnov Test Statistic	0.169				95% Percentile Bootstrap UCL	3.256	
2899					Kolmogorov-Smirnov 5% Critical Value	0.179				95% BCA Bootstrap UCL	3.337	
2900	**Data follow Appr. Gamma Distribution at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	4.728	
2901										97.5% Chebyshev(Mean, Sd) UCL	5.763	
2902	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	7.796	
2903					95% Approximate Gamma UCL	4.132						
2904					95% Adjusted Gamma UCL	4.29						
2905												
2906	**Potential UCL to Use**									Use 95% Adjusted Gamma UCL	4.29	
2907												
2908												
2909	**Hexavalent chromium (mw-39-80)**											
2910												
2911	**General Statistics**											
2912					Number of Valid Observations	40				Number of Distinct Observations	40	
2913												
2914	**Raw Statistics**						**Log-transformed Statistics**					
2915					Minimum	0.0433				Minimum of Log Data	-3.14	

2916					Maximum	10.9					Maximum of Log Data	2.389
2917					Mean	3.033					Mean of log Data	0.14
2918					Median	1.585					SD of log Data	1.691
2919					SD	3.448						
2920					Coefficient of Variation	1.137						
2921					Skewness	1.105						
2922												
2923	**Relevant UCL Statistics**											
2924	**Normal Distribution Test**						**Lognormal Distribution Test**					
2925					Shapiro Wilk Test Statistic	0.784					Shapiro Wilk Test Statistic	0.917
2926					Shapiro Wilk Critical Value	0.94					Shapiro Wilk Critical Value	0.94
2927	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2928												
2929	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2930					95% Student's-t UCL	3.952					95% H-UCL	11.49
2931	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	11.4
2932					95% Adjusted-CLT UCL	4.032					97.5% Chebyshev (MVUE) UCL	14.42
2933					95% Modified-t UCL	3.968					99% Chebyshev (MVUE) UCL	20.34
2934												
2935	**Gamma Distribution Test**						**Data Distribution**					
2936					k star (bias corrected)	0.602	**Data appear Gamma Distributed at 5% Significance Level**					
2937					Theta Star	5.042						
2938					nu star	48.13						
2939					Approximate Chi Square Value (.05)	33.2	**Nonparametric Statistics**					
2940					Adjusted Level of Significance	0.044					95% CLT UCL	3.93
2941					Adjusted Chi Square Value	32.74					95% Jackknife UCL	3.952
2942											95% Standard Bootstrap UCL	3.917
2943					Anderson-Darling Test Statistic	0.62					95% Bootstrap-t UCL	4.038
2944					Anderson-Darling 5% Critical Value	0.8					95% Hall's Bootstrap UCL	4.011
2945					Kolmogorov-Smirnov Test Statistic	0.117					95% Percentile Bootstrap UCL	3.899
2946					Kolmogorov-Smirnov 5% Critical Value	0.146					95% BCA Bootstrap UCL	3.992
2947	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	5.41
2948											97.5% Chebyshev(Mean, Sd) UCL	6.438
2949	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	8.458
2950					95% Approximate Gamma UCL	4.397						
2951					95% Adjusted Gamma UCL	4.459						
2952												
2953	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	4.397
2954												
2955												
2956	**Hexavalent chromium (mw-4)**											
2957												
2958	**General Statistics**											
2959					Number of Valid Observations	6					Number of Distinct Observations	6
2960												
2961	**Raw Statistics**						**Log-transformed Statistics**					
2962					Minimum	0.0191					Minimum of Log Data	-3.958
2963					Maximum	0.022					Maximum of Log Data	-3.817
2964					Mean	0.0203					Mean of log Data	-3.901
2965					Median	0.0201					SD of log Data	0.054
2966					SD	0.00111						
2967					Coefficient of Variation	0.0546						
2968					Skewness	0.685						

	A	B	C	D	E	F	G	H	I	J	K	L
2969												
2970												
2971	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
2972												
2973	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
2974	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2975												
2976												
2977	**Warning: There are only 6 Values in this data**											
2978	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
2979	**the resulting calculations may not be reliable enough to draw conclusions**											
2980												
2981	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
2982												
2983	**Relevant UCL Statistics**											
2984	**Normal Distribution Test**						**Lognormal Distribution Test**					
2985	Shapiro Wilk Test Statistic					0.932	Shapiro Wilk Test Statistic					0.936
2986	Shapiro Wilk Critical Value					0.788	Shapiro Wilk Critical Value					0.788
2987	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2988												
2989	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2990	95% Student's-t UCL					0.0212	95% H-UCL					N/A
2991	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0222
2992	95% Adjusted-CLT UCL					0.0211	97.5% Chebyshev (MVUE) UCL					0.023
2993	95% Modified-t UCL					0.0212	99% Chebyshev (MVUE) UCL					0.0247
2994												
2995	**Gamma Distribution Test**						**Data Distribution**					
2996	k star (bias corrected)					204.3	**Data appear Normal at 5% Significance Level**					
2997	Theta Star					9.914E-05						
2998	nu star					2451						
2999	Approximate Chi Square Value (.05)					2337	**Nonparametric Statistics**					
3000	Adjusted Level of Significance					0.0122	95% CLT UCL					0.021
3001	Adjusted Chi Square Value					2296	95% Jackknife UCL					0.0212
3002							95% Standard Bootstrap UCL					0.0209
3003	Anderson-Darling Test Statistic					0.276	95% Bootstrap-t UCL					0.0216
3004	Anderson-Darling 5% Critical Value					0.696	95% Hall's Bootstrap UCL					0.0221
3005	Kolmogorov-Smirnov Test Statistic					0.186	95% Percentile Bootstrap UCL					0.0209
3006	Kolmogorov-Smirnov 5% Critical Value					0.332	95% BCA Bootstrap UCL					0.021
3007	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.0222
3008							97.5% Chebyshev(Mean, Sd) UCL					0.0231
3009	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.0247
3010	95% Approximate Gamma UCL					0.0212						
3011	95% Adjusted Gamma UCL					0.0216						
3012												
3013	**Potential UCL to Use**						Use 95% Student's-t UCL					0.0212
3014												
3015												
3016	**Hexavalent chromium (mw-40d)**											
3017												
3018	**General Statistics**											
3019	Number of Valid Observations					15	Number of Distinct Observations					14
3020												
3021	**Raw Statistics**						**Log-transformed Statistics**					

3022					Minimum	0.0076					Minimum of Log Data	-4.88
3023					Maximum	0.112					Maximum of Log Data	-2.189
3024					Mean	0.068					Mean of log Data	-2.87
3025					Median	0.078					SD of log Data	0.73
3026					SD	0.0336						
3027					Coefficient of Variation	0.495						
3028					Skewness	-0.268						
3029												
3030	**Relevant UCL Statistics**											
3031	**Normal Distribution Test**						**Lognormal Distribution Test**					
3032					Shapiro Wilk Test Statistic	0.936					Shapiro Wilk Test Statistic	0.836
3033					Shapiro Wilk Critical Value	0.881					Shapiro Wilk Critical Value	0.881
3034	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3035												
3036	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3037					95% Student's-t UCL	0.0833					95% H-UCL	0.117
3038	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.135
3039					95% Adjusted-CLT UCL	0.0817					97.5% Chebyshev (MVUE) UCL	0.163
3040					95% Modified-t UCL	0.0832					99% Chebyshev (MVUE) UCL	0.216
3041												
3042	**Gamma Distribution Test**						**Data Distribution**					
3043					k star (bias corrected)	2.362	**Data appear Normal at 5% Significance Level**					
3044					Theta Star	0.0288						
3045					nu star	70.85						
3046					Approximate Chi Square Value (.05)	52.47	**Nonparametric Statistics**					
3047					Adjusted Level of Significance	0.0324					95% CLT UCL	0.0823
3048					Adjusted Chi Square Value	50.53					95% Jackknife UCL	0.0833
3049											95% Standard Bootstrap UCL	0.0821
3050					Anderson-Darling Test Statistic	0.573					95% Bootstrap-t UCL	0.0827
3051					Anderson-Darling 5% Critical Value	0.745					95% Hall's Bootstrap UCL	0.0816
3052					Kolmogorov-Smirnov Test Statistic	0.201					95% Percentile Bootstrap UCL	0.082
3053					Kolmogorov-Smirnov 5% Critical Value	0.223					95% BCA Bootstrap UCL	0.0818
3054	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.106
3055											97.5% Chebyshev(Mean, Sd) UCL	0.122
3056	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.154
3057					95% Approximate Gamma UCL	0.0919						
3058					95% Adjusted Gamma UCL	0.0954						
3059												
3060	**Potential UCL to Use**										Use 95% Student's-t UCL	0.0833
3061												
3062												
3063	**Hexavalent chromium (mw-40s)**											
3064												
3065	**General Statistics**											
3066					Number of Valid Observations	13					Number of Distinct Observations	11
3067												
3068	**Raw Statistics**						**Log-transformed Statistics**					
3069					Minimum	0.0021					Minimum of Log Data	-6.166
3070					Maximum	0.0082					Maximum of Log Data	-4.804
3071					Mean	0.00545					Mean of log Data	-5.254
3072					Median	0.0052					SD of log Data	0.325
3073					SD	0.00149						
3074					Coefficient of Variation	0.273						

3075					Skewness	-0.19						
3076												
3077	**Relevant UCL Statistics**											
3078	**Normal Distribution Test**						**Lognormal Distribution Test**					
3079					Shapiro Wilk Test Statistic	0.907					Shapiro Wilk Test Statistic	0.808
3080					Shapiro Wilk Critical Value	0.866					Shapiro Wilk Critical Value	0.866
3081	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3082												
3083	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3084					95% Student's-t UCL	0.00619					95% H-UCL	0.00661
3085	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.00767
3086					95% Adjusted-CLT UCL	0.00611					97.5% Chebyshev (MVUE) UCL	0.00862
3087					95% Modified-t UCL	0.00619					99% Chebyshev (MVUE) UCL	0.0105
3088												
3089	**Gamma Distribution Test**						**Data Distribution**					
3090					k star (bias corrected)	9.281	**Data appear Normal at 5% Significance Level**					
3091					Theta Star	0.0005876						
3092					nu star	241.3						
3093					Approximate Chi Square Value (.05)	206.3	**Nonparametric Statistics**					
3094					Adjusted Level of Significance	0.0301					95% CLT UCL	0.00613
3095					Adjusted Chi Square Value	201.7					95% Jackknife UCL	0.00619
3096											95% Standard Bootstrap UCL	0.00611
3097					Anderson-Darling Test Statistic	0.79					95% Bootstrap-t UCL	0.00619
3098					Anderson-Darling 5% Critical Value	0.734					95% Hall's Bootstrap UCL	0.00634
3099					Kolmogorov-Smirnov Test Statistic	0.24					95% Percentile Bootstrap UCL	0.00608
3100					Kolmogorov-Smirnov 5% Critical Value	0.237					95% BCA Bootstrap UCL	0.00605
3101	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.00725
3102											97.5% Chebyshev(Mean, Sd) UCL	0.00803
3103	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.00956
3104					95% Approximate Gamma UCL	0.00638						
3105					95% Adjusted Gamma UCL	0.00652						
3106												
3107	**Potential UCL to Use**										Use 95% Student's-t UCL	0.00619
3108												
3109												
3110	**Hexavalent chromium (mw-41d)**											
3111												
3112	**General Statistics**											
3113					Number of Valid Data	11					Number of Detected Data	0
3114					Number of Distinct Detected Data	0					Number of Non-Detect Data	11
3115											Percent Non-Detects	100.00%
3116												
3117	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
3118	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
3119	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
3120												
3121	**The data set for variable Hexavalent chromium (mw-41d) was not processed!**											
3122												
3123												
3124												
3125	**Hexavalent chromium (mw-41m)**											
3126												
3127	**General Statistics**											

3128					Number of Valid Observations	11					Number of Distinct Observations	10
3129												
3130					**Raw Statistics**						**Log-transformed Statistics**	
3131					Minimum	0.0041					Minimum of Log Data	-5.497
3132					Maximum	0.0105					Maximum of Log Data	-4.556
3133					Mean	0.00772					Mean of log Data	-4.914
3134					Median	0.0085					SD of log Data	0.343
3135					SD	0.00238						
3136					Coefficient of Variation	0.309						
3137					Skewness	-0.365						
3138												
3139					**Relevant UCL Statistics**							
3140					**Normal Distribution Test**						**Lognormal Distribution Test**	
3141					Shapiro Wilk Test Statistic	0.883					Shapiro Wilk Test Statistic	0.864
3142					Shapiro Wilk Critical Value	0.85					Shapiro Wilk Critical Value	0.85
3143					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
3144												
3145					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3146					95% Student's-t UCL	0.00902					95% H-UCL	0.00966
3147					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0113
3148					95% Adjusted-CLT UCL	0.00882					97.5% Chebyshev (MVUE) UCL	0.0128
3149					95% Modified-t UCL	0.00901					99% Chebyshev (MVUE) UCL	0.0158
3150												
3151					**Gamma Distribution Test**						**Data Distribution**	
3152					k star (bias corrected)	7.485					**Data appear Normal at 5% Significance Level**	
3153					Theta Star	0.00103						
3154					nu star	164.7						
3155					Approximate Chi Square Value (.05)	136					**Nonparametric Statistics**	
3156					Adjusted Level of Significance	0.0278					95% CLT UCL	0.0089
3157					Adjusted Chi Square Value	131.7					95% Jackknife UCL	0.00902
3158											95% Standard Bootstrap UCL	0.00886
3159					Anderson-Darling Test Statistic	0.69					95% Bootstrap-t UCL	0.00889
3160					Anderson-Darling 5% Critical Value	0.729					95% Hall's Bootstrap UCL	0.00877
3161					Kolmogorov-Smirnov Test Statistic	0.239					95% Percentile Bootstrap UCL	0.00889
3162					Kolmogorov-Smirnov 5% Critical Value	0.255					95% BCA Bootstrap UCL	0.00876
3163					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0109
3164											97.5% Chebyshev(Mean, Sd) UCL	0.0122
3165					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0149
3166					95% Approximate Gamma UCL	0.00935						
3167					95% Adjusted Gamma UCL	0.00965						
3168												
3169					**Potential UCL to Use**						Use 95% Student's-t UCL	0.00902
3170												
3171												
3172	**Hexavalent chromium (mw-41s)**											
3173												
3174					**General Statistics**							
3175					Number of Valid Observations	11					Number of Distinct Observations	10
3176												
3177					**Raw Statistics**						**Log-transformed Statistics**	
3178					Minimum	0.0074					Minimum of Log Data	-4.906
3179					Maximum	0.0199					Maximum of Log Data	-3.917
3180					Mean	0.0163					Mean of log Data	-4.158

3181					Median	0.0176					SD of log Data	0.317
3182					SD	0.00418						
3183					Coefficient of Variation	0.257						
3184					Skewness	-1.247						
3185												
3186					**Relevant UCL Statistics**							
3187					**Normal Distribution Test**						**Lognormal Distribution Test**	
3188					Shapiro Wilk Test Statistic	0.814					Shapiro Wilk Test Statistic	0.763
3189					Shapiro Wilk Critical Value	0.85					Shapiro Wilk Critical Value	0.85
3190					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
3191												
3192					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3193					95% Student's-t UCL	0.0185					95% H-UCL	0.02
3194					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0232
3195					95% Adjusted-CLT UCL	0.0178					97.5% Chebyshev (MVUE) UCL	0.0262
3196					95% Modified-t UCL	0.0185					99% Chebyshev (MVUE) UCL	0.032
3197												
3198					**Gamma Distribution Test**						**Data Distribution**	
3199					k star (bias corrected)	9.379					**Data do not follow a Discernable Distribution (0.05)**	
3200					Theta Star	0.00173						
3201					nu star	206.3						
3202					Approximate Chi Square Value (.05)	174.1					**Nonparametric Statistics**	
3203					Adjusted Level of Significance	0.0278					95% CLT UCL	0.0183
3204					Adjusted Chi Square Value	169.3					95% Jackknife UCL	0.0185
3205											95% Standard Bootstrap UCL	0.0182
3206					Anderson-Darling Test Statistic	1.088					95% Bootstrap-t UCL	0.0181
3207					Anderson-Darling 5% Critical Value	0.729					95% Hall's Bootstrap UCL	0.0178
3208					Kolmogorov-Smirnov Test Statistic	0.31					95% Percentile Bootstrap UCL	0.0182
3209					Kolmogorov-Smirnov 5% Critical Value	0.255					95% BCA Bootstrap UCL	0.0178
3210					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0218
3211											97.5% Chebyshev(Mean, Sd) UCL	0.0241
3212					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0288
3213					95% Approximate Gamma UCL	0.0193						
3214					95% Adjusted Gamma UCL	0.0198						
3215												
3216					**Potential UCL to Use**						Use 95% Student's-t UCL	0.0185
3217											or 95% Modified-t UCL	0.0185
3218												
3219												
3220	**Hexavalent chromium (mw-42-30)**											
3221												
3222					**General Statistics**							
3223					Number of Valid Data	9					Number of Detected Data	0
3224					Number of Distinct Detected Data	0					Number of Non-Detect Data	9
3225											Percent Non-Detects	100.00%
3226												
3227	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
3228	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
3229	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
3230												
3231	**The data set for variable Hexavalent chromium (mw-42-30) was not processed!**											
3232												
3233												

	A	B	C	D	E	F	G	H	I	J	K	L
3234												
3235	**Hexavalent chromium (mw-42-55)**											
3236												
3237	**General Statistics**											
3238					Number of Valid Data	12			Number of Detected Data			0
3239					Number of Distinct Detected Data	0			Number of Non-Detect Data			12
3240									Percent Non-Detects			100.00%
3241												
3242	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
3243	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
3244	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
3245												
3246	**The data set for variable Hexavalent chromium (mw-42-55) was not processed!**											
3247												
3248												
3249												
3250	**Hexavalent chromium (mw-42-65)**											
3251												
3252	**General Statistics**											
3253					Number of Valid Data	12			Number of Detected Data			0
3254					Number of Distinct Detected Data	0			Number of Non-Detect Data			12
3255									Percent Non-Detects			100.00%
3256												
3257	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
3258	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
3259	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
3260												
3261	**The data set for variable Hexavalent chromium (mw-42-65) was not processed!**											
3262												
3263												
3264												
3265	**Hexavalent chromium (mw-43-25)**											
3266												
3267	**General Statistics**											
3268					Number of Valid Data	10			Number of Detected Data			0
3269					Number of Distinct Detected Data	0			Number of Non-Detect Data			10
3270									Percent Non-Detects			100.00%
3271												
3272	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
3273	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
3274	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
3275												
3276	**The data set for variable Hexavalent chromium (mw-43-25) was not processed!**											
3277												
3278												
3279												
3280	**Hexavalent chromium (mw-43-75)**											
3281												
3282	**General Statistics**											
3283					Number of Valid Data	19			Number of Detected Data			0
3284					Number of Distinct Detected Data	0			Number of Non-Detect Data			19
3285									Percent Non-Detects			100.00%
3286												

	A	B	C	D	E	F	G	H	I	J	K	L
3287	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
3288	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
3289	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
3290												
3291	**The data set for variable Hexavalent chromium (mw-43-75) was not processed!**											
3292												
3293												
3294												
3295	**Hexavalent chromium (mw-43-90)**											
3296												
3297	**General Statistics**											
3298						Number of Valid Data	19			Number of Detected Data	0	
3299						Number of Distinct Detected Data	0			Number of Non-Detect Data	19	
3300										Percent Non-Detects	100.00%	
3301												
3302	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
3303	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
3304	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
3305												
3306	**The data set for variable Hexavalent chromium (mw-43-90) was not processed!**											
3307												
3308												
3309												
3310	**Hexavalent chromium (mw-44-115)**											
3311												
3312	**General Statistics**											
3313						Number of Valid Observations	32			Number of Distinct Observations	28	
3314												
3315	**Raw Statistics**							**Log-transformed Statistics**				
3316						Minimum	0.62			Minimum of Log Data	-0.478	
3317						Maximum	1.71			Maximum of Log Data	0.536	
3318						Mean	1.255			Mean of log Data	0.195	
3319						Median	1.27			SD of log Data	0.265	
3320						SD	0.302					
3321						Coefficient of Variation	0.241					
3322						Skewness	-0.339					
3323												
3324	**Relevant UCL Statistics**											
3325	**Normal Distribution Test**							**Lognormal Distribution Test**				
3326						Shapiro Wilk Test Statistic	0.957			Shapiro Wilk Test Statistic	0.927	
3327						Shapiro Wilk Critical Value	0.93			Shapiro Wilk Critical Value	0.93	
3328	**Data appear Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**				
3329												
3330	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
3331						95% Student's-t UCL	1.346			95% H-UCL	1.37	
3332	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	1.518	
3333						95% Adjusted-CLT UCL	1.34			97.5% Chebyshev (MVUE) UCL	1.631	
3334						95% Modified-t UCL	1.345			99% Chebyshev (MVUE) UCL	1.853	
3335												
3336	**Gamma Distribution Test**							**Data Distribution**				
3337						k star (bias corrected)	14.43	**Data appear Normal at 5% Significance Level**				
3338						Theta Star	0.087					
3339						nu star	923.3					

3340				Approximate Chi Square Value (.05)	853.8		**Nonparametric Statistics**					
3341				Adjusted Level of Significance	0.0416					95% CLT UCL	1.343	
3342				Adjusted Chi Square Value	850.3					95% Jackknife UCL	1.346	
3343										95% Standard Bootstrap UCL	1.34	
3344				Anderson-Darling Test Statistic	0.558					95% Bootstrap-t UCL	1.342	
3345				Anderson-Darling 5% Critical Value	0.746					95% Hall's Bootstrap UCL	1.342	
3346				Kolmogorov-Smirnov Test Statistic	0.132					95% Percentile Bootstrap UCL	1.339	
3347				Kolmogorov-Smirnov 5% Critical Value	0.155					95% BCA Bootstrap UCL	1.34	
3348				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1.488	
3349										97.5% Chebyshev(Mean, Sd) UCL	1.589	
3350				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	1.787	
3351				95% Approximate Gamma UCL	1.357							
3352				95% Adjusted Gamma UCL	1.363							
3353												
3354				**Potential UCL to Use**						Use 95% Student's-t UCL	1.346	
3355												
3356												
3357	**Hexavalent chromium (mw-44-125)**											
3358												
3359					**General Statistics**							
3360				Number of Valid Observations	29					Number of Distinct Observations	27	
3361												
3362				**Raw Statistics**			**Log-transformed Statistics**					
3363				Minimum	0.157					Minimum of Log Data	-1.852	
3364				Maximum	0.634					Maximum of Log Data	-0.456	
3365				Mean	0.339					Mean of log Data	-1.139	
3366				Median	0.3					SD of log Data	0.335	
3367				SD	0.122							
3368				Coefficient of Variation	0.36							
3369				Skewness	1.118							
3370												
3371					**Relevant UCL Statistics**							
3372				**Normal Distribution Test**			**Lognormal Distribution Test**					
3373				Shapiro Wilk Test Statistic	0.886					Shapiro Wilk Test Statistic	0.96	
3374				Shapiro Wilk Critical Value	0.926					Shapiro Wilk Critical Value	0.926	
3375				**Data not Normal at 5% Significance Level**			**Data appear Lognormal at 5% Significance Level**					
3376												
3377				**Assuming Normal Distribution**			**Assuming Lognormal Distribution**					
3378				95% Student's-t UCL	0.377					95% H-UCL	0.38	
3379				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.431	
3380				95% Adjusted-CLT UCL	0.381					97.5% Chebyshev (MVUE) UCL	0.472	
3381				95% Modified-t UCL	0.378					99% Chebyshev (MVUE) UCL	0.551	
3382												
3383				**Gamma Distribution Test**			**Data Distribution**					
3384				k star (bias corrected)	8.139		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
3385				Theta Star	0.0416							
3386				nu star	472.1							
3387				Approximate Chi Square Value (.05)	422.7		**Nonparametric Statistics**					
3388				Adjusted Level of Significance	0.0407					95% CLT UCL	0.376	
3389				Adjusted Chi Square Value	419.9					95% Jackknife UCL	0.377	
3390										95% Standard Bootstrap UCL	0.375	
3391				Anderson-Darling Test Statistic	0.704					95% Bootstrap-t UCL	0.382	
3392				Anderson-Darling 5% Critical Value	0.746					95% Hall's Bootstrap UCL	0.382	

3393			Kolmogorov-Smirnov Test Statistic		0.178					95% Percentile Bootstrap UCL		0.376
3394			Kolmogorov-Smirnov 5% Critical Value		0.163					95% BCA Bootstrap UCL		0.38
3395			**Data follow Appr. Gamma Distribution at 5% Significance Level**							95% Chebyshev(Mean, Sd) UCL		0.437
3396										97.5% Chebyshev(Mean, Sd) UCL		0.48
3397			**Assuming Gamma Distribution**							99% Chebyshev(Mean, Sd) UCL		0.564
3398			95% Approximate Gamma UCL		0.378							
3399			95% Adjusted Gamma UCL		0.381							
3400												
3401			**Potential UCL to Use**							Use 95% Approximate Gamma UCL		0.378
3402												
3403												
3404	**Hexavalent chromium (mw-44-70)**											
3405												
3406					**General Statistics**							
3407			Number of Valid Data		12					Number of Detected Data		0
3408			Number of Distinct Detected Data		0					Number of Non-Detect Data		12
3409										Percent Non-Detects		100.00%
3410												
3411					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
3412					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
3413					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
3414												
3415					**The data set for variable Hexavalent chromium (mw-44-70) was not processed!**							
3416												
3417												
3418												
3419	**Hexavalent chromium (mw-45-095a)**											
3420												
3421					**General Statistics**							
3422			Number of Valid Observations		3					Number of Distinct Observations		3
3423												
3424												
3425					**Warning: This data set only has 3 observations!**							
3426					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
3427					**The data set for variable Hexavalent chromium (mw-45-095a) was not processed!**							
3428												
3429					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
3430					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
3431												
3432												
3433												
3434	**Hexavalent chromium (mw-46-175)**											
3435												
3436					**General Statistics**							
3437			Number of Valid Observations		29					Number of Distinct Observations		29
3438												
3439			**Raw Statistics**							**Log-transformed Statistics**		
3440			Minimum		0.0779					Minimum of Log Data		-2.552
3441			Maximum		0.287					Maximum of Log Data		-1.248
3442			Mean		0.159					Mean of log Data		-1.897
3443			Median		0.153					SD of log Data		0.358
3444			SD		0.0548							
3445			Coefficient of Variation		0.344							

Skewness	0.321	

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.95	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.926	Shapiro Wilk Critical Value	0.926
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.176	95% H-UCL	0.181
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.207
95% Adjusted-CLT UCL	0.177	97.5% Chebyshev (MVUE) UCL	0.227
95% Modified-t UCL	0.177	99% Chebyshev (MVUE) UCL	0.267

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	7.665	**Data appear Normal at 5% Significance Level**	
Theta Star	0.0208		
nu star	444.5		
Approximate Chi Square Value (.05)	396.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0407	95% CLT UCL	0.176
Adjusted Chi Square Value	394	95% Jackknife UCL	0.176
		95% Standard Bootstrap UCL	0.176
Anderson-Darling Test Statistic	0.485	95% Bootstrap-t UCL	0.177
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.176
Kolmogorov-Smirnov Test Statistic	0.116	95% Percentile Bootstrap UCL	0.175
Kolmogorov-Smirnov 5% Critical Value	0.163	95% BCA Bootstrap UCL	0.176
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.204
		97.5% Chebyshev(Mean, Sd) UCL	0.223
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.26
95% Approximate Gamma UCL	0.178		
95% Adjusted Gamma UCL	0.18		
Potential UCL to Use		Use 95% Student's-t UCL	0.176

Hexavalent chromium (mw-46-205)

General Statistics

Number of Valid Data	14	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	7
		Percent Non-Detects	50.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.002	Minimum Detected	-6.215
Maximum Detected	0.00452	Maximum Detected	-5.399
Mean of Detected	0.00335	Mean of Detected	-5.742
SD of Detected	0.0009681	SD of Detected	0.323
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908

Warning: There are only 7 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

	A	B	C	D	E	F	G	H	I	J	K	L
3499	the resulting calculations may not be reliable enough tp draw conclusions											
3500												
3501	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
3502												
3503												
3504	UCL Statistics											
3505	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
3506					Shapiro Wilk Test Statistic	0.896					Shapiro Wilk Test Statistic	0.852
3507					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
3508	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
3509												
3510	Assuming Normal Distribution						Assuming Lognormal Distribution					
3511					DL/2 Substitution Method						DL/2 Substitution Method	
3512					Mean	0.00192					Mean	-6.671
3513					SD	0.00162					SD	0.989
3514					95% DL/2 (t) UCL	0.00269					95% H-Stat (DL/2) UCL	0.00442
3515												
3516					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
3517					Mean	0.00336					Mean in Log Scale	-6.185
3518					SD	0.0008963					SD in Log Scale	0.546
3519					95% MLE (t) UCL	0.00378					Mean in Original Scale	0.00236
3520					95% MLE (Tiku) UCL	0.00395					SD in Original Scale	0.00124
3521											95% Percentile Bootstrap UCL	0.0029
3522											95% BCA Bootstrap UCL	0.00294
3523												
3524	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
3525					k star (bias corrected)	7.052	Data appear Normal at 5% Significance Level					
3526					Theta Star	0.0004744						
3527					nu star	98.73						
3528												
3529					A-D Test Statistic	0.537	Nonparametric Statistics					
3530					5% A-D Critical Value	0.708					Kaplan-Meier (KM) Method	
3531					K-S Test Statistic	0.708					Mean	0.00267
3532					5% K-S Critical Value	0.312					SD	0.0009244
3533	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.0002668
3534											95% KM (t) UCL	0.00315
3535	Assuming Gamma Distribution										95% KM (z) UCL	0.00311
3536					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0031
3537					Minimum	0.00178					95% KM (bootstrap t) UCL	0.00315
3538					Maximum	0.00452					95% KM (BCA) UCL	0.00377
3539					Mean	0.00335					95% KM (Percentile Bootstrap) UCL	0.00355
3540					Median	0.00361					95% KM (Chebyshev) UCL	0.00384
3541					SD	0.0009157					97.5% KM (Chebyshev) UCL	0.00434
3542					k star	9.8					99% KM (Chebyshev) UCL	0.00533
3543					Theta star	0.0003414						
3544					Nu star	274.4	Potential UCLs to Use					
3545					AppChi2	237					95% KM (t) UCL	0.00315
3546					95% Gamma Approximate UCL	0.00387					95% KM (Percentile Bootstrap) UCL	0.00355
3547					95% Adjusted Gamma UCL	0.00395						
3548	Note: DL/2 is not a recommended method.											
3549												
3550												
3551	Hexavalent chromium (mw-47-115)											

3552												
3553	**General Statistics**											
3554					Number of Valid Data	8				Number of Detected Data		6
3555					Number of Distinct Detected Data	6				Number of Non-Detect Data		2
3556										Percent Non-Detects		25.00%
3557												
3558	**Raw Statistics**							**Log-transformed Statistics**				
3559					Minimum Detected	0.0014				Minimum Detected		-6.571
3560					Maximum Detected	0.0182				Maximum Detected		-4.006
3561					Mean of Detected	0.0106				Mean of Detected		-4.781
3562					SD of Detected	0.00571				SD of Detected		0.921
3563					Minimum Non-Detect	0.002				Minimum Non-Detect		-6.215
3564					Maximum Non-Detect	0.0035				Maximum Non-Detect		-5.655
3565												
3566	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		3
3567	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		5
3568	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		37.50%
3569												
3570	**Warning: There are only 6 Detected Values in this data**											
3571	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3572	**the resulting calculations may not be reliable enough tp draw conclusions**											
3573												
3574	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3575												
3576												
3577	**UCL Statistics**											
3578	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
3579					Shapiro Wilk Test Statistic	0.979				Shapiro Wilk Test Statistic		0.781
3580					5% Shapiro Wilk Critical Value	0.788				5% Shapiro Wilk Critical Value		0.788
3581	**Data appear Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**				
3582												
3583	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
3584					DL/2 Substitution Method					DL/2 Substitution Method		
3585					Mean	0.00832				Mean		-5.242
3586					SD	0.00646				SD		1.166
3587					95% DL/2 (t) UCL	0.0126				95% H-Stat (DL/2) UCL		0.0637
3588												
3589					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
3590					Mean	0.0125				Mean in Log Scale		-5.126
3591					SD	0.00348				SD in Log Scale		1.007
3592					95% MLE (t) UCL	0.0148				Mean in Original Scale		0.0085
3593					95% MLE (Tiku) UCL	0.0155				SD in Original Scale		0.00623
3594										95% Percentile Bootstrap UCL		0.012
3595										95% BCA Bootstrap UCL		0.0121
3596												
3597	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
3598					k star (bias corrected)	1.243		**Data appear Normal at 5% Significance Level**				
3599					Theta Star	0.00856						
3600					nu star	14.91						
3601												
3602					A-D Test Statistic	0.511		**Nonparametric Statistics**				
3603					5% A-D Critical Value	0.703		Kaplan-Meier (KM) Method				
3604					K-S Test Statistic	0.703				Mean		0.00833

3605				5% K-S Critical Value	0.335					SD	0.00603
3606	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00234
3607										95% KM (t) UCL	0.0127
3608	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0122
3609	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL	0.013
3610				Minimum	0.0014					95% KM (bootstrap t) UCL	0.0123
3611				Maximum	0.0182					95% KM (BCA) UCL	0.0139
3612				Mean	0.00958					95% KM (Percentile Bootstrap) UCL	0.0129
3613				Median	0.00925					95% KM (Chebyshev) UCL	0.0185
3614				SD	0.0052					97.5% KM (Chebyshev) UCL	0.0229
3615				k star	1.748					99% KM (Chebyshev) UCL	0.0316
3616				Theta star	0.00548						
3617				Nu star	27.97					**Potential UCLs to Use**	
3618				AppChi2	16.9					95% KM (t) UCL	0.0127
3619				95% Gamma Approximate UCL	0.0159					95% KM (Percentile Bootstrap) UCL	0.0129
3620				95% Adjusted Gamma UCL	0.0181						
3621	**Note: DL/2 is not a recommended method.**										
3622											
3623											
3624	**Hexavalent chromium (mw-47-55)**										
3625											
3626	**General Statistics**										
3627				Number of Valid Observations	8					Number of Distinct Observations	8
3628											
3629	**Raw Statistics**									**Log-transformed Statistics**	
3630				Minimum	0.0109					Minimum of Log Data	-4.519
3631				Maximum	0.0619					Maximum of Log Data	-2.782
3632				Mean	0.0418					Mean of log Data	-3.307
3633				Median	0.0447					SD of log Data	0.607
3634				SD	0.0194						
3635				Coefficient of Variation	0.463						
3636				Skewness	-0.426						
3637											
3638											
3639	**Warning: There are only 8 Values in this data**										
3640	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**										
3641	**the resulting calculations may not be reliable enough to draw conclusions**										
3642											
3643	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**										
3644											
3645	**Relevant UCL Statistics**										
3646	**Normal Distribution Test**									**Lognormal Distribution Test**	
3647				Shapiro Wilk Test Statistic	0.892					Shapiro Wilk Test Statistic	0.852
3648				Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
3649	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**	
3650											
3651	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
3652				95% Student's-t UCL	0.0548					95% H-UCL	0.079
3653	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.0836
3654				95% Adjusted-CLT UCL	0.052					97.5% Chebyshev (MVUE) UCL	0.101
3655				95% Modified-t UCL	0.0546					99% Chebyshev (MVUE) UCL	0.136
3656											
3657	**Gamma Distribution Test**									**Data Distribution**	

3658					k star (bias corrected)	2.543		**Data appear Normal at 5% Significance Level**				
3659					Theta Star	0.0165						
3660					nu star	40.68						
3661					Approximate Chi Square Value (.05)	27.06		**Nonparametric Statistics**				
3662					Adjusted Level of Significance	0.0195					95% CLT UCL	0.0531
3663					Adjusted Chi Square Value	24.29					95% Jackknife UCL	0.0548
3664											95% Standard Bootstrap UCL	0.0524
3665					Anderson-Darling Test Statistic	0.488					95% Bootstrap-t UCL	0.0532
3666					Anderson-Darling 5% Critical Value	0.719					95% Hall's Bootstrap UCL	0.0507
3667					Kolmogorov-Smirnov Test Statistic	0.264					95% Percentile Bootstrap UCL	0.0521
3668					Kolmogorov-Smirnov 5% Critical Value	0.295					95% BCA Bootstrap UCL	0.0514
3669					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0717
3670											97.5% Chebyshev(Mean, Sd) UCL	0.0846
3671					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.11
3672					95% Approximate Gamma UCL	0.0629						
3673					95% Adjusted Gamma UCL	0.07						
3674												
3675					**Potential UCL to Use**						Use 95% Student's-t UCL	0.0548
3676												
3677												
3678	**Hexavalent chromium (mw-48)**											
3679												
3680					**General Statistics**							
3681					Number of Valid Data	8		Number of Detected Data	0			
3682					Number of Distinct Detected Data	0		Number of Non-Detect Data	8			
3683								Percent Non-Detects	100.00%			
3684												
3685					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
3686					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
3687					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
3688												
3689					**The data set for variable Hexavalent chromium (mw-48) was not processed!**							
3690												
3691												
3692												
3693	**Hexavalent chromium (mw-49-135)**											
3694												
3695					**General Statistics**							
3696					Number of Valid Data	7		Number of Detected Data	0			
3697					Number of Distinct Detected Data	0		Number of Non-Detect Data	7			
3698								Percent Non-Detects	100.00%			
3699												
3700					**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**							
3701					**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**							
3702					**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**							
3703												
3704					**The data set for variable Hexavalent chromium (mw-49-135) was not processed!**							
3705												
3706												
3707												
3708	**Hexavalent chromium (mw-49-275)**											
3709												
3710					**General Statistics**							

Number of Valid Data	7	Number of Detected Data 0
Number of Distinct Detected Data	0	Number of Non-Detect Data 7
		Percent Non-Detects 100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Hexavalent chromium (mw-49-275) was not processed!

Hexavalent chromium (mw-49-365)

General Statistics

Number of Valid Data	7	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	7
		Percent Non-Detects	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Hexavalent chromium (mw-49-365) was not processed!

Hexavalent chromium (mw-5)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	5

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.01	Minimum of Log Data	-4.605
Maximum	0.02	Maximum of Log Data	-3.912
Mean	0.013	Mean of log Data	-4.37
Median	0.0125	SD of log Data	0.254
SD	0.00368		
Coefficient of Variation	0.283		
Skewness	1.718		

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

3764												
3765	**Relevant UCL Statistics**											
3766	**Normal Distribution Test**						**Lognormal Distribution Test**					
3767					Shapiro Wilk Test Statistic	0.799					Shapiro Wilk Test Statistic	0.856
3768					Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788
3769	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3770												
3771	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3772					95% Student's-t UCL	0.016					95% H-UCL	0.0167
3773	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0189
3774					95% Adjusted-CLT UCL	0.0166					97.5% Chebyshev (MVUE) UCL	0.0214
3775					95% Modified-t UCL	0.0162					99% Chebyshev (MVUE) UCL	0.0264
3776												
3777	**Gamma Distribution Test**						**Data Distribution**					
3778					k star (bias corrected)	8.866	**Data appear Normal at 5% Significance Level**					
3779					Theta Star	0.00147						
3780					nu star	106.4						
3781					Approximate Chi Square Value (.05)	83.59	**Nonparametric Statistics**					
3782					Adjusted Level of Significance	0.0122					95% CLT UCL	0.0155
3783					Adjusted Chi Square Value	76.3					95% Jackknife UCL	0.016
3784											95% Standard Bootstrap UCL	0.0153
3785					Anderson-Darling Test Statistic	0.53					95% Bootstrap-t UCL	0.0181
3786					Anderson-Darling 5% Critical Value	0.697					95% Hall's Bootstrap UCL	0.0264
3787					Kolmogorov-Smirnov Test Statistic	0.278					95% Percentile Bootstrap UCL	0.0154
3788					Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	0.0162
3789	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.0196
3790											97.5% Chebyshev(Mean, Sd) UCL	0.0224
3791	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.028
3792					95% Approximate Gamma UCL	0.0166						
3793					95% Adjusted Gamma UCL	0.0181						
3794												
3795	**Potential UCL to Use**										Use 95% Student's-t UCL	0.016
3796												
3797												
3798	**Hexavalent chromium (mw-50-095)**											
3799												
3800	**General Statistics**											
3801					Number of Valid Observations	8					Number of Distinct Observations	8
3802												
3803	**Raw Statistics**						**Log-transformed Statistics**					
3804					Minimum	0.164					Minimum of Log Data	-1.808
3805					Maximum	0.304					Maximum of Log Data	-1.191
3806					Mean	0.241					Mean of log Data	-1.442
3807					Median	0.246					SD of log Data	0.21
3808					SD	0.0482						
3809					Coefficient of Variation	0.2						
3810					Skewness	-0.308						
3811												
3812												
3813	**Warning: There are only 8 Values in this data**											
3814	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
3815	**the resulting calculations may not be reliable enough to draw conclusions**											
3816												

3817	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
3818												
3819	**Relevant UCL Statistics**											
3820	**Normal Distribution Test**						**Lognormal Distribution Test**					
3821				Shapiro Wilk Test Statistic	0.927					Shapiro Wilk Test Statistic	0.917	
3822				Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818	
3823	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3824												
3825	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3826				95% Student's-t UCL	0.273					95% H-UCL	0.282	
3827	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.319	
3828				95% Adjusted-CLT UCL	0.267					97.5% Chebyshev (MVUE) UCL	0.353	
3829				95% Modified-t UCL	0.273					99% Chebyshev (MVUE) UCL	0.42	
3830												
3831	**Gamma Distribution Test**						**Data Distribution**					
3832				k star (bias corrected)	16.92		**Data appear Normal at 5% Significance Level**					
3833				Theta Star	0.0142							
3834				nu star	270.7							
3835				Approximate Chi Square Value (.05)	233.6		**Nonparametric Statistics**					
3836				Adjusted Level of Significance	0.0195					95% CLT UCL	0.269	
3837				Adjusted Chi Square Value	224.9					95% Jackknife UCL	0.273	
3838										95% Standard Bootstrap UCL	0.266	
3839				Anderson-Darling Test Statistic	0.415					95% Bootstrap-t UCL	0.269	
3840				Anderson-Darling 5% Critical Value	0.716					95% Hall's Bootstrap UCL	0.264	
3841				Kolmogorov-Smirnov Test Statistic	0.266					95% Percentile Bootstrap UCL	0.268	
3842				Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	0.268	
3843	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.315	
3844										97.5% Chebyshev(Mean, Sd) UCL	0.347	
3845	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.41	
3846				95% Approximate Gamma UCL	0.279							
3847				95% Adjusted Gamma UCL	0.29							
3848												
3849	**Potential UCL to Use**									Use 95% Student's-t UCL	0.273	
3850												
3851												
3852	**Hexavalent chromium (mw-50-200)**											
3853												
3854	**General Statistics**											
3855				Number of Valid Observations	8					Number of Distinct Observations	8	
3856												
3857	**Raw Statistics**						**Log-transformed Statistics**					
3858				Minimum	5.81					Minimum of Log Data	1.76	
3859				Maximum	12.3					Maximum of Log Data	2.51	
3860				Mean	9.556					Mean of log Data	2.235	
3861				Median	9.88					SD of log Data	0.233	
3862				SD	1.994							
3863				Coefficient of Variation	0.209							
3864				Skewness	-0.826							
3865												
3866												
3867	**Warning: There are only 8 Values in this data**											
3868	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
3869	**the resulting calculations may not be reliable enough to draw conclusions**											

3870												
3871	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
3872												
3873	**Relevant UCL Statistics**											
3874	**Normal Distribution Test**						**Lognormal Distribution Test**					
3875				Shapiro Wilk Test Statistic	0.947					Shapiro Wilk Test Statistic	0.893	
3876				Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818	
3877	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3878												
3879	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3880				95% Student's-t UCL	10.89					95% H-UCL	11.44	
3881	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	13.02	
3882				95% Adjusted-CLT UCL	10.5					97.5% Chebyshev (MVUE) UCL	14.52	
3883				95% Modified-t UCL	10.86					99% Chebyshev (MVUE) UCL	17.45	
3884												
3885	**Gamma Distribution Test**						**Data Distribution**					
3886				k star (bias corrected)	14.38		**Data appear Normal at 5% Significance Level**					
3887				Theta Star	0.665							
3888				nu star	230.1							
3889				Approximate Chi Square Value (.05)	196		**Nonparametric Statistics**					
3890				Adjusted Level of Significance	0.0195					95% CLT UCL	10.72	
3891				Adjusted Chi Square Value	188					95% Jackknife UCL	10.89	
3892										95% Standard Bootstrap UCL	10.66	
3893				Anderson-Darling Test Statistic	0.411					95% Bootstrap-t UCL	10.67	
3894				Anderson-Darling 5% Critical Value	0.716					95% Hall's Bootstrap UCL	10.53	
3895				Kolmogorov-Smirnov Test Statistic	0.253					95% Percentile Bootstrap UCL	10.61	
3896				Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	10.48	
3897	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	12.63	
3898										97.5% Chebyshev(Mean, Sd) UCL	13.96	
3899	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	16.57	
3900				95% Approximate Gamma UCL	11.22							
3901				95% Adjusted Gamma UCL	11.7							
3902												
3903	**Potential UCL to Use**									Use 95% Student's-t UCL	10.89	
3904												
3905												
3906	**Hexavalent chromium (mw-51)**											
3907												
3908	**General Statistics**											
3909				Number of Valid Observations	7					Number of Distinct Observations	7	
3910												
3911	**Raw Statistics**						**Log-transformed Statistics**					
3912				Minimum	4.13					Minimum of Log Data	1.418	
3913				Maximum	4.69					Maximum of Log Data	1.545	
3914				Mean	4.506					Mean of log Data	1.504	
3915				Median	4.56					SD of log Data	0.045	
3916				SD	0.199							
3917				Coefficient of Variation	0.0441							
3918				Skewness	-1.287							
3919												
3920												
3921	**Warning: A sample size of 'n' = 7 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
3922												

3923	It is suggested to collect at least 8 to 10 observations using these statistical methods!											
3924	If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3925												
3926												
3927	Warning: There are only 7 Values in this data											
3928	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
3929	the resulting calculations may not be reliable enough to draw conclusions											
3930												
3931	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
3932												
3933	Relevant UCL Statistics											
3934	Normal Distribution Test						Lognormal Distribution Test					
3935				Shapiro Wilk Test Statistic	0.882					Shapiro Wilk Test Statistic	0.873	
3936				Shapiro Wilk Critical Value	0.803					Shapiro Wilk Critical Value	0.803	
3937	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
3938												
3939	Assuming Normal Distribution						Assuming Lognormal Distribution					
3940				95% Student's-t UCL	4.652					95% H-UCL	N/A	
3941	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL	4.84	
3942				95% Adjusted-CLT UCL	4.59					97.5% Chebyshev (MVUE) UCL	4.985	
3943				95% Modified-t UCL	4.645					99% Chebyshev (MVUE) UCL	5.269	
3944												
3945	Gamma Distribution Test						Data Distribution					
3946				k star (bias corrected)	333.6		Data appear Normal at 5% Significance Level					
3947				Theta Star	0.0135							
3948				nu star	4671							
3949				Approximate Chi Square Value (.05)	4513		Nonparametric Statistics					
3950				Adjusted Level of Significance	0.0158					95% CLT UCL	4.629	
3951				Adjusted Chi Square Value	4465					95% Jackknife UCL	4.652	
3952										95% Standard Bootstrap UCL	4.619	
3953				Anderson-Darling Test Statistic	0.437					95% Bootstrap-t UCL	4.615	
3954				Anderson-Darling 5% Critical Value	0.708					95% Hall's Bootstrap UCL	4.597	
3955				Kolmogorov-Smirnov Test Statistic	0.208					95% Percentile Bootstrap UCL	4.604	
3956				Kolmogorov-Smirnov 5% Critical Value	0.311					95% BCA Bootstrap UCL	4.594	
3957	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL	4.833	
3958										97.5% Chebyshev(Mean, Sd) UCL	4.974	
3959	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL	5.252	
3960				95% Approximate Gamma UCL	4.663							
3961				95% Adjusted Gamma UCL	4.713							
3962												
3963	Potential UCL to Use									Use 95% Student's-t UCL	4.652	
3964												
3965												
3966	Hexavalent chromium (mw-52d)											
3967												
3968	General Statistics											
3969				Number of Valid Data	8					Number of Detected Data	0	
3970				Number of Distinct Detected Data	0					Number of Non-Detect Data	8	
3971										Percent Non-Detects	100.00%	
3972												
3973	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
3974	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
3975	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											

	A	B	C	D	E	F	G	H	I	J	K	L
3976												
3977	The data set for variable Hexavalent chromium (mw-52d) was not processed!											
3978												
3979												
3980												
3981	Hexavalent chromium (mw-52m)											
3982												
3983	General Statistics											
3984					Number of Valid Data	8			Number of Detected Data	0		
3985					Number of Distinct Detected Data	0			Number of Non-Detect Data	8		
3986									Percent Non-Detects	100.00%		
3987												
3988	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
3989	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
3990	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
3991												
3992	The data set for variable Hexavalent chromium (mw-52m) was not processed!											
3993												
3994												
3995												
3996	Hexavalent chromium (mw-52s)											
3997												
3998	General Statistics											
3999					Number of Valid Data	8			Number of Detected Data	0		
4000					Number of Distinct Detected Data	0			Number of Non-Detect Data	8		
4001									Percent Non-Detects	100.00%		
4002												
4003	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
4004	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
4005	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
4006												
4007	The data set for variable Hexavalent chromium (mw-52s) was not processed!											
4008												
4009												
4010												
4011	Hexavalent chromium (mw-53d)											
4012												
4013	General Statistics											
4014					Number of Valid Data	8			Number of Detected Data	0		
4015					Number of Distinct Detected Data	0			Number of Non-Detect Data	8		
4016									Percent Non-Detects	100.00%		
4017												
4018	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
4019	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
4020	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
4021												
4022	The data set for variable Hexavalent chromium (mw-53d) was not processed!											
4023												
4024												
4025												
4026	Hexavalent chromium (mw-53m)											
4027												
4028	General Statistics											

4029				Number of Valid Data	8					Number of Detected Data	0	
4030				Number of Distinct Detected Data	0					Number of Non-Detect Data	8	
4031										Percent Non-Detects	100.00%	
4032												
4033	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
4034	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
4035	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
4036												
4037	The data set for variable Hexavalent chromium (mw-53m) was not processed!											
4038												
4039												
4040												
4041	Hexavalent chromium (mw-54-140)											
4042												
4043	General Statistics											
4044				Number of Valid Data	3					Number of Detected Data	0	
4045				Number of Distinct Detected Data	0					Number of Non-Detect Data	3	
4046										Percent Non-Detects	100.00%	
4047												
4048	Warning: This data set only has 3 observations!											
4049	Data set is too small to compute reliable and meaningful statistics and estimates!											
4050	The data set for variable Hexavalent chromium (mw-54-140) was not processed!											
4051												
4052	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4053	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4054												
4055												
4056												
4057	Hexavalent chromium (mw-54-195)											
4058												
4059	General Statistics											
4060				Number of Valid Data	3					Number of Detected Data	0	
4061				Number of Distinct Detected Data	0					Number of Non-Detect Data	3	
4062										Percent Non-Detects	100.00%	
4063												
4064	Warning: This data set only has 3 observations!											
4065	Data set is too small to compute reliable and meaningful statistics and estimates!											
4066	The data set for variable Hexavalent chromium (mw-54-195) was not processed!											
4067												
4068	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4069	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4070												
4071												
4072												
4073	Hexavalent chromium (mw-54-85)											
4074												
4075	General Statistics											
4076				Number of Valid Data	3					Number of Detected Data	0	
4077				Number of Distinct Detected Data	0					Number of Non-Detect Data	3	
4078										Percent Non-Detects	100.00%	
4079												
4080	Warning: This data set only has 3 observations!											
4081	Data set is too small to compute reliable and meaningful statistics and estimates!											

	A	B	C	D	E	F	G	H	I	J	K	L
4082	The data set for variable Hexavalent chromium (mw-54-85) was not processed!											
4083												
4084	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4085	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4086												
4087												
4088												
4089	Hexavalent chromium (mw-55-120)											
4090												
4091	General Statistics											
4092					Number of Valid Data	3			Number of Detected Data	0		
4093					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
4094									Percent Non-Detects	100.00%		
4095												
4096	Warning: This data set only has 3 observations!											
4097	Data set is too small to compute reliable and meaningful statistics and estimates!											
4098	The data set for variable Hexavalent chromium (mw-55-120) was not processed!											
4099												
4100	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4101	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4102												
4103												
4104												
4105	Hexavalent chromium (mw-55-45)											
4106												
4107	General Statistics											
4108					Number of Valid Data	3			Number of Detected Data	0		
4109					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
4110									Percent Non-Detects	100.00%		
4111												
4112	Warning: This data set only has 3 observations!											
4113	Data set is too small to compute reliable and meaningful statistics and estimates!											
4114	The data set for variable Hexavalent chromium (mw-55-45) was not processed!											
4115												
4116	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4117	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4118												
4119												
4120												
4121	Hexavalent chromium (mw-56d)											
4122												
4123	General Statistics											
4124					Number of Valid Data	3			Number of Detected Data	0		
4125					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
4126									Percent Non-Detects	100.00%		
4127												
4128	Warning: This data set only has 3 observations!											
4129	Data set is too small to compute reliable and meaningful statistics and estimates!											
4130	The data set for variable Hexavalent chromium (mw-56d) was not processed!											
4131												
4132	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4133	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4134												

	A	B	C	D	E	F	G	H	I	J	K	L
4135												
4136												
4137	**Hexavalent chromium (mw-56m)**											
4138												
4139						**General Statistics**						
4140					Number of Valid Data	3			Number of Detected Data			0
4141					Number of Distinct Detected Data	0			Number of Non-Detect Data			3
4142									Percent Non-Detects			100.00%
4143												
4144						**Warning: This data set only has 3 observations!**						
4145						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
4146						**The data set for variable Hexavalent chromium (mw-56m) was not processed!**						
4147												
4148						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
4149						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
4150												
4151												
4152												
4153	**Hexavalent chromium (mw-56s)**											
4154												
4155						**General Statistics**						
4156					Number of Valid Data	3			Number of Detected Data			0
4157					Number of Distinct Detected Data	0			Number of Non-Detect Data			3
4158									Percent Non-Detects			100.00%
4159												
4160						**Warning: This data set only has 3 observations!**						
4161						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
4162						**The data set for variable Hexavalent chromium (mw-56s) was not processed!**						
4163												
4164						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
4165						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
4166												
4167												
4168												
4169	**Hexavalent chromium (mw-6)**											
4170												
4171						**General Statistics**						
4172					Number of Valid Observations	6			Number of Distinct Observations			4
4173												
4174					**Raw Statistics**				**Log-transformed Statistics**			
4175					Minimum	0.007			Minimum of Log Data			-4.962
4176					Maximum	0.01			Maximum of Log Data			-4.605
4177					Mean	0.00887			Mean of log Data			-4.737
4178					Median	0.0095			SD of log Data			0.169
4179					SD	0.00142						
4180					Coefficient of Variation	0.161						
4181					Skewness	-0.703						
4182												
4183												
4184						**Warning: There are only 4 Distinct Values in this data**						
4185						**There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.**						
4186						**Those methods will return a 'N/A' value on your output display!**						
4187												

4188	It is necessary to have 4 or more Distinct Values to compute bootstrap methods.											
4189	It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.											
4190												
4191												
4192	Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!											
4193												
4194	It is suggested to collect at least 8 to 10 observations using these statistical methods!											
4195	If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4196												
4197	Relevant UCL Statistics											
4198	Normal Distribution Test						Lognormal Distribution Test					
4199					Shapiro Wilk Test Statistic	0.775					Shapiro Wilk Test Statistic	0.77
4200					Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788
4201	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
4202												
4203	Assuming Normal Distribution						Assuming Lognormal Distribution					
4204					95% Student's-t UCL	0.01					95% H-UCL	0.0104
4205	95% UCLs (Adjusted for Skewness)										95% Chebyshev (MVUE) UCL	0.0115
4206					95% Adjusted-CLT UCL	0.00964					97.5% Chebyshev (MVUE) UCL	0.0127
4207					95% Modified-t UCL	0.01					99% Chebyshev (MVUE) UCL	0.0149
4208												
4209	Gamma Distribution Test						Data Distribution					
4210					k star (bias corrected)	21.99	Data Follow Appr. Gamma Distribution at 5% Significance Level					
4211					Theta Star	0.0004032						
4212					nu star	263.9						
4213					Approximate Chi Square Value (.05)	227.3	Nonparametric Statistics					
4214					Adjusted Level of Significance	0.0122					95% CLT UCL	0.00982
4215					Adjusted Chi Square Value	214.9					95% Jackknife UCL	0.01
4216											95% Standard Bootstrap UCL	0.00972
4217					Anderson-Darling Test Statistic	0.753					95% Bootstrap-t UCL	0.00994
4218					Anderson-Darling 5% Critical Value	0.697					95% Hall's Bootstrap UCL	0.00946
4219					Kolmogorov-Smirnov Test Statistic	0.306					95% Percentile Bootstrap UCL	0.00967
4220					Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	0.0095
4221	Data follow Appr. Gamma Distribution at 5% Significance Level										95% Chebyshev(Mean, Sd) UCL	0.0114
4222											97.5% Chebyshev(Mean, Sd) UCL	0.0125
4223	Assuming Gamma Distribution										99% Chebyshev(Mean, Sd) UCL	0.0146
4224					95% Approximate Gamma UCL	0.0103						
4225					95% Adjusted Gamma UCL	0.0109						
4226												
4227	Potential UCL to Use										Use 95% Approximate Gamma UCL	0.0103
4228	Recommended UCL exceeds the maximum observation											
4229												
4230												
4231	Hexavalent chromium (mw-7)											
4232												
4233	General Statistics											
4234					Number of Valid Observations	6					Number of Distinct Observations	5
4235												
4236	Raw Statistics						Log-transformed Statistics					
4237					Minimum	0.01					Minimum of Log Data	-4.605
4238					Maximum	0.02					Maximum of Log Data	-3.912
4239					Mean	0.0142					Mean of log Data	-4.285
4240					Median	0.0147					SD of log Data	0.273

SD	0.0038	
Coefficient of Variation	0.268	
Skewness	0.284	

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Test Statistic	0.892
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0173	95% H-UCL	0.0187
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0211
95% Adjusted-CLT UCL	0.0169	97.5% Chebyshev (MVUE) UCL	0.0241
95% Modified-t UCL	0.0174	99% Chebyshev (MVUE) UCL	0.0299
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	8.374	**Data appear Normal at 5% Significance Level**	
Theta Star	0.0017		
nu star	100.5		
Approximate Chi Square Value (.05)	78.36	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	0.0168
Adjusted Chi Square Value	71.33	95% Jackknife UCL	0.0173
		95% Standard Bootstrap UCL	0.0165
Anderson-Darling Test Statistic	0.413	95% Bootstrap-t UCL	0.0171
Anderson-Darling 5% Critical Value	0.698	95% Hall's Bootstrap UCL	0.0167
Kolmogorov-Smirnov Test Statistic	0.244	95% Percentile Bootstrap UCL	0.0168
Kolmogorov-Smirnov 5% Critical Value	0.332	95% BCA Bootstrap UCL	0.0168
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.021
		97.5% Chebyshev(Mean, Sd) UCL	0.0239
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0296
95% Approximate Gamma UCL	0.0182		
95% Adjusted Gamma UCL	0.02		
Potential UCL to Use		Use 95% Student's-t UCL	0.0173

Hexavalent chromium (mw-8)

General Statistics

4294	Number of Valid Observations				6		Number of Distinct Observations					6
4295												
4296	**Raw Statistics**						**Log-transformed Statistics**					
4297	Minimum				0.02		Minimum of Log Data					-3.912
4298	Maximum				0.0509		Maximum of Log Data					-2.978
4299	Mean				0.0427		Mean of log Data					-3.198
4300	Median				0.0465		SD of log Data					0.354
4301	SD				0.0114							
4302	Coefficient of Variation				0.268							
4303	Skewness				-2.154							
4304												
4305												
4306	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
4307												
4308	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
4309	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4310												
4311												
4312	**Warning: There are only 6 Values in this data**											
4313	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
4314	**the resulting calculations may not be reliable enough to draw conclusions**											
4315												
4316	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
4317												
4318	**Relevant UCL Statistics**											
4319	**Normal Distribution Test**						**Lognormal Distribution Test**					
4320	Shapiro Wilk Test Statistic				0.719		Shapiro Wilk Test Statistic					0.651
4321	Shapiro Wilk Critical Value				0.788		Shapiro Wilk Critical Value					0.788
4322	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
4323												
4324	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
4325	95% Student's-t UCL				0.052		95% H-UCL					0.0629
4326	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0701
4327	95% Adjusted-CLT UCL				0.0459		97.5% Chebyshev (MVUE) UCL					0.0819
4328	95% Modified-t UCL				0.0514		99% Chebyshev (MVUE) UCL					0.105
4329												
4330	**Gamma Distribution Test**						**Data Distribution**					
4331	k star (bias corrected)				5.946		**Data do not follow a Discernable Distribution (0.05)**					
4332	Theta Star				0.00717							
4333	nu star				71.35							
4334	Approximate Chi Square Value (.05)				52.9		**Nonparametric Statistics**					
4335	Adjusted Level of Significance				0.0122		95% CLT UCL					0.0503
4336	Adjusted Chi Square Value				47.21		95% Jackknife UCL					0.052
4337							95% Standard Bootstrap UCL					0.0496
4338	Anderson-Darling Test Statistic				1.05		95% Bootstrap-t UCL					0.049
4339	Anderson-Darling 5% Critical Value				0.698		95% Hall's Bootstrap UCL					0.0471
4340	Kolmogorov-Smirnov Test Statistic				0.383		95% Percentile Bootstrap UCL					0.0485
4341	Kolmogorov-Smirnov 5% Critical Value				0.332		95% BCA Bootstrap UCL					0.0476
4342	**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.063
4343							97.5% Chebyshev(Mean, Sd) UCL					0.0718
4344	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.089
4345	95% Approximate Gamma UCL				0.0575							
4346	95% Adjusted Gamma UCL				0.0645							

4347												
4348	**Potential UCL to Use**									Use 95% Student's-t UCL		0.052
4349										or 95% Modified-t UCL		0.0514
4350	**Recommended UCL exceeds the maximum observation**											
4351												
4352												
4353	**Hexavalent chromium (mw-9)**											
4354												
4355	**General Statistics**											
4356	Number of Valid Observations				35		Number of Distinct Observations					30
4357												
4358	**Raw Statistics**						**Log-transformed Statistics**					
4359	Minimum				0.265		Minimum of Log Data					-1.328
4360	Maximum				0.402		Maximum of Log Data					-0.911
4361	Mean				0.339		Mean of log Data					-1.084
4362	Median				0.343		SD of log Data					0.0872
4363	SD				0.0285							
4364	Coefficient of Variation				0.0839							
4365	Skewness				-0.741							
4366												
4367	**Relevant UCL Statistics**											
4368	**Normal Distribution Test**						**Lognormal Distribution Test**					
4369	Shapiro Wilk Test Statistic				0.939		Shapiro Wilk Test Statistic					0.917
4370	Shapiro Wilk Critical Value				0.934		Shapiro Wilk Critical Value					0.934
4371	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
4372												
4373	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
4374	95% Student's-t UCL				0.348		95% H-UCL					N/A
4375	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.361
4376	95% Adjusted-CLT UCL				0.347		97.5% Chebyshev (MVUE) UCL					0.371
4377	95% Modified-t UCL				0.347		99% Chebyshev (MVUE) UCL					0.389
4378												
4379	**Gamma Distribution Test**						**Data Distribution**					
4380	k star (bias corrected)				127.3		**Data appear Normal at 5% Significance Level**					
4381	Theta Star				0.00267							
4382	nu star				8909							
4383	Approximate Chi Square Value (.05)				8691		**Nonparametric Statistics**					
4384	Adjusted Level of Significance				0.0425		95% CLT UCL					0.347
4385	Adjusted Chi Square Value				8681		95% Jackknife UCL					0.348
4386							95% Standard Bootstrap UCL					0.347
4387	Anderson-Darling Test Statistic				1.165		95% Bootstrap-t UCL					0.347
4388	Anderson-Darling 5% Critical Value				0.746		95% Hall's Bootstrap UCL					0.347
4389	Kolmogorov-Smirnov Test Statistic				0.205		95% Percentile Bootstrap UCL					0.347
4390	Kolmogorov-Smirnov 5% Critical Value				0.148		95% BCA Bootstrap UCL					0.346
4391	**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.36
4392							97.5% Chebyshev(Mean, Sd) UCL					0.37
4393	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.387
4394	95% Approximate Gamma UCL				0.348							
4395	95% Adjusted Gamma UCL				0.348							
4396												
4397	**Potential UCL to Use**						Use 95% Student's-t UCL					0.348
4398												
4399												

4400	**Hexavalent chromium (mwp-12)**											
4401												
4402						**General Statistics**						
4403					Number of Valid Observations	1			Number of Distinct Observations	1		
4404												
4405												
4406						**Warning: This data set only has 1 observations!**						
4407						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
4408						**The data set for variable Hexavalent chromium (mwp-12) was not processed!**						
4409												
4410						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
4411						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
4412												
4413												
4414												
4415	**Hexavalent chromium (ow-1d)**											
4416												
4417						**General Statistics**						
4418					Number of Valid Data	17			Number of Detected Data	8		
4419					Number of Distinct Detected Data	5			Number of Non-Detect Data	9		
4420									Percent Non-Detects	52.94%		
4421												
4422					**Raw Statistics**				**Log-transformed Statistics**			
4423					Minimum Detected	0.0005			Minimum Detected	-7.601		
4424					Maximum Detected	0.0013			Maximum Detected	-6.645		
4425					Mean of Detected	0.00101			Mean of Detected	-6.939		
4426					SD of Detected	0.0002579			SD of Detected	0.305		
4427					Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908		
4428					Maximum Non-Detect	0.002			Maximum Non-Detect	-6.215		
4429												
4430	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	17		
4431	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	0		
4432	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	100.00%		
4433												
4434						**Warning: There are only 8 Detected Values in this data**						
4435						**Note: It should be noted that even though bootstrap may be performed on this data set**						
4436						**the resulting calculations may not be reliable enough tp draw conclusions**						
4437												
4438						**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**						
4439												
4440												
4441						**UCL Statistics**						
4442					**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**			
4443					Shapiro Wilk Test Statistic	0.9			Shapiro Wilk Test Statistic	0.827		
4444					5% Shapiro Wilk Critical Value	0.818			5% Shapiro Wilk Critical Value	0.818		
4445					**Data appear Normal at 5% Significance Level**				**Data appear Lognormal at 5% Significance Level**			
4446												
4447					**Assuming Normal Distribution**				**Assuming Lognormal Distribution**			
4448					DL/2 Substitution Method				DL/2 Substitution Method			
4449					Mean	0.0007671			Mean	-7.248		
4450					SD	0.0003106			SD	0.397		
4451					95% DL/2 (t) UCL	0.0008986			95% H-Stat (DL/2) UCL	0.0009405		
4452												

4453				Maximum Likelihood Estimate(MLE) Method		N/A					Log ROS Method	
4454				**MLE method failed to converge properly**							Mean in Log Scale	-7.151
4455											SD in Log Scale	0.322
4456											Mean in Original Scale	0.0008228
4457											SD in Original Scale	0.0002615
4458											95% Percentile Bootstrap UCL	0.0009227
4459											95% BCA Bootstrap UCL	0.0009298
4460												
4461				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
4462				k star (bias corrected)		8.886					**Data appear Normal at 5% Significance Level**	
4463				Theta Star		0.0001131						
4464				nu star		142.2						
4465												
4466				A-D Test Statistic		0.556					**Nonparametric Statistics**	
4467				5% A-D Critical Value		0.715					Kaplan-Meier (KM) Method	
4468				K-S Test Statistic		0.715					Mean	0.0008375
4469				5% K-S Critical Value		0.294					SD	0.0002676
4470				**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean	0.0001014
4471											95% KM (t) UCL	0.00101
4472				**Assuming Gamma Distribution**							95% KM (z) UCL	0.001
4473				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.0011
4474				Minimum		0.0005					95% KM (bootstrap t) UCL	0.00105
4475				Maximum		0.0013					95% KM (BCA) UCL	0.00106
4476				Mean		0.00102					95% KM (Percentile Bootstrap) UCL	0.00106
4477				Median		0.00103					95% KM (Chebyshev) UCL	0.00128
4478				SD		0.0001811					97.5% KM (Chebyshev) UCL	0.00147
4479				k star		22.31					99% KM (Chebyshev) UCL	0.00185
4480				Theta star		4.572E-05						
4481				Nu star		758.7					**Potential UCLs to Use**	
4482				AppChi2		695.7					95% KM (t) UCL	0.00101
4483				95% Gamma Approximate UCL		0.00111					95% KM (Percentile Bootstrap) UCL	0.00106
4484				95% Adjusted Gamma UCL		0.00112						
4485	**Note: DL/2 is not a recommended method.**											
4486												
4487												
4488	**Hexavalent chromium (ow-1m)**											
4489												
4490						**General Statistics**							
4491				Number of Valid Data		18					Number of Detected Data	17
4492				Number of Distinct Detected Data		17					Number of Non-Detect Data	1
4493											Percent Non-Detects	5.56%
4494												
4495				**Raw Statistics**							**Log-transformed Statistics**	
4496				Minimum Detected		0.00057					Minimum Detected	-7.47
4497				Maximum Detected		0.0163					Maximum Detected	-4.117
4498				Mean of Detected		0.0055					Mean of Detected	-5.723
4499				SD of Detected		0.00513					SD of Detected	1.129
4500				Minimum Non-Detect		0.001					Minimum Non-Detect	-6.908
4501				Maximum Non-Detect		0.001					Maximum Non-Detect	-6.908
4502												
4503												
4504						**UCL Statistics**							
4505				**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**	

4506					Shapiro Wilk Test Statistic	0.858					Shapiro Wilk Test Statistic	0.923
4507					5% Shapiro Wilk Critical Value	0.892					5% Shapiro Wilk Critical Value	0.892
4508					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
4509												
4510					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
4511					DL/2 Substitution Method						DL/2 Substitution Method	
4512					Mean	0.00522					Mean	-5.827
4513					SD	0.00511					SD	1.182
4514					95% DL/2 (t) UCL	0.00732					95% H-Stat (DL/2) UCL	0.0125
4515												
4516					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
4517					Mean	0.00448					Mean in Log Scale	-5.812
4518					SD	0.00595					SD in Log Scale	1.159
4519					95% MLE (t) UCL	0.00692					Mean in Original Scale	0.00523
4520					95% MLE (Tiku) UCL	0.00697					SD in Original Scale	0.0051
4521											95% Percentile Bootstrap UCL	0.00727
4522											95% BCA Bootstrap UCL	0.00712
4523												
4524					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
4525					k star (bias corrected)	0.944					**Data appear Gamma Distributed at 5% Significance Level**	
4526					Theta Star	0.00583						
4527					nu star	32.08						
4528												
4529					A-D Test Statistic	0.556					**Nonparametric Statistics**	
4530					5% A-D Critical Value	0.764					Kaplan-Meier (KM) Method	
4531					K-S Test Statistic	0.764					Mean	0.00524
4532					5% K-S Critical Value	0.215					SD	0.00496
4533					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0012
4534											95% KM (t) UCL	0.00733
4535					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00722
4536					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00733
4537					Minimum	1E-09					95% KM (bootstrap t) UCL	0.00787
4538					Maximum	0.0163					95% KM (BCA) UCL	0.00704
4539					Mean	0.0052					95% KM (Percentile Bootstrap) UCL	0.00732
4540					Median	0.0031					95% KM (Chebyshev) UCL	0.0105
4541					SD	0.00514					97.5% KM (Chebyshev) UCL	0.0128
4542					k star	0.446					99% KM (Chebyshev) UCL	0.0172
4543					Theta star	0.0116						
4544					Nu star	16.07					**Potential UCLs to Use**	
4545					AppChi2	8.014					95% KM (Chebyshev) UCL	0.0105
4546					95% Gamma Approximate UCL	0.0104						
4547					95% Adjusted Gamma UCL	0.0112						
4548	**Note: DL/2 is not a recommended method.**											
4549												
4550												
4551	**Hexavalent chromium (ow-1s)**											
4552												
4553						**General Statistics**							
4554					Number of Valid Observations	15					Number of Distinct Observations	14
4555												
4556					**Raw Statistics**						**Log-transformed Statistics**	
4557					Minimum	0.0049					Minimum of Log Data	-5.319
4558					Maximum	0.0216					Maximum of Log Data	-3.835

4559					Mean	0.0185					Mean of log Data	-4.031
4560					Median	0.0194					SD of log Data	0.36
4561					SD	0.00391						
4562					Coefficient of Variation	0.211						
4563					Skewness	-3.415						
4564												
4565					**Relevant UCL Statistics**							
4566					**Normal Distribution Test**						**Lognormal Distribution Test**	
4567					Shapiro Wilk Test Statistic	0.541					Shapiro Wilk Test Statistic	0.423
4568					Shapiro Wilk Critical Value	0.881					Shapiro Wilk Critical Value	0.881
4569					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
4570												
4571					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
4572					95% Student's-t UCL	0.0203					95% H-UCL	0.0228
4573					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0266
4574					95% Adjusted-CLT UCL	0.0192					97.5% Chebyshev (MVUE) UCL	0.03
4575					95% Modified-t UCL	0.0201					99% Chebyshev (MVUE) UCL	0.0366
4576												
4577					**Gamma Distribution Test**						**Data Distribution**	
4578					k star (bias corrected)	9.666					**Data do not follow a Discernable Distribution (0.05)**	
4579					Theta Star	0.00192						
4580					nu star	290						
4581					Approximate Chi Square Value (.05)	251.5					**Nonparametric Statistics**	
4582					Adjusted Level of Significance	0.0324					95% CLT UCL	0.0202
4583					Adjusted Chi Square Value	247.1					95% Jackknife UCL	0.0203
4584											95% Standard Bootstrap UCL	0.0201
4585					Anderson-Darling Test Statistic	3.354					95% Bootstrap-t UCL	0.0197
4586					Anderson-Darling 5% Critical Value	0.737					95% Hall's Bootstrap UCL	0.0196
4587					Kolmogorov-Smirnov Test Statistic	0.41					95% Percentile Bootstrap UCL	0.0198
4588					Kolmogorov-Smirnov 5% Critical Value	0.221					95% BCA Bootstrap UCL	0.0196
4589					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0229
4590											97.5% Chebyshev(Mean, Sd) UCL	0.0248
4591					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0286
4592					95% Approximate Gamma UCL	0.0214						
4593					95% Adjusted Gamma UCL	0.0217						
4594												
4595					**Potential UCL to Use**						Use 95% Student's-t UCL	0.0203
4596											or 95% Modified-t UCL	0.0201
4597												
4598												
4599	**Hexavalent chromium (ow-2d)**											
4600												
4601					**General Statistics**							
4602					Number of Valid Data	16					Number of Detected Data	7
4603					Number of Distinct Detected Data	7					Number of Non-Detect Data	9
4604											Percent Non-Detects	56.25%
4605												
4606					**Raw Statistics**						**Log-transformed Statistics**	
4607					Minimum Detected	0.00024					Minimum Detected	-8.335
4608					Maximum Detected	0.00061					Maximum Detected	-7.402
4609					Mean of Detected	0.0004229					Mean of Detected	-7.834
4610					SD of Detected	0.0001585					SD of Detected	0.4
4611					Minimum Non-Detect	0.0002					Minimum Non-Detect	-8.517

4612				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
4613												
4614	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	16	
4615	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
4616	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
4617												
4618	**Warning: There are only 7 Detected Values in this data**											
4619	**Note: It should be noted that even though bootstrap may be performed on this data set**											
4620	**the resulting calculations may not be reliable enough tp draw conclusions**											
4621												
4622	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
4623												
4624												
4625	**UCL Statistics**											
4626	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
4627				Shapiro Wilk Test Statistic	0.868					Shapiro Wilk Test Statistic	0.861	
4628				5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803	
4629	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
4630												
4631	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
4632				DL/2 Substitution Method						DL/2 Substitution Method		
4633				Mean	0.0004163					Mean	-7.904	
4634				SD	0.0001633					SD	0.58	
4635				95% DL/2 (t) UCL	0.0004878					95% H-Stat (DL/2) UCL	0.00074	
4636												
4637				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
4638	**MLE method failed to converge properly**									Mean in Log Scale	-8.044	
4639										SD in Log Scale	0.506	
4640										Mean in Original Scale	0.0003598	
4641										SD in Original Scale	0.0001712	
4642										95% Percentile Bootstrap UCL	0.000431	
4643										95% BCA Bootstrap UCL	0.0004359	
4644												
4645	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
4646				k star (bias corrected)	4.531					**Data appear Normal at 5% Significance Level**		
4647				Theta Star	9.332E-05							
4648				nu star	63.44							
4649												
4650				A-D Test Statistic	0.521					**Nonparametric Statistics**		
4651				5% A-D Critical Value	0.709					Kaplan-Meier (KM) Method		
4652				K-S Test Statistic	0.709					Mean	0.0003822	
4653				5% K-S Critical Value	0.312					SD	0.0001501	
4654	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	5.404E-05	
4655										95% KM (t) UCL	0.000477	
4656	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0004711	
4657				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0004761	
4658				Minimum	0.0001823					95% KM (bootstrap t) UCL	0.0004897	
4659				Maximum	0.0006433					95% KM (BCA) UCL	0.0005043	
4660				Mean	0.0004225					95% KM (Percentile Bootstrap) UCL	0.0004913	
4661				Median	0.0004536					95% KM (Chebyshev) UCL	0.0006178	
4662				SD	0.0001565					97.5% KM (Chebyshev) UCL	0.0007197	
4663				k star	5.737					99% KM (Chebyshev) UCL	0.0009199	
4664				Theta star	7.366E-05							

4665					Nu star	183.6	**Potential UCLs to Use**					
4666					AppChi2	153.2				95% KM (t) UCL	0.000477	
4667					95% Gamma Approximate UCL	0.0005062				95% KM (Percentile Bootstrap) UCL	0.0004913	
4668					95% Adjusted Gamma UCL	0.0005168						
4669	**Note: DL/2 is not a recommended method.**											
4670												
4671												
4672	**Hexavalent chromium (ow-2m)**											
4673												
4674					**General Statistics**							
4675					Number of Valid Observations	16				Number of Distinct Observations	14	
4676												
4677					**Raw Statistics**		**Log-transformed Statistics**					
4678					Minimum	0.00076				Minimum of Log Data	-7.182	
4679					Maximum	0.0077				Maximum of Log Data	-4.867	
4680					Mean	0.00298				Mean of log Data	-6.03	
4681					Median	0.00235				SD of log Data	0.69	
4682					SD	0.00197						
4683					Coefficient of Variation	0.66						
4684					Skewness	0.959						
4685												
4686					**Relevant UCL Statistics**							
4687					**Normal Distribution Test**		**Lognormal Distribution Test**					
4688					Shapiro Wilk Test Statistic	0.905				Shapiro Wilk Test Statistic	0.961	
4689					Shapiro Wilk Critical Value	0.887				Shapiro Wilk Critical Value	0.887	
4690					**Data appear Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**					
4691												
4692					**Assuming Normal Distribution**		**Assuming Lognormal Distribution**					
4693					95% Student's-t UCL	0.00384				95% H-UCL	0.00457	
4694					**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL	0.00538	
4695					95% Adjusted-CLT UCL	0.00391				97.5% Chebyshev (MVUE) UCL	0.00641	
4696					95% Modified-t UCL	0.00386				99% Chebyshev (MVUE) UCL	0.00844	
4697												
4698					**Gamma Distribution Test**		**Data Distribution**					
4699					k star (bias corrected)	2.078	**Data appear Normal at 5% Significance Level**					
4700					Theta Star	0.00143						
4701					nu star	66.48						
4702					Approximate Chi Square Value (.05)	48.72	**Nonparametric Statistics**					
4703					Adjusted Level of Significance	0.0335				95% CLT UCL	0.00379	
4704					Adjusted Chi Square Value	46.99				95% Jackknife UCL	0.00384	
4705										95% Standard Bootstrap UCL	0.00377	
4706					Anderson-Darling Test Statistic	0.312				95% Bootstrap-t UCL	0.00402	
4707					Anderson-Darling 5% Critical Value	0.747				95% Hall's Bootstrap UCL	0.00398	
4708					Kolmogorov-Smirnov Test Statistic	0.149				95% Percentile Bootstrap UCL	0.00381	
4709					Kolmogorov-Smirnov 5% Critical Value	0.217				95% BCA Bootstrap UCL	0.00397	
4710					**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	0.00512	
4711										97.5% Chebyshev(Mean, Sd) UCL	0.00605	
4712					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	0.00787	
4713					95% Approximate Gamma UCL	0.00406						
4714					95% Adjusted Gamma UCL	0.00421						
4715												
4716					**Potential UCL to Use**					Use 95% Student's-t UCL	0.00384	
4717												

4718												
4719	**Hexavalent chromium (ow-2s)**											
4720												
4721	**General Statistics**											
4722						Number of Valid Data	16			Number of Detected Data		15
4723						Number of Distinct Detected Data	15			Number of Non-Detect Data		1
4724										Percent Non-Detects		6.25%
4725												
4726	**Raw Statistics**							**Log-transformed Statistics**				
4727						Minimum Detected	0.0153			Minimum Detected		-4.18
4728						Maximum Detected	0.0404			Maximum Detected		-3.209
4729						Mean of Detected	0.0318			Mean of Detected		-3.482
4730						SD of Detected	0.00736			SD of Detected		0.28
4731						Minimum Non-Detect	0.0002			Minimum Non-Detect		-8.517
4732						Maximum Non-Detect	0.0002			Maximum Non-Detect		-8.517
4733												
4734												
4735	**UCL Statistics**											
4736	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
4737						Shapiro Wilk Test Statistic	0.836			Shapiro Wilk Test Statistic		0.777
4738						5% Shapiro Wilk Critical Value	0.881			5% Shapiro Wilk Critical Value		0.881
4739	**Data not Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**				
4740												
4741	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
4742						DL/2 Substitution Method				DL/2 Substitution Method		
4743						Mean	0.0298			Mean		-3.84
4744						SD	0.0106			SD		1.458
4745						95% DL/2 (t) UCL	0.0345			95% H-Stat (DL/2) UCL		0.138
4746												
4747						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		
4748						Mean	0.0296			Mean in Log Scale		-3.519
4749						SD	0.0109			SD in Log Scale		0.309
4750						95% MLE (t) UCL	0.0344			Mean in Original Scale		0.0308
4751						95% MLE (Tiku) UCL	0.0345			SD in Original Scale		0.00801
4752										95% Percentile Bootstrap UCL		0.0339
4753										95% BCA Bootstrap UCL		0.0337
4754												
4755	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
4756						k star (bias corrected)	12.59	**Data do not follow a Discernable Distribution (0.05)**				
4757						Theta Star	0.00252					
4758						nu star	377.8					
4759												
4760						A-D Test Statistic	1.412	**Nonparametric Statistics**				
4761						5% A-D Critical Value	0.736			Kaplan-Meier (KM) Method		
4762						K-S Test Statistic	0.736			Mean		0.0307
4763						5% K-S Critical Value	0.221			SD		0.00796
4764	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.00206
4765										95% KM (t) UCL		0.0343
4766	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0341
4767						Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL		0.0343
4768						Minimum	0.0143			95% KM (bootstrap t) UCL		0.0337
4769						Maximum	0.0404			95% KM (BCA) UCL		0.0345
4770						Mean	0.0307			95% KM (Percentile Bootstrap) UCL		0.0341

4771					Median	0.0346				95% KM (Chebyshev) UCL		0.0397
4772					SD	0.00835				97.5% KM (Chebyshev) UCL		0.0436
4773					k star	9.158				99% KM (Chebyshev) UCL		0.0512
4774					Theta star	0.00335						
4775					Nu star	293				**Potential UCLs to Use**		
4776					AppChi2	254.4				95% KM (Chebyshev) UCL		0.0397
4777					95% Gamma Approximate UCL	0.0353						
4778					95% Adjusted Gamma UCL	0.0359						
4779	**Note: DL/2 is not a recommended method.**											
4780												
4781												
4782	**Hexavalent chromium (ow-3d)**											
4783												
4784						**General Statistics**						
4785					Number of Valid Data	8				Number of Detected Data		5
4786					Number of Distinct Detected Data	5				Number of Non-Detect Data		3
4787										Percent Non-Detects		37.50%
4788												
4789					**Raw Statistics**					**Log-transformed Statistics**		
4790					Minimum Detected	0.0003				Minimum Detected		-8.112
4791					Maximum Detected	0.0039				Maximum Detected		-5.547
4792					Mean of Detected	0.0025				Mean of Detected		-6.268
4793					SD of Detected	0.00134				SD of Detected		1.044
4794					Minimum Non-Detect	0.0002				Minimum Non-Detect		-8.517
4795					Maximum Non-Detect	0.0002				Maximum Non-Detect		-8.517
4796												
4797												
4798						**Warning: There are only 5 Detected Values in this data**						
4799						**Note: It should be noted that even though bootstrap may be performed on this data set**						
4800						**the resulting calculations may not be reliable enough tp draw conclusions**						
4801												
4802						**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**						
4803												
4804												
4805						**UCL Statistics**						
4806					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
4807					Shapiro Wilk Test Statistic	0.894				Shapiro Wilk Test Statistic		0.707
4808					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
4809					**Data appear Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**		
4810												
4811					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
4812					DL/2 Substitution Method					DL/2 Substitution Method		
4813					Mean	0.0016				Mean		-7.371
4814					SD	0.0016				SD		1.715
4815					95% DL/2 (t) UCL	0.00267				95% H-Stat (DL/2) UCL		0.0061
4816												
4817					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
4818					Mean	0.0011				Mean in Log Scale		-7.126
4819					SD	0.00216				SD in Log Scale		1.456
4820					95% MLE (t) UCL	0.00255				Mean in Original Scale		0.00164
4821					95% MLE (Tiku) UCL	0.00272				SD in Original Scale		0.00156
4822										95% Percentile Bootstrap UCL		0.0025
4823										95% BCA Bootstrap UCL		0.00254

4824												
4825	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
4826					k star (bias corrected)	0.916	**Data appear Normal at 5% Significance Level**					
4827					Theta Star	0.00273						
4828					nu star	9.162						
4829												
4830					A-D Test Statistic	0.742	**Nonparametric Statistics**					
4831					5% A-D Critical Value	0.685	Kaplan-Meier (KM) Method					
4832					K-S Test Statistic	0.685	Mean	0.00168				
4833					5% K-S Critical Value	0.361	SD	0.00143				
4834	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0005638				
4835							95% KM (t) UCL	0.00274				
4836	**Assuming Gamma Distribution**						95% KM (z) UCL	0.0026				
4837	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00301				
4838					Minimum	0.0003	95% KM (bootstrap t) UCL	0.00239				
4839					Maximum	0.0039	95% KM (BCA) UCL	0.00318				
4840					Mean	0.0022	95% KM (Percentile Bootstrap) UCL	0.00308				
4841					Median	0.00236	95% KM (Chebyshev) UCL	0.00413				
4842					SD	0.00113	97.5% KM (Chebyshev) UCL	0.0052				
4843					k star	1.739	99% KM (Chebyshev) UCL	0.00728				
4844					Theta star	0.00127						
4845					Nu star	27.82	**Potential UCLs to Use**					
4846					AppChi2	16.79	95% KM (t) UCL	0.00274				
4847					95% Gamma Approximate UCL	0.00365	95% KM (Percentile Bootstrap) UCL	0.00308				
4848					95% Adjusted Gamma UCL	0.00418						
4849	**Note: DL/2 is not a recommended method.**											
4850												
4851												
4852	**Hexavalent chromium (ow-3m)**											
4853												
4854	**General Statistics**											
4855					Number of Valid Observations	10	Number of Distinct Observations	10				
4856												
4857	**Raw Statistics**						**Log-transformed Statistics**					
4858					Minimum	0.0104	Minimum of Log Data	-4.566				
4859					Maximum	0.0183	Maximum of Log Data	-4.001				
4860					Mean	0.0161	Mean of log Data	-4.144				
4861					Median	0.0169	SD of log Data	0.184				
4862					SD	0.0026						
4863					Coefficient of Variation	0.162						
4864					Skewness	-1.558						
4865												
4866	**Relevant UCL Statistics**											
4867	**Normal Distribution Test**						**Lognormal Distribution Test**					
4868					Shapiro Wilk Test Statistic	0.795	Shapiro Wilk Test Statistic	0.756				
4869					Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842				
4870	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
4871												
4872	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
4873					95% Student's-t UCL	0.0176	95% H-UCL	0.0181				
4874	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0202				
4875					95% Adjusted-CLT UCL	0.017	97.5% Chebyshev (MVUE) UCL	0.022				
4876					95% Modified-t UCL	0.0175	99% Chebyshev (MVUE) UCL	0.0255				

4877												
4878	**Gamma Distribution Test**						**Data Distribution**					
4879					k star (bias corrected)	25.26	**Data do not follow a Discernable Distribution (0.05)**					
4880					Theta Star	0.0006369						
4881					nu star	505.2						
4882					Approximate Chi Square Value (.05)	454.1	**Nonparametric Statistics**					
4883					Adjusted Level of Significance	0.0267					95% CLT UCL	0.0174
4884					Adjusted Chi Square Value	445.7					95% Jackknife UCL	0.0176
4885											95% Standard Bootstrap UCL	0.0174
4886					Anderson-Darling Test Statistic	1.047					95% Bootstrap-t UCL	0.0172
4887					Anderson-Darling 5% Critical Value	0.724					95% Hall's Bootstrap UCL	0.017
4888					Kolmogorov-Smirnov Test Statistic	0.282					95% Percentile Bootstrap UCL	0.0173
4889					Kolmogorov-Smirnov 5% Critical Value	0.266					95% BCA Bootstrap UCL	0.0171
4890	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.0197
4891											97.5% Chebyshev(Mean, Sd) UCL	0.0212
4892	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.0243
4893					95% Approximate Gamma UCL	0.0179						
4894					95% Adjusted Gamma UCL	0.0182						
4895												
4896	**Potential UCL to Use**										Use 95% Student's-t UCL	0.0176
4897											or 95% Modified-t UCL	0.0175
4898												
4899												
4900	**Hexavalent chromium (ow-3s)**											
4901												
4902	**General Statistics**											
4903					Number of Valid Observations	9					Number of Distinct Observations	8
4904												
4905	**Raw Statistics**						**Log-transformed Statistics**					
4906					Minimum	0.0135					Minimum of Log Data	-4.305
4907					Maximum	0.0228					Maximum of Log Data	-3.781
4908					Mean	0.0196					Mean of log Data	-3.943
4909					Median	0.02					SD of log Data	0.166
4910					SD	0.00298						
4911					Coefficient of Variation	0.152						
4912					Skewness	-1.053						
4913												
4914												
4915	**Warning: There are only 9 Values in this data**											
4916	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
4917	**the resulting calculations may not be reliable enough to draw conclusions**											
4918												
4919	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
4920												
4921	**Relevant UCL Statistics**											
4922	**Normal Distribution Test**						**Lognormal Distribution Test**					
4923					Shapiro Wilk Test Statistic	0.905					Shapiro Wilk Test Statistic	0.867
4924					Shapiro Wilk Critical Value	0.829					Shapiro Wilk Critical Value	0.829
4925	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
4926												
4927	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
4928					95% Student's-t UCL	0.0215					95% H-UCL	0.022
4929	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0244

4930					95% Adjusted-CLT UCL	0.0209				97.5% Chebyshev (MVUE) UCL	0.0264	
4931					95% Modified-t UCL	0.0214				99% Chebyshev (MVUE) UCL	0.0304	
4932												
4933					**Gamma Distribution Test**					**Data Distribution**		
4934					k star (bias corrected)	29.2				**Data appear Normal at 5% Significance Level**		
4935					Theta Star	0.0006719						
4936					nu star	525.7						
4937					Approximate Chi Square Value (.05)	473.5				**Nonparametric Statistics**		
4938					Adjusted Level of Significance	0.0231				95% CLT UCL	0.0213	
4939					Adjusted Chi Square Value	463				95% Jackknife UCL	0.0215	
4940										95% Standard Bootstrap UCL	0.0212	
4941					Anderson-Darling Test Statistic	0.449				95% Bootstrap-t UCL	0.0211	
4942					Anderson-Darling 5% Critical Value	0.721				95% Hall's Bootstrap UCL	0.0209	
4943					Kolmogorov-Smirnov Test Statistic	0.159				95% Percentile Bootstrap UCL	0.0211	
4944					Kolmogorov-Smirnov 5% Critical Value	0.279				95% BCA Bootstrap UCL	0.0209	
4945					**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	0.024	
4946										97.5% Chebyshev(Mean, Sd) UCL	0.0258	
4947					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	0.0295	
4948					95% Approximate Gamma UCL	0.0218						
4949					95% Adjusted Gamma UCL	0.0223						
4950												
4951					**Potential UCL to Use**					Use 95% Student's-t UCL	0.0215	
4952												
4953												
4954	**Hexavalent chromium (ow-5d)**											
4955												
4956					**General Statistics**							
4957					Number of Valid Data	16				Number of Detected Data	2	
4958					Number of Distinct Detected Data	2				Number of Non-Detect Data	14	
4959										Percent Non-Detects	87.50%	
4960												
4961					**Raw Statistics**					**Log-transformed Statistics**		
4962					Minimum Detected	0.0011				Minimum Detected	-6.812	
4963					Maximum Detected	0.0015				Maximum Detected	-6.502	
4964					Mean of Detected	0.0013				Mean of Detected	-6.657	
4965					SD of Detected	0.0002828				SD of Detected	0.219	
4966					Minimum Non-Detect	0.0002				Minimum Non-Detect	-8.517	
4967					Maximum Non-Detect	0.001				Maximum Non-Detect	-6.908	
4968												
4969	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	14	
4970	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	2	
4971	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	87.50%	
4972												
4973	**Warning: Data set has only 2 Distinct Detected Values.**											
4974	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
4975	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
4976												
4977	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
4978												
4979	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
4980	**Those methods will return a 'N/A' value on your output display!**											
4981												
4982	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											

	A	B	C	D	E	F	G	H	I	J	K	L
4983	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
4984												
4985												
4986	**UCL Statistics**											
4987	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
4988	Shapiro Wilk Test Statistic					1	Shapiro Wilk Test Statistic					1
4989	5% Shapiro Wilk Critical Value					N/A	5% Shapiro Wilk Critical Value					N/A
4990	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
4991												
4992	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
4993	DL/2 Substitution Method						DL/2 Substitution Method					
4994	Mean					0.000425	Mean					-8.187
4995	SD					0.0003992	SD					0.982
4996	95% DL/2 (t) UCL					0.0005999	95% H-Stat (DL/2) UCL					0.0006175
4997												
4998	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
4999	**MLE method failed to converge properly**						Mean in Log Scale					N/A
5000							SD in Log Scale					N/A
5001							Mean in Original Scale					N/A
5002							SD in Original Scale					N/A
5003							95% Percentile Bootstrap UCL					N/A
5004							95% BCA Bootstrap UCL					N/A
5005												
5006	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
5007	k star (bias corrected)					N/A	**Data do not follow a Discernable Distribution (0.05)**					
5008	Theta Star					N/A						
5009	nu star					N/A						
5010												
5011	A-D Test Statistic					0.359	**Nonparametric Statistics**					
5012	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
5013	K-S Test Statistic					N/A	Mean					0.00113
5014	5% K-S Critical Value					N/A	SD					9.683E-05
5015	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					3.423E-05
5016							95% KM (t) UCL					0.00119
5017	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00118
5018	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00139
5019	Minimum					N/A	95% KM (bootstrap t) UCL					1.8E+308
5020	Maximum					N/A	95% KM (BCA) UCL					0.0015
5021	Mean					N/A	95% KM (Percentile Bootstrap) UCL					N/A
5022	Median					N/A	95% KM (Chebyshev) UCL					0.00127
5023	SD					N/A	97.5% KM (Chebyshev) UCL					0.00134
5024	k star					N/A	99% KM (Chebyshev) UCL					0.00147
5025	Theta star					N/A						
5026	Nu star					N/A	**Potential UCLs to Use**					
5027	AppChi2					N/A	95% KM (t) UCL					0.00119
5028	95% Gamma Approximate UCL					N/A	95% KM (% Bootstrap) UCL					N/A
5029	95% Adjusted Gamma UCL					N/A						
5030	**Note: DL/2 is not a recommended method.**											
5031												
5032												
5033	**Hexavalent chromium (ow-5m)**											
5034												
5035	**General Statistics**											

5036				Number of Valid Data	16					Number of Detected Data	14	
5037				Number of Distinct Detected Data	13					Number of Non-Detect Data	2	
5038										Percent Non-Detects	12.50%	
5039												
5040				**Raw Statistics**						**Log-transformed Statistics**		
5041				Minimum Detected	0.00036					Minimum Detected	-7.929	
5042				Maximum Detected	0.0128					Maximum Detected	-4.358	
5043				Mean of Detected	0.00818					Mean of Detected	-5.083	
5044				SD of Detected	0.00413					SD of Detected	1.004	
5045				Minimum Non-Detect	0.0002					Minimum Non-Detect	-8.517	
5046				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
5047												
5048	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	3	
5049	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	13	
5050	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	18.75%	
5051												
5052					**UCL Statistics**							
5053				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
5054				Shapiro Wilk Test Statistic	0.891					Shapiro Wilk Test Statistic	0.72	
5055				5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874	
5056				**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
5057												
5058				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
5059				DL/2 Substitution Method						DL/2 Substitution Method		
5060				Mean	0.00719					Mean	-5.498	
5061				SD	0.00469					SD	1.499	
5062				95% DL/2 (t) UCL	0.00925					95% H-Stat (DL/2) UCL	0.0274	
5063												
5064				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
5065				Mean	0.00683					Mean in Log Scale	-5.314	
5066				SD	0.00521					SD in Log Scale	1.131	
5067				95% MLE (t) UCL	0.00911					Mean in Original Scale	0.00728	
5068				95% MLE (Tiku) UCL	0.00922					SD in Original Scale	0.00456	
5069										95% Percentile Bootstrap UCL	0.00904	
5070										95% BCA Bootstrap UCL	0.00905	
5071												
5072				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
5073				k star (bias corrected)	1.588					**Data appear Normal at 5% Significance Level**		
5074				Theta Star	0.00515							
5075				nu star	44.45							
5076												
5077				A-D Test Statistic	1.226					**Nonparametric Statistics**		
5078				5% A-D Critical Value	0.746					Kaplan-Meier (KM) Method		
5079				K-S Test Statistic	0.746					Mean	0.0072	
5080				5% K-S Critical Value	0.232					SD	0.00453	
5081				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00118	
5082										95% KM (t) UCL	0.00926	
5083				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00913	
5084				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00921	
5085				Minimum	0.00036					95% KM (bootstrap t) UCL	0.00903	
5086				Maximum	0.0128					95% KM (BCA) UCL	0.00921	
5087				Mean	0.00736					95% KM (Percentile Bootstrap) UCL	0.00923	
5088				Median	0.00875					95% KM (Chebyshev) UCL	0.0123	

5089					SD	0.00445				97.5% KM (Chebyshev) UCL		0.0145
5090					k star	1.334				99% KM (Chebyshev) UCL		0.0189
5091					Theta star	0.00552						
5092					Nu star	42.7				**Potential UCLs to Use**		
5093					AppChi2	28.72				95% KM (t) UCL		0.00926
5094					95% Gamma Approximate UCL	0.0109				95% KM (Percentile Bootstrap) UCL		0.00923
5095					95% Adjusted Gamma UCL	0.0115						
5096	**Note: DL/2 is not a recommended method.**											
5097												
5098												
5099	**Hexavalent chromium (ow-5s)**											
5100												
5101	**General Statistics**											
5102	Number of Valid Observations					16				Number of Distinct Observations		15
5103												
5104	**Raw Statistics**									**Log-transformed Statistics**		
5105	Minimum					0.0223				Minimum of Log Data		-3.803
5106	Maximum					0.0326				Maximum of Log Data		-3.423
5107	Mean					0.0255				Mean of log Data		-3.672
5108	Median					0.0254				SD of log Data		0.0948
5109	SD					0.00254						
5110	Coefficient of Variation					0.0994						
5111	Skewness					1.415						
5112												
5113	**Relevant UCL Statistics**											
5114	**Normal Distribution Test**									**Lognormal Distribution Test**		
5115	Shapiro Wilk Test Statistic					0.891				Shapiro Wilk Test Statistic		0.924
5116	Shapiro Wilk Critical Value					0.887				Shapiro Wilk Critical Value		0.887
5117	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
5118												
5119	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
5120	95% Student's-t UCL					0.0267				95% H-UCL		N/A
5121	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL		0.0282
5122	95% Adjusted-CLT UCL					0.0268				97.5% Chebyshev (MVUE) UCL		0.0293
5123	95% Modified-t UCL					0.0267				99% Chebyshev (MVUE) UCL		0.0316
5124												
5125	**Gamma Distribution Test**									**Data Distribution**		
5126	k star (bias corrected)					93.76				**Data appear Normal at 5% Significance Level**		
5127	Theta Star					0.0002724						
5128	nu star					3000						
5129	Approximate Chi Square Value (.05)					2874				**Nonparametric Statistics**		
5130	Adjusted Level of Significance					0.0335				95% CLT UCL		0.0266
5131	Adjusted Chi Square Value					2860				95% Jackknife UCL		0.0267
5132										95% Standard Bootstrap UCL		0.0266
5133	Anderson-Darling Test Statistic					0.454				95% Bootstrap-t UCL		0.0271
5134	Anderson-Darling 5% Critical Value					0.736				95% Hall's Bootstrap UCL		0.0275
5135	Kolmogorov-Smirnov Test Statistic					0.181				95% Percentile Bootstrap UCL		0.0266
5136	Kolmogorov-Smirnov 5% Critical Value					0.214				95% BCA Bootstrap UCL		0.0268
5137	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL		0.0283
5138										97.5% Chebyshev(Mean, Sd) UCL		0.0295
5139	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL		0.0319
5140	95% Approximate Gamma UCL					0.0267						
5141	95% Adjusted Gamma UCL					0.0268						

5142												
5143	**Potential UCL to Use**										Use 95% Student's-t UCL	0.0267
5144												
5145												
5146	**Hexavalent chromium (park moabi-4)**											
5147												
5148	**General Statistics**											
5149						Number of Valid Data	2				Number of Detected Data	1
5150						Number of Distinct Detected Data	1				Number of Non-Detect Data	1
5151											Percent Non-Detects	50.00%
5152												
5153	**Warning: This data set only has 2 observations!**											
5154	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5155	**The data set for variable Hexavalent chromium (park moabi-4) was not processed!**											
5156												
5157	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5158	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5159												
5160												
5161												
5162	**Hexavalent chromium (pe-1)**											
5163												
5164	**General Statistics**											
5165						Number of Valid Data	24				Number of Detected Data	21
5166						Number of Distinct Detected Data	19				Number of Non-Detect Data	3
5167											Percent Non-Detects	12.50%
5168												
5169	**Raw Statistics**							**Log-transformed Statistics**				
5170						Minimum Detected	0.0471				Minimum Detected	-3.055
5171						Maximum Detected	0.148				Maximum Detected	-1.911
5172						Mean of Detected	0.0941				Mean of Detected	-2.425
5173						SD of Detected	0.0321				SD of Detected	0.37
5174						Minimum Non-Detect	0.001				Minimum Non-Detect	-6.908
5175						Maximum Non-Detect	0.001				Maximum Non-Detect	-6.908
5176												
5177												
5178	**UCL Statistics**											
5179	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
5180						Shapiro Wilk Test Statistic	0.922				Shapiro Wilk Test Statistic	0.899
5181						5% Shapiro Wilk Critical Value	0.908				5% Shapiro Wilk Critical Value	0.908
5182	**Data appear Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**				
5183												
5184	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
5185						DL/2 Substitution Method					DL/2 Substitution Method	
5186						Mean	0.0824				Mean	-3.072
5187						SD	0.0435				SD	1.782
5188						95% DL/2 (t) UCL	0.0976				95% H-Stat (DL/2) UCL	0.553
5189												
5190						Maximum Likelihood Estimate(MLE) Method					Log ROS Method	
5191						Mean	0.0799				Mean in Log Scale	-2.529
5192						SD	0.0479				SD in Log Scale	0.446
5193						95% MLE (t) UCL	0.0967				Mean in Original Scale	0.0872
5194						95% MLE (Tiku) UCL	0.0975				SD in Original Scale	0.0353

5195											95% Percentile Bootstrap UCL	0.0991
5196											95% BCA Bootstrap UCL	0.0984
5197												
5198	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
5199					k star (bias corrected)	7.155	**Data appear Normal at 5% Significance Level**					
5200					Theta Star	0.0131						
5201					nu star	300.5						
5202												
5203					A-D Test Statistic	0.73	**Nonparametric Statistics**					
5204					5% A-D Critical Value	0.744					Kaplan-Meier (KM) Method	
5205					K-S Test Statistic	0.744					Mean	0.0882
5206					5% K-S Critical Value	0.19					SD	0.0332
5207	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00694
5208											95% KM (t) UCL	0.1
5209	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0996
5210					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0999
5211					Minimum	0.0242					95% KM (bootstrap t) UCL	0.1
5212					Maximum	0.148					95% KM (BCA) UCL	0.0998
5213					Mean	0.0871					95% KM (Percentile Bootstrap) UCL	0.099
5214					Median	0.0895					95% KM (Chebyshev) UCL	0.118
5215					SD	0.0356					97.5% KM (Chebyshev) UCL	0.132
5216					k star	4.778					99% KM (Chebyshev) UCL	0.157
5217					Theta star	0.0182						
5218					Nu star	229.3	**Potential UCLs to Use**					
5219					AppChi2	195.3					95% KM (t) UCL	0.1
5220					95% Gamma Approximate UCL	0.102					95% KM (Percentile Bootstrap) UCL	0.099
5221					95% Adjusted Gamma UCL	0.103						
5222	**Note: DL/2 is not a recommended method.**											
5223												
5224												
5225	**Hexavalent chromium (pge-6)**											
5226												
5227	**General Statistics**											
5228					Number of Valid Data	18					Number of Detected Data	13
5229					Number of Distinct Detected Data	13					Number of Non-Detect Data	5
5230											Percent Non-Detects	27.78%
5231												
5232	**Raw Statistics**						**Log-transformed Statistics**					
5233					Minimum Detected	0.16					Minimum Detected	-1.833
5234					Maximum Detected	3.1					Maximum Detected	1.131
5235					Mean of Detected	1.072					Mean of Detected	-0.232
5236					SD of Detected	0.86					SD of Detected	0.842
5237					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
5238					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
5239												
5240												
5241	**UCL Statistics**											
5242	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
5243					Shapiro Wilk Test Statistic	0.87					Shapiro Wilk Test Statistic	0.984
5244					5% Shapiro Wilk Critical Value	0.866					5% Shapiro Wilk Critical Value	0.866
5245	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
5246												
5247	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					

5248				DL/2 Substitution Method						DL/2 Substitution Method		
5249				Mean	0.776					Mean		-1.639
5250				SD	0.874					SD		2.44
5251				95% DL/2 (t) UCL	1.134					95% H-Stat (DL/2) UCL		21.99
5252												
5253				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
5254				Mean	0.584					Mean in Log Scale		-0.804
5255				SD	1.096					SD in Log Scale		1.207
5256				95% MLE (t) UCL	1.033					Mean in Original Scale		0.805
5257				95% MLE (Tiku) UCL	1.056					SD in Original Scale		0.848
5258										95% Percentile Bootstrap UCL		1.156
5259										95% BCA Bootstrap UCL		1.236
5260												
5261			**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**		
5262				k star (bias corrected)	1.44					**Data appear Normal at 5% Significance Level**		
5263				Theta Star	0.744							
5264				nu star	37.45							
5265												
5266				A-D Test Statistic	0.184					**Nonparametric Statistics**		
5267				5% A-D Critical Value	0.746					Kaplan-Meier (KM) Method		
5268				K-S Test Statistic	0.746					Mean		0.819
5269				5% K-S Critical Value	0.24					SD		0.812
5270			**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean		0.199
5271										95% KM (t) UCL		1.165
5272			**Assuming Gamma Distribution**							95% KM (z) UCL		1.147
5273				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1.142
5274				Minimum	1E-09					95% KM (bootstrap t) UCL		1.325
5275				Maximum	3.1					95% KM (BCA) UCL		1.251
5276				Mean	0.856					95% KM (Percentile Bootstrap) UCL		1.183
5277				Median	0.662					95% KM (Chebyshev) UCL		1.687
5278				SD	0.817					97.5% KM (Chebyshev) UCL		2.063
5279				k star	0.409					99% KM (Chebyshev) UCL		2.802
5280				Theta star	2.095							
5281				Nu star	14.72					**Potential UCLs to Use**		
5282				AppChi2	7.065					95% KM (t) UCL		1.165
5283				95% Gamma Approximate UCL	1.784					95% KM (Percentile Bootstrap) UCL		1.183
5284				95% Adjusted Gamma UCL	1.921							
5285	**Note: DL/2 is not a recommended method.**											
5286												
5287												
5288	**Hexavalent chromium (pge-7)**											
5289												
5290						**General Statistics**							
5291				Number of Valid Data	16					Number of Detected Data		15
5292				Number of Distinct Detected Data	15					Number of Non-Detect Data		1
5293										Percent Non-Detects		6.25%
5294												
5295			**Raw Statistics**							**Log-transformed Statistics**		
5296				Minimum Detected	0.827					Minimum Detected		-0.19
5297				Maximum Detected	5.4					Maximum Detected		1.686
5298				Mean of Detected	4.208					Mean of Detected		1.359
5299				SD of Detected	1.22					SD of Detected		0.491
5300				Minimum Non-Detect	0.001					Minimum Non-Detect		-6.908

5301				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
5302												
5303												
5304	**UCL Statistics**											
5305	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
5306				Shapiro Wilk Test Statistic	0.699					Shapiro Wilk Test Statistic	0.565	
5307				5% Shapiro Wilk Critical Value	0.881					5% Shapiro Wilk Critical Value	0.881	
5308	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
5309												
5310	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
5311				DL/2 Substitution Method						DL/2 Substitution Method		
5312				Mean	3.945					Mean	0.799	
5313				SD	1.58					SD	2.29	
5314				95% DL/2 (t) UCL	4.637					95% H-Stat (DL/2) UCL	290	
5315												
5316				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
5317				Mean	3.911					Mean in Log Scale	1.306	
5318				SD	1.624					SD in Log Scale	0.519	
5319				95% MLE (t) UCL	4.623					Mean in Original Scale	4.049	
5320				95% MLE (Tiku) UCL	4.644					SD in Original Scale	1.338	
5321										95% Percentile Bootstrap UCL	4.545	
5322										95% BCA Bootstrap UCL	4.488	
5323												
5324	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
5325				k star (bias corrected)	5.292		**Data do not follow a Discernable Distribution (0.05)**					
5326				Theta Star	0.795							
5327				nu star	158.8							
5328												
5329				A-D Test Statistic	2.602		**Nonparametric Statistics**					
5330				5% A-D Critical Value	0.738					Kaplan-Meier (KM) Method		
5331				K-S Test Statistic	0.738					Mean	3.997	
5332				5% K-S Critical Value	0.222					SD	1.404	
5333	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.363	
5334										95% KM (t) UCL	4.634	
5335	**Assuming Gamma Distribution**									95% KM (z) UCL	4.594	
5336				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	4.64	
5337				Minimum	0.827					95% KM (bootstrap t) UCL	4.5	
5338				Maximum	5.4					95% KM (BCA) UCL	4.649	
5339				Mean	4.045					95% KM (Percentile Bootstrap) UCL	4.622	
5340				Median	4.52					95% KM (Chebyshev) UCL	5.581	
5341				SD	1.347					97.5% KM (Chebyshev) UCL	6.266	
5342				k star	4.484					99% KM (Chebyshev) UCL	7.613	
5343				Theta star	0.902							
5344				Nu star	143.5		**Potential UCLs to Use**					
5345				AppChi2	116.8					95% KM (Chebyshev) UCL	5.581	
5346				95% Gamma Approximate UCL	4.969							
5347				95% Adjusted Gamma UCL	5.088							
5348	**Warning: Recommended UCL exceeds the maximum observation**											
5349	**Note: DL/2 is not a recommended method.**											
5350												
5351												
5352	**Hexavalent chromium (pge-7br)**											
5353												

	A	B	C	D	E	F	G	H	I	J	K	L
5354	**General Statistics**											
5355					Number of Valid Data	2				Number of Detected Data		0
5356					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
5357										Percent Non-Detects		100.00%
5358												
5359	**Warning: This data set only has 2 observations!**											
5360	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5361	**The data set for variable Hexavalent chromium (pge-7br) was not processed!**											
5362												
5363	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5364	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5365												
5366												
5367												
5368	**Hexavalent chromium (pge-8)**											
5369												
5370	**General Statistics**											
5371					Number of Valid Data	19				Number of Detected Data		0
5372					Number of Distinct Detected Data	0				Number of Non-Detect Data		19
5373										Percent Non-Detects		100.00%
5374												
5375	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
5376	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
5377	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
5378												
5379	**The data set for variable Hexavalent chromium (pge-8) was not processed!**											
5380												
5381												
5382												
5383	**Hexavalent chromium (pt-1d)**											
5384												
5385	**General Statistics**											
5386					Number of Valid Observations	2				Number of Distinct Observations		2
5387												
5388												
5389	**Warning: This data set only has 2 observations!**											
5390	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5391	**The data set for variable Hexavalent chromium (pt-1d) was not processed!**											
5392												
5393	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5394	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5395												
5396												
5397												
5398	**Hexavalent chromium (pt-1m)**											
5399												
5400	**General Statistics**											
5401					Number of Valid Data	2				Number of Detected Data		0
5402					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
5403										Percent Non-Detects		100.00%
5404												
5405	**Warning: This data set only has 2 observations!**											
5406	**Data set is too small to compute reliable and meaningful statistics and estimates!**											

	A	B	C	D	E	F	G	H	I	J	K	L
5407	The data set for variable Hexavalent chromium (pt-1m) was not processed!											
5408												
5409	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5410	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5411												
5412												
5413												
5414	Hexavalent chromium (pt-1s)											
5415												
5416	General Statistics											
5417					Number of Valid Data	2			Number of Detected Data	0		
5418					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
5419									Percent Non-Detects	100.00%		
5420												
5421	Warning: This data set only has 2 observations!											
5422	Data set is too small to compute reliable and meaningful statistics and estimates!											
5423	The data set for variable Hexavalent chromium (pt-1s) was not processed!											
5424												
5425	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5426	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5427												
5428												
5429												
5430	Hexavalent chromium (pt-2d)											
5431												
5432	General Statistics											
5433					Number of Valid Observations	2			Number of Distinct Observations	2		
5434												
5435												
5436	Warning: This data set only has 2 observations!											
5437	Data set is too small to compute reliable and meaningful statistics and estimates!											
5438	The data set for variable Hexavalent chromium (pt-2d) was not processed!											
5439												
5440	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5441	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5442												
5443												
5444												
5445	Hexavalent chromium (pt-2m)											
5446												
5447	General Statistics											
5448					Number of Valid Data	2			Number of Detected Data	0		
5449					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
5450									Percent Non-Detects	100.00%		
5451												
5452	Warning: This data set only has 2 observations!											
5453	Data set is too small to compute reliable and meaningful statistics and estimates!											
5454	The data set for variable Hexavalent chromium (pt-2m) was not processed!											
5455												
5456	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5457	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5458												
5459												

	A	B	C	D	E	F	G	H	I	J	K	L
5460												
5461	**Hexavalent chromium (pt-2s)**											
5462												
5463	**General Statistics**											
5464					Number of Valid Data	2			Number of Detected Data			0
5465					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
5466									Percent Non-Detects			100.00%
5467												
5468	**Warning: This data set only has 2 observations!**											
5469	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5470	**The data set for variable Hexavalent chromium (pt-2s) was not processed!**											
5471												
5472	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5473	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5474												
5475												
5476												
5477	**Hexavalent chromium (pt-3d)**											
5478												
5479	**General Statistics**											
5480					Number of Valid Observations	2			Number of Distinct Observations			2
5481												
5482												
5483	**Warning: This data set only has 2 observations!**											
5484	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5485	**The data set for variable Hexavalent chromium (pt-3d) was not processed!**											
5486												
5487	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5488	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5489												
5490												
5491												
5492	**Hexavalent chromium (pt-3m)**											
5493												
5494	**General Statistics**											
5495					Number of Valid Data	2			Number of Detected Data			0
5496					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
5497									Percent Non-Detects			100.00%
5498												
5499	**Warning: This data set only has 2 observations!**											
5500	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5501	**The data set for variable Hexavalent chromium (pt-3m) was not processed!**											
5502												
5503	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5504	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5505												
5506												
5507												
5508	**Hexavalent chromium (pt-3s)**											
5509												
5510	**General Statistics**											
5511					Number of Valid Data	2			Number of Detected Data			0
5512					Number of Distinct Detected Data	0			Number of Non-Detect Data			2

5513											Percent Non-Detects	100.00%
5514												
5515	Warning: This data set only has 2 observations!											
5516	Data set is too small to compute reliable and meaningful statistics and estimates!											
5517	The data set for variable Hexavalent chromium (pt-3s) was not processed!											
5518												
5519	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5520	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5521												
5522												
5523												
5524	Hexavalent chromium (pt-4d)											
5525												
5526	General Statistics											
5527					Number of Valid Observations	1					Number of Distinct Observations	1
5528												
5529												
5530	Warning: This data set only has 1 observations!											
5531	Data set is too small to compute reliable and meaningful statistics and estimates!											
5532	The data set for variable Hexavalent chromium (pt-4d) was not processed!											
5533												
5534	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5535	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5536												
5537												
5538												
5539	Hexavalent chromium (pt-4m)											
5540												
5541	General Statistics											
5542					Number of Valid Data	1					Number of Detected Data	0
5543					Number of Distinct Detected Data	0					Number of Non-Detect Data	1
5544											Percent Non-Detects	100.00%
5545												
5546	Warning: This data set only has 1 observations!											
5547	Data set is too small to compute reliable and meaningful statistics and estimates!											
5548	The data set for variable Hexavalent chromium (pt-4m) was not processed!											
5549												
5550	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5551	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5552												
5553												
5554												
5555	Hexavalent chromium (pt-4s)											
5556												
5557	General Statistics											
5558					Number of Valid Data	1					Number of Detected Data	0
5559					Number of Distinct Detected Data	0					Number of Non-Detect Data	1
5560											Percent Non-Detects	100.00%
5561												
5562	Warning: This data set only has 1 observations!											
5563	Data set is too small to compute reliable and meaningful statistics and estimates!											
5564	The data set for variable Hexavalent chromium (pt-4s) was not processed!											
5565												

	A	B	C	D	E	F	G	H	I	J	K	L
5566	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5567	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5568												
5569												
5570												
5571	Hexavalent chromium (pt-5d)											
5572												
5573	General Statistics											
5574					Number of Valid Data	2			Number of Detected Data	1		
5575					Number of Distinct Detected Data	1			Number of Non-Detect Data	1		
5576									Percent Non-Detects	50.00%		
5577												
5578	Warning: This data set only has 2 observations!											
5579	Data set is too small to compute reliable and meaningful statistics and estimates!											
5580	The data set for variable Hexavalent chromium (pt-5d) was not processed!											
5581												
5582	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5583	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5584												
5585												
5586												
5587	Hexavalent chromium (pt-5m)											
5588												
5589	General Statistics											
5590					Number of Valid Data	2			Number of Detected Data	0		
5591					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
5592									Percent Non-Detects	100.00%		
5593												
5594	Warning: This data set only has 2 observations!											
5595	Data set is too small to compute reliable and meaningful statistics and estimates!											
5596	The data set for variable Hexavalent chromium (pt-5m) was not processed!											
5597												
5598	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5599	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5600												
5601												
5602												
5603	Hexavalent chromium (pt-5s)											
5604												
5605	General Statistics											
5606					Number of Valid Data	2			Number of Detected Data	0		
5607					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
5608									Percent Non-Detects	100.00%		
5609												
5610	Warning: This data set only has 2 observations!											
5611	Data set is too small to compute reliable and meaningful statistics and estimates!											
5612	The data set for variable Hexavalent chromium (pt-5s) was not processed!											
5613												
5614	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5615	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5616												
5617												
5618												

	A	B	C	D	E	F	G	H	I	J	K	L
5619	**Hexavalent chromium (pt-6d)**											
5620												
5621						**General Statistics**						
5622					Number of Valid Observations	2			Number of Distinct Observations	2		
5623												
5624												
5625						**Warning: This data set only has 2 observations!**						
5626						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
5627						**The data set for variable Hexavalent chromium (pt-6d) was not processed!**						
5628												
5629						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
5630						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
5631												
5632												
5633												
5634	**Hexavalent chromium (pt-6m)**											
5635												
5636						**General Statistics**						
5637					Number of Valid Data	2			Number of Detected Data	0		
5638					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
5639									Percent Non-Detects	100.00%		
5640												
5641						**Warning: This data set only has 2 observations!**						
5642						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
5643						**The data set for variable Hexavalent chromium (pt-6m) was not processed!**						
5644												
5645						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
5646						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
5647												
5648												
5649												
5650	**Hexavalent chromium (pt-6s)**											
5651												
5652						**General Statistics**						
5653					Number of Valid Data	2			Number of Detected Data	0		
5654					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
5655									Percent Non-Detects	100.00%		
5656												
5657						**Warning: This data set only has 2 observations!**						
5658						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
5659						**The data set for variable Hexavalent chromium (pt-6s) was not processed!**						
5660												
5661						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
5662						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
5663												
5664												
5665												
5666	**Hexavalent chromium (pt-7d)**											
5667												
5668						**General Statistics**						
5669					Number of Valid Observations	1			Number of Distinct Observations	1		
5670												
5671												

	A	B	C	D	E	F	G	H	I	J	K	L
5672	Warning: This data set only has 1 observations!											
5673	Data set is too small to compute reliable and meaningful statistics and estimates!											
5674	The data set for variable Hexavalent chromium (pt-7d) was not processed!											
5675												
5676	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5677	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5678												
5679												
5680												
5681	Hexavalent chromium (pt-7m)											
5682												
5683	General Statistics											
5684	Number of Valid Observations	1				Number of Distinct Observations	1					
5685												
5686												
5687	Warning: This data set only has 1 observations!											
5688	Data set is too small to compute reliable and meaningful statistics and estimates!											
5689	The data set for variable Hexavalent chromium (pt-7m) was not processed!											
5690												
5691	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5692	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5693												
5694												
5695												
5696	Hexavalent chromium (pt-7s)											
5697												
5698	General Statistics											
5699	Number of Valid Observations	1				Number of Distinct Observations	1					
5700												
5701												
5702	Warning: This data set only has 1 observations!											
5703	Data set is too small to compute reliable and meaningful statistics and estimates!											
5704	The data set for variable Hexavalent chromium (pt-7s) was not processed!											
5705												
5706	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5707	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5708												
5709												
5710												
5711	Hexavalent chromium (pt-8d)											
5712												
5713	General Statistics											
5714	Number of Valid Observations	1				Number of Distinct Observations	1					
5715												
5716												
5717	Warning: This data set only has 1 observations!											
5718	Data set is too small to compute reliable and meaningful statistics and estimates!											
5719	The data set for variable Hexavalent chromium (pt-8d) was not processed!											
5720												
5721	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5722	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5723												
5724												

	A	B	C	D	E	F	G	H	I	J	K	L
5725												
5726	**Hexavalent chromium (pt-8m)**											
5727												
5728	**General Statistics**											
5729	Number of Valid Observations	1					Number of Distinct Observations	1				
5730												
5731												
5732	**Warning: This data set only has 1 observations!**											
5733	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5734	**The data set for variable Hexavalent chromium (pt-8m) was not processed!**											
5735												
5736	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5737	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5738												
5739												
5740												
5741	**Hexavalent chromium (pt-8s)**											
5742												
5743	**General Statistics**											
5744	Number of Valid Observations	1					Number of Distinct Observations	1				
5745												
5746												
5747	**Warning: This data set only has 1 observations!**											
5748	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5749	**The data set for variable Hexavalent chromium (pt-8s) was not processed!**											
5750												
5751	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5752	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5753												
5754												
5755												
5756	**Hexavalent chromium (pt-9d)**											
5757												
5758	**General Statistics**											
5759	Number of Valid Observations	1					Number of Distinct Observations	1				
5760												
5761												
5762	**Warning: This data set only has 1 observations!**											
5763	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5764	**The data set for variable Hexavalent chromium (pt-9d) was not processed!**											
5765												
5766	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5767	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5768												
5769												
5770												
5771	**Hexavalent chromium (pt-9m)**											
5772												
5773	**General Statistics**											
5774	Number of Valid Observations	1					Number of Distinct Observations	1				
5775												
5776												
5777	**Warning: This data set only has 1 observations!**											

	A	B	C	D	E	F	G	H	I	J	K	L
5778	Data set is too small to compute reliable and meaningful statistics and estimates!											
5779	The data set for variable Hexavalent chromium (pt-9m) was not processed!											
5780												
5781	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5782	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5783												
5784												
5785												
5786	Hexavalent chromium (pt-9s)											
5787												
5788	General Statistics											
5789					Number of Valid Observations	1			Number of Distinct Observations	1		
5790												
5791												
5792	Warning: This data set only has 1 observations!											
5793	Data set is too small to compute reliable and meaningful statistics and estimates!											
5794	The data set for variable Hexavalent chromium (pt-9s) was not processed!											
5795												
5796	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5797	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5798												
5799												
5800												
5801	Hexavalent chromium (pti-1d)											
5802												
5803	General Statistics											
5804					Number of Valid Observations	1			Number of Distinct Observations	1		
5805												
5806												
5807	Warning: This data set only has 1 observations!											
5808	Data set is too small to compute reliable and meaningful statistics and estimates!											
5809	The data set for variable Hexavalent chromium (pti-1d) was not processed!											
5810												
5811	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5812	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5813												
5814												
5815												
5816	Hexavalent chromium (pti-1m)											
5817												
5818	General Statistics											
5819					Number of Valid Observations	1			Number of Distinct Observations	1		
5820												
5821												
5822	Warning: This data set only has 1 observations!											
5823	Data set is too small to compute reliable and meaningful statistics and estimates!											
5824	The data set for variable Hexavalent chromium (pti-1m) was not processed!											
5825												
5826	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
5827	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
5828												
5829												
5830												

	A	B	C	D	E	F	G	H	I	J	K	L
5831	**Hexavalent chromium (pti-1s)**											
5832												
5833	**General Statistics**											
5834					Number of Valid Data	1			Number of Detected Data			0
5835					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
5836									Percent Non-Detects			100.00%
5837												
5838	**Warning: This data set only has 1 observations!**											
5839	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5840	**The data set for variable Hexavalent chromium (pti-1s) was not processed!**											
5841												
5842	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5843	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5844												
5845												
5846												
5847	**Hexavalent chromium (ptr-1)**											
5848												
5849	**General Statistics**											
5850					Number of Valid Observations	1			Number of Distinct Observations			1
5851												
5852												
5853	**Warning: This data set only has 1 observations!**											
5854	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5855	**The data set for variable Hexavalent chromium (ptr-1) was not processed!**											
5856												
5857	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5858	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5859												
5860												
5861												
5862	**Hexavalent chromium (ptr-2)**											
5863												
5864	**General Statistics**											
5865					Number of Valid Observations	1			Number of Distinct Observations			1
5866												
5867												
5868	**Warning: This data set only has 1 observations!**											
5869	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5870	**The data set for variable Hexavalent chromium (ptr-2) was not processed!**											
5871												
5872	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5873	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5874												
5875												
5876												
5877	**Hexavalent chromium (tw-1)**											
5878												
5879	**General Statistics**											
5880					Number of Valid Observations	3			Number of Distinct Observations			3
5881												
5882												
5883	**Warning: This data set only has 3 observations!**											

5884	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
5885	**The data set for variable Hexavalent chromium (tw-1) was not processed!**											
5886												
5887	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
5888	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
5889												
5890												
5891												
5892	**Hexavalent chromium (tw-2d)**											
5893												
5894	**General Statistics**											
5895	Number of Valid Observations				12		Number of Distinct Observations					12
5896												
5897	**Raw Statistics**						**Log-transformed Statistics**					
5898	Minimum				0.21		Minimum of Log Data					-1.561
5899	Maximum				7.41		Maximum of Log Data					2.003
5900	Mean				3.243		Mean of log Data					0.762
5901	Median				1.805		SD of log Data					1.072
5902	SD				2.595							
5903	Coefficient of Variation				0.8							
5904	Skewness				0.433							
5905												
5906	**Relevant UCL Statistics**											
5907	**Normal Distribution Test**						**Lognormal Distribution Test**					
5908	Shapiro Wilk Test Statistic				0.847		Shapiro Wilk Test Statistic					0.893
5909	Shapiro Wilk Critical Value				0.859		Shapiro Wilk Critical Value					0.859
5910	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
5911												
5912	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
5913	95% Student's-t UCL				4.588		95% H-UCL					10.19
5914	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					8.716
5915	95% Adjusted-CLT UCL				4.575		97.5% Chebyshev (MVUE) UCL					10.95
5916	95% Modified-t UCL				4.603		99% Chebyshev (MVUE) UCL					15.33
5917												
5918	**Gamma Distribution Test**						**Data Distribution**					
5919	k star (bias corrected)				1.067		**Data appear Gamma Distributed at 5% Significance Level**					
5920	Theta Star				3.038							
5921	nu star				25.61							
5922	Approximate Chi Square Value (.05)				15.08		**Nonparametric Statistics**					
5923	Adjusted Level of Significance				0.029		95% CLT UCL					4.475
5924	Adjusted Chi Square Value				13.86		95% Jackknife UCL					4.588
5925							95% Standard Bootstrap UCL					4.422
5926	Anderson-Darling Test Statistic				0.617		95% Bootstrap-t UCL					4.781
5927	Anderson-Darling 5% Critical Value				0.749		95% Hall's Bootstrap UCL					4.31
5928	Kolmogorov-Smirnov Test Statistic				0.215		95% Percentile Bootstrap UCL					4.527
5929	Kolmogorov-Smirnov 5% Critical Value				0.25		95% BCA Bootstrap UCL					4.53
5930	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					6.508
5931							97.5% Chebyshev(Mean, Sd) UCL					7.92
5932	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					10.7
5933	95% Approximate Gamma UCL				5.507							
5934	95% Adjusted Gamma UCL				5.992							
5935												
5936	**Potential UCL to Use**						Use 95% Approximate Gamma UCL					5.507

	A	B	C	D	E	F	G	H	I	J	K	L
5937												
5938												
5939	**Hexavalent chromium (tw-2s)**											
5940												
5941						**General Statistics**						
5942						Number of Valid Observations	10				Number of Distinct Observations	10
5943												
5944						**Raw Statistics**					**Log-transformed Statistics**	
5945						Minimum	1.25				Minimum of Log Data	0.223
5946						Maximum	7.19				Maximum of Log Data	1.973
5947						Mean	3.792				Mean of log Data	1.213
5948						Median	3.57				SD of log Data	0.536
5949						SD	1.854					
5950						Coefficient of Variation	0.489					
5951						Skewness	0.5					
5952												
5953						**Relevant UCL Statistics**						
5954						**Normal Distribution Test**					**Lognormal Distribution Test**	
5955						Shapiro Wilk Test Statistic	0.974				Shapiro Wilk Test Statistic	0.981
5956						Shapiro Wilk Critical Value	0.842				Shapiro Wilk Critical Value	0.842
5957						**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**	
5958												
5959						**Assuming Normal Distribution**					**Assuming Lognormal Distribution**	
5960						95% Student's-t UCL	4.867				95% H-UCL	5.83
5961						**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL	6.707
5962						95% Adjusted-CLT UCL	4.855				97.5% Chebyshev (MVUE) UCL	7.954
5963						95% Modified-t UCL	4.882				99% Chebyshev (MVUE) UCL	10.4
5964												
5965						**Gamma Distribution Test**					**Data Distribution**	
5966						k star (bias corrected)	3.108				**Data appear Normal at 5% Significance Level**	
5967						Theta Star	1.22					
5968						nu star	62.16					
5969						Approximate Chi Square Value (.05)	45.02				**Nonparametric Statistics**	
5970						Adjusted Level of Significance	0.0267				95% CLT UCL	4.756
5971						Adjusted Chi Square Value	42.5				95% Jackknife UCL	4.867
5972											95% Standard Bootstrap UCL	4.7
5973						Anderson-Darling Test Statistic	0.108				95% Bootstrap-t UCL	4.995
5974						Anderson-Darling 5% Critical Value	0.729				95% Hall's Bootstrap UCL	4.921
5975						Kolmogorov-Smirnov Test Statistic	0.0885				95% Percentile Bootstrap UCL	4.722
5976						Kolmogorov-Smirnov 5% Critical Value	0.268				95% BCA Bootstrap UCL	4.765
5977						**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	6.347
5978											97.5% Chebyshev(Mean, Sd) UCL	7.453
5979						**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	9.625
5980						95% Approximate Gamma UCL	5.235					
5981						95% Adjusted Gamma UCL	5.546					
5982												
5983						**Potential UCL to Use**					Use 95% Student's-t UCL	4.867
5984												
5985												
5986	**Hexavalent chromium (tw-3d)**											
5987												
5988						**General Statistics**						
5989						Number of Valid Observations	22				Number of Distinct Observations	20

5990												
5991	**Raw Statistics**						**Log-transformed Statistics**					
5992					Minimum	1.93					Minimum of Log Data	0.658
5993					Maximum	4.33					Maximum of Log Data	1.466
5994					Mean	2.634					Mean of log Data	0.95
5995					Median	2.495					SD of log Data	0.195
5996					SD	0.553						
5997					Coefficient of Variation	0.21						
5998					Skewness	1.392						
5999												
6000	**Relevant UCL Statistics**											
6001	**Normal Distribution Test**						**Lognormal Distribution Test**					
6002					Shapiro Wilk Test Statistic	0.888					Shapiro Wilk Test Statistic	0.944
6003					Shapiro Wilk Critical Value	0.911					Shapiro Wilk Critical Value	0.911
6004	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
6005												
6006	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
6007					95% Student's-t UCL	2.837					95% H-UCL	2.839
6008	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	3.111
6009					95% Adjusted-CLT UCL	2.865					97.5% Chebyshev (MVUE) UCL	3.319
6010					95% Modified-t UCL	2.843					99% Chebyshev (MVUE) UCL	3.727
6011												
6012	**Gamma Distribution Test**						**Data Distribution**					
6013					k star (bias corrected)	23.01	**Data appear Gamma Distributed at 5% Significance Level**					
6014					Theta Star	0.114						
6015					nu star	1012						
6016					Approximate Chi Square Value (.05)	939.5	**Nonparametric Statistics**					
6017					Adjusted Level of Significance	0.0386					95% CLT UCL	2.828
6018					Adjusted Chi Square Value	934.3					95% Jackknife UCL	2.837
6019											95% Standard Bootstrap UCL	2.83
6020					Anderson-Darling Test Statistic	0.489					95% Bootstrap-t UCL	2.893
6021					Anderson-Darling 5% Critical Value	0.741					95% Hall's Bootstrap UCL	2.961
6022					Kolmogorov-Smirnov Test Statistic	0.136					95% Percentile Bootstrap UCL	2.832
6023					Kolmogorov-Smirnov 5% Critical Value	0.185					95% BCA Bootstrap UCL	2.86
6024	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	3.148
6025											97.5% Chebyshev(Mean, Sd) UCL	3.37
6026	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	3.806
6027					95% Approximate Gamma UCL	2.838						
6028					95% Adjusted Gamma UCL	2.854						
6029												
6030	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	2.838
6031												
6032												
6033	**Hexavalent chromium (tw-4)**											
6034												
6035	**General Statistics**											
6036					Number of Valid Data	6					Number of Detected Data	5
6037					Number of Distinct Detected Data	5					Number of Non-Detect Data	1
6038											Percent Non-Detects	16.67%
6039												
6040	**Raw Statistics**						**Log-transformed Statistics**					
6041					Minimum Detected	0.001					Minimum Detected	-6.908
6042					Maximum Detected	0.0355					Maximum Detected	-3.338

6043				Mean of Detected	0.0242					Mean of Detected	-4.197	
6044				SD of Detected	0.0139					SD of Detected	1.525	
6045				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
6046				Maximum Non-Detect	0.001					Maximum Non-Detect	-6.908	
6047												
6048												
6049					**Warning: There are only 5 Detected Values in this data**							
6050					**Note: It should be noted that even though bootstrap may be performed on this data set**							
6051					**the resulting calculations may not be reliable enough tp draw conclusions**							
6052												
6053					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
6054												
6055												
6056					**UCL Statistics**							
6057				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
6058				Shapiro Wilk Test Statistic	0.844					Shapiro Wilk Test Statistic	0.655	
6059				5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762	
6060				**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
6061												
6062				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
6063				DL/2 Substitution Method						DL/2 Substitution Method		
6064				Mean	0.0203					Mean	-4.765	
6065				SD	0.0158					SD	1.947	
6066				95% DL/2 (t) UCL	0.0333					95% H-Stat (DL/2) UCL	39.21	
6067												
6068				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
6069				Mean	0.0189					Mean in Log Scale	-4.702	
6070				SD	0.0167					SD in Log Scale	1.841	
6071				95% MLE (t) UCL	0.0327					Mean in Original Scale	0.0203	
6072				95% MLE (Tiku) UCL	0.0331					SD in Original Scale	0.0157	
6073										95% Percentile Bootstrap UCL	0.0302	
6074										95% BCA Bootstrap UCL	0.0284	
6075												
6076				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
6077				k star (bias corrected)	0.608					**Data appear Normal at 5% Significance Level**		
6078				Theta Star	0.0399							
6079				nu star	6.076							
6080												
6081				A-D Test Statistic	0.891					**Nonparametric Statistics**		
6082				5% A-D Critical Value	0.69					Kaplan-Meier (KM) Method		
6083				K-S Test Statistic	0.69					Mean	0.0204	
6084				5% K-S Critical Value	0.363					SD	0.0143	
6085				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00652	
6086										95% KM (t) UCL	0.0335	
6087				**Assuming Gamma Distribution**						95% KM (z) UCL	0.0311	
6088				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.035	
6089				Minimum	0.001					95% KM (bootstrap t) UCL	0.0295	
6090				Maximum	0.0355					95% KM (BCA) UCL	0.0325	
6091				Mean	0.0218					95% KM (Percentile Bootstrap) UCL	0.0317	
6092				Median	0.0256					95% KM (Chebyshev) UCL	0.0488	
6093				SD	0.0138					97.5% KM (Chebyshev) UCL	0.0611	
6094				k star	0.742					99% KM (Chebyshev) UCL	0.0853	
6095				Theta star	0.0294							

	A	B	C	D	E	F	G	H	I	J	K	L
6096					Nu star	8.907	**Potential UCLs to Use**					
6097					AppChi2	3.271					95% KM (t) UCL	0.0335
6098					95% Gamma Approximate UCL	0.0594					95% KM (Percentile Bootstrap) UCL	0.0317
6099					95% Adjusted Gamma UCL	0.0897						
6100	**Note: DL/2 is not a recommended method.**											
6101												
6102												
6103	**Hexavalent chromium (tw-5)**											
6104												
6105					**General Statistics**							
6106					Number of Valid Data	4					Number of Detected Data	3
6107					Number of Distinct Detected Data	3					Number of Non-Detect Data	1
6108											Percent Non-Detects	25.00%
6109												
6110	**Warning: This data set only has 4 observations!**											
6111	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
6112	**The data set for variable Hexavalent chromium (tw-5) was not processed!**											
6113												
6114	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
6115	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
6116												
6117												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Lead, dissolved (1)

General Statistics

Number of Valid Data	147	Number of Detected Data	22
Number of Distinct Detected Data	22	Number of Non-Detect Data	125
		Percent Non-Detects	85.03%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.00102	Minimum Detected	-6.888
Maximum Detected	0.00409	Maximum Detected	-5.499
Mean of Detected	0.00199	Mean of Detected	-6.31
SD of Detected	0.0009179	SD of Detected	0.418
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.85	Lilliefors Test Statistic	0.938
5% Lilliefors Critical Value	0.911	5% Lilliefors Critical Value	0.911
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0007224	Mean	-7.408
SD	0.0006357	SD	0.488
95% DL/2 (t) UCL	0.0008092	95% H-Stat (DL/2) UCL	0.0006781
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-7.936
		SD in Log Scale	1.04
		Mean in Original Scale	0.0006036
		SD in Original Scale	0.0007182
		95% Percentile Bootstrap UCL	0.0007052
		95% BCA Bootstrap UCL	0.0007187

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	5.052	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	0.0003931		
nu star	222.3		
A-D Test Statistic	0.641	**Nonparametric Statistics**	
5% A-D Critical Value	0.746	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.746	Mean	0.00116
5% K-S Critical Value	0.186	SD	0.000489

54	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	4.128E-05
55											95% KM (t) UCL	0.00123
56	Assuming Gamma Distribution										95% KM (z) UCL	0.00123
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00122
58	Minimum	0.0002184									95% KM (bootstrap t) UCL	0.00125
59	Maximum	0.00563									95% KM (BCA) UCL	0.00139
60	Mean	0.00378									95% KM (Percentile Bootstrap) UCL	0.00131
61	Median	0.00409									95% KM (Chebyshev) UCL	0.00134
62	SD	0.00141									97.5% KM (Chebyshev) UCL	0.00142
63	k star	4.843									99% KM (Chebyshev) UCL	0.00158
64	Theta star	0.0007805										
65	Nu star	1424									Potential UCLs to Use	
66	AppChi2	1337									95% KM (t) UCL	0.00123
67	95% Gamma Approximate UCL	0.00402										
68	95% Adjusted Gamma UCL	0.00403										
69	Note: DL/2 is not a recommended method.											
70												
71												
72	Lead, dissolved (cw-1d)											
73												
74	General Statistics											
75	Number of Valid Data	8									Number of Detected Data	1
76	Number of Distinct Detected Data	1									Number of Non-Detect Data	7
77											Percent Non-Detects	87.50%
78												
79	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
80	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
81												
82	The data set for variable Lead, dissolved (cw-1d) was not processed!											
83												
84												
85												
86	Lead, dissolved (cw-1m)											
87												
88	General Statistics											
89	Number of Valid Data	8									Number of Detected Data	1
90	Number of Distinct Detected Data	1									Number of Non-Detect Data	7
91											Percent Non-Detects	87.50%
92												
93	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
94	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
95												
96	The data set for variable Lead, dissolved (cw-1m) was not processed!											
97												
98												
99												
100	Lead, dissolved (cw-2d)											
101												
102	General Statistics											
103	Number of Valid Data	8									Number of Detected Data	0
104	Number of Distinct Detected Data	0									Number of Non-Detect Data	8
105											Percent Non-Detects	100.00%
106												

	A	B	C	D	E	F	G	H	I	J	K	L
107	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
108	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
109	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
110												
111	The data set for variable Lead, dissolved (cw-2d) was not processed!											
112												
113												
114												
115	Lead, dissolved (cw-2m)											
116												
117	General Statistics											
118						Number of Valid Data	8			Number of Detected Data	1	
119						Number of Distinct Detected Data	1			Number of Non-Detect Data	7	
120										Percent Non-Detects	87.50%	
121												
122	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
123	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
124												
125	The data set for variable Lead, dissolved (cw-2m) was not processed!											
126												
127												
128												
129	Lead, dissolved (cw-3d)											
130												
131	General Statistics											
132						Number of Valid Data	8			Number of Detected Data	0	
133						Number of Distinct Detected Data	0			Number of Non-Detect Data	8	
134										Percent Non-Detects	100.00%	
135												
136	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
137	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
138	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
139												
140	The data set for variable Lead, dissolved (cw-3d) was not processed!											
141												
142												
143												
144	Lead, dissolved (cw-3m)											
145												
146	General Statistics											
147						Number of Valid Data	8			Number of Detected Data	1	
148						Number of Distinct Detected Data	1			Number of Non-Detect Data	7	
149										Percent Non-Detects	87.50%	
150												
151	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
152	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
153												
154	The data set for variable Lead, dissolved (cw-3m) was not processed!											
155												
156												
157												
158	Lead, dissolved (cw-4d)											
159												

160	**General Statistics**											
161					Number of Valid Data	8				Number of Detected Data	0	
162					Number of Distinct Detected Data	0				Number of Non-Detect Data	8	
163										Percent Non-Detects	100.00%	
164												
165	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
166	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
167	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
168												
169	**The data set for variable Lead, dissolved (cw-4d) was not processed!**											
170												
171												
172												
173	**Lead, dissolved (cw-4m)**											
174												
175	**General Statistics**											
176					Number of Valid Data	8				Number of Detected Data	1	
177					Number of Distinct Detected Data	1				Number of Non-Detect Data	7	
178										Percent Non-Detects	87.50%	
179												
180	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
181	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
182												
183	**The data set for variable Lead, dissolved (cw-4m) was not processed!**											
184												
185												
186												
187	**Lead, dissolved (mw-1)**											
188												
189	**General Statistics**											
190					Number of Valid Data	2				Number of Detected Data	0	
191					Number of Distinct Detected Data	0				Number of Non-Detect Data	2	
192										Percent Non-Detects	100.00%	
193												
194	**Warning: This data set only has 2 observations!**											
195	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
196	**The data set for variable Lead, dissolved (mw-1) was not processed!**											
197												
198	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
199	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
200												
201												
202												
203	**Lead, dissolved (mw-10)**											
204												
205	**General Statistics**											
206					Number of Valid Data	17				Number of Detected Data	6	
207					Number of Distinct Detected Data	5				Number of Non-Detect Data	11	
208										Percent Non-Detects	64.71%	
209												
210	**Raw Statistics**									**Log-transformed Statistics**		
211					Minimum Detected	0.00106				Minimum Detected	-6.849	
212					Maximum Detected	0.008				Maximum Detected	-4.828	

213				Mean of Detected	0.00255					Mean of Detected	-6.265	
214				SD of Detected	0.00269					SD of Detected	0.731	
215				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
216				Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298	
217												
218	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	16	
219	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
220	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	94.12%	
221												
222	**Warning: There are only 6 Detected Values in this data**											
223	**Note: It should be noted that even though bootstrap may be performed on this data set**											
224	**the resulting calculations may not be reliable enough tp draw conclusions**											
225												
226	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
227												
228												
229	**UCL Statistics**											
230	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
231				Shapiro Wilk Test Statistic	0.596					Shapiro Wilk Test Statistic	0.748	
232				5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788	
233	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**		
234												
235	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
236				DL/2 Substitution Method						DL/2 Substitution Method		
237				Mean	0.00182					Mean	-6.582	
238				SD	0.00175					SD	0.714	
239				95% DL/2 (t) UCL	0.00256					95% H-Stat (DL/2) UCL	0.00309	
240												
241				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
242	**MLE method failed to converge properly**									Mean in Log Scale	-6.874	
243										SD in Log Scale	0.781	
244										Mean in Original Scale	0.00146	
245										SD in Original Scale	0.00176	
246										95% Percentile Bootstrap UCL	0.00224	
247										95% BCA Bootstrap UCL	0.00273	
248												
249	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
250				k star (bias corrected)	1.044					**Data do not follow a Discernable Distribution (0.05)**		
251				Theta Star	0.00244							
252				nu star	12.52							
253												
254				A-D Test Statistic	1.018					**Nonparametric Statistics**		
255				5% A-D Critical Value	0.705					Kaplan-Meier (KM) Method		
256				K-S Test Statistic	0.705					Mean	0.0017	
257				5% K-S Critical Value	0.336					SD	0.0016	
258	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0004318	
259										95% KM (t) UCL	0.00245	
260	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00241	
261				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00237	
262				Minimum	0.0001812					95% KM (bootstrap t) UCL	0.00437	
263				Maximum	0.008					95% KM (BCA) UCL	0.00275	
264				Mean	0.0027					95% KM (Percentile Bootstrap) UCL	0.00249	
265				Median	0.00189					95% KM (Chebyshev) UCL	0.00358	

266				SD	0.00211				97.5% KM (Chebyshev) UCL			0.0044
267				k star	1.477				99% KM (Chebyshev) UCL			0.006
268				Theta star	0.00183							
269				Nu star	50.23				**Potential UCLs to Use**			
270				AppChi2	34.96				95% KM (t) UCL			0.00245
271				95% Gamma Approximate UCL	0.00388				95% KM (% Bootstrap) UCL			0.00249
272				95% Adjusted Gamma UCL	0.00403							
273	**Note: DL/2 is not a recommended method.**											
274												
275												
276	**Lead, dissolved (mw-11)**											
277												
278				**General Statistics**								
279				Number of Valid Data	13				Number of Detected Data			3
280				Number of Distinct Detected Data	3				Number of Non-Detect Data			10
281									Percent Non-Detects			76.92%
282												
283				**Raw Statistics**					**Log-transformed Statistics**			
284				Minimum Detected	0.00083				Minimum Detected			-7.094
285				Maximum Detected	0.006				Maximum Detected			-5.116
286				Mean of Detected	0.00269				Mean of Detected			-6.304
287				SD of Detected	0.00288				SD of Detected			1.047
288				Minimum Non-Detect	0.001				Minimum Non-Detect			-6.908
289				Maximum Non-Detect	0.005				Maximum Non-Detect			-5.298
290												
291	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			12
292	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			1
293	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			92.31%
294												
295	**Warning: There are only 3 Distinct Detected Values in this data set**											
296	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
297	**Those methods will return a 'N/A' value on your output display!**											
298												
299	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
300	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
301												
302												
303				**UCL Statistics**								
304				**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**			
305				Shapiro Wilk Test Statistic	0.808				Shapiro Wilk Test Statistic			0.892
306				5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value			0.767
307				**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**			
308												
309				**Assuming Normal Distribution**					**Assuming Lognormal Distribution**			
310				DL/2 Substitution Method					DL/2 Substitution Method			
311				Mean	0.00144				Mean			-6.886
312				SD	0.00154				SD			0.784
313				95% DL/2 (t) UCL	0.0022				95% H-Stat (DL/2) UCL			0.00185
314												
315				Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method			
316				**MLE method failed to converge properly**					Mean in Log Scale			-7.026
317									SD in Log Scale			0.702
318									Mean in Original Scale			0.00122

319											SD in Original Scale	0.00147
320											95% Percentile Bootstrap UCL	0.00199
321											95% BCA Bootstrap UCL	0.00242
322												
323	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
324					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
325					Theta Star	N/A						
326					nu star	N/A						
327												
328					A-D Test Statistic	0.445	**Nonparametric Statistics**					
329					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
330					K-S Test Statistic	N/A					Mean	0.00128
331					5% K-S Critical Value	N/A					SD	0.00137
332	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0004666
333											95% KM (t) UCL	0.00211
334	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00205
335					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00191
336					Minimum	N/A					95% KM (bootstrap t) UCL	0.00474
337					Maximum	N/A					95% KM (BCA) UCL	0.006
338					Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
339					Median	N/A					95% KM (Chebyshev) UCL	0.00331
340					SD	N/A					97.5% KM (Chebyshev) UCL	0.00419
341					k star	N/A					99% KM (Chebyshev) UCL	0.00592
342					Theta star	N/A						
343					Nu star	N/A	**Potential UCLs to Use**					
344					AppChi2	N/A					95% KM (t) UCL	0.00211
345					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	N/A
346					95% Adjusted Gamma UCL	N/A						
347	**Note: DL/2 is not a recommended method.**											
348												
349												
350	**Lead, dissolved (mw-12)**											
351												
352	**General Statistics**											
353					Number of Valid Data	20					Number of Detected Data	4
354					Number of Distinct Detected Data	4					Number of Non-Detect Data	16
355											Percent Non-Detects	80.00%
356												
357	**Raw Statistics**						**Log-transformed Statistics**					
358					Minimum Detected	0.001					Minimum Detected	-6.908
359					Maximum Detected	0.0067					Maximum Detected	-5.006
360					Mean of Detected	0.00428					Mean of Detected	-5.67
361					SD of Detected	0.00251					SD of Detected	0.862
362					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
363					Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298
364												
365	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	18
366	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
367	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	90.00%
368												
369	**Warning: There are only 4 Distinct Detected Values in this data**											
370	**Note: It should be noted that even though bootstrap may be performed on this data set**											
371	**the resulting calculations may not be reliable enough tp draw conclusions**											

	A	B	C	D	E	F	G	H	I	J	K	L
372												
373	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
374												
375												
376	**UCL Statistics**											
377	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
378	Shapiro Wilk Test Statistic					0.953	Shapiro Wilk Test Statistic					0.853
379	5% Shapiro Wilk Critical Value					0.748	5% Shapiro Wilk Critical Value					0.748
380	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
381												
382	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
383	DL/2 Substitution Method						DL/2 Substitution Method					
384	Mean					0.00176	Mean					-6.752
385	SD					0.0018	SD					0.891
386	95% DL/2 (t) UCL					0.00245	95% H-Stat (DL/2) UCL					0.00226
387												
388	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
389	**MLE method failed to converge properly**						Mean in Log Scale					-7.909
390							SD in Log Scale					1.477
391							Mean in Original Scale					0.0011
392							SD in Original Scale					0.00192
393							95% Percentile Bootstrap UCL					0.00187
394							95% BCA Bootstrap UCL					0.00206
395												
396	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
397	k star (bias corrected)					0.786	**Data appear Normal at 5% Significance Level**					
398	Theta Star					0.00544						
399	nu star					6.291						
400												
401	A-D Test Statistic					0.383	**Nonparametric Statistics**					
402	5% A-D Critical Value					0.66	Kaplan-Meier (KM) Method					
403	K-S Test Statistic					0.66	Mean					0.00169
404	5% K-S Critical Value					0.397	SD					0.00165
405	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0004352
406							95% KM (t) UCL					0.00245
407	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00241
408	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00337
409	Minimum					0.001	95% KM (bootstrap t) UCL					0.00208
410	Maximum					0.0188	95% KM (BCA) UCL					0.00585
411	Mean					0.00848	95% KM (Percentile Bootstrap) UCL					0.0058
412	Median					0.00761	95% KM (Chebyshev) UCL					0.00359
413	SD					0.00526	97.5% KM (Chebyshev) UCL					0.00441
414	k star					1.938	99% KM (Chebyshev) UCL					0.00602
415	Theta star					0.00437						
416	Nu star					77.54	**Potential UCLs to Use**					
417	AppChi2					58.25	95% KM (t) UCL					0.00245
418	95% Gamma Approximate UCL					0.0113	95% KM (Percentile Bootstrap) UCL					0.0058
419	95% Adjusted Gamma UCL					N/A						
420	**Note: DL/2 is not a recommended method.**											
421												
422												
423	**Lead, dissolved (mw-13)**											
424												

425	**General Statistics**											
426					Number of Valid Data	5				Number of Detected Data	1	
427					Number of Distinct Detected Data	1				Number of Non-Detect Data	4	
428										Percent Non-Detects	80.00%	
429												
430	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
431	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
432												
433	**The data set for variable Lead, dissolved (mw-13) was not processed!**											
434												
435												
436												
437	**Lead, dissolved (mw-14)**											
438												
439	**General Statistics**											
440					Number of Valid Data	6				Number of Detected Data	3	
441					Number of Distinct Detected Data	3				Number of Non-Detect Data	3	
442										Percent Non-Detects	50.00%	
443												
444				**Raw Statistics**						**Log-transformed Statistics**		
445					Minimum Detected	0.00138				Minimum Detected	-6.586	
446					Maximum Detected	0.0026				Maximum Detected	-5.952	
447					Mean of Detected	0.00206				Mean of Detected	-6.219	
448					SD of Detected	0.0006219				SD of Detected	0.328	
449					Minimum Non-Detect	0.001				Minimum Non-Detect	-6.908	
450					Maximum Non-Detect	0.0208				Maximum Non-Detect	-3.873	
451												
452	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	6	
453	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
454	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
455												
456	**Warning: There are only 3 Distinct Detected Values in this data set**											
457	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
458	**Those methods will return a 'N/A' value on your output display!**											
459												
460	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
461	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
462												
463												
464	**UCL Statistics**											
465				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
466					Shapiro Wilk Test Statistic	0.962				Shapiro Wilk Test Statistic	0.931	
467					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value	0.767	
468				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
469												
470				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
471					DL/2 Substitution Method					DL/2 Substitution Method		
472					Mean	0.00326				Mean	-6.136	
473					SD	0.00359				SD	0.987	
474					95% DL/2 (t) UCL	0.00621				95% H-Stat (DL/2) UCL	0.0618	
475												
476					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
477				**MLE method failed to converge properly**						Mean in Log Scale	-6.438	

478											SD in Log Scale	0.404
479											Mean in Original Scale	0.0017
480											SD in Original Scale	0.0006263
481											95% Percentile Bootstrap UCL	0.00207
482											95% BCA Bootstrap UCL	0.0021
483												
484	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
485					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
486					Theta Star	N/A						
487					nu star	N/A						
488												
489					A-D Test Statistic	0.328	**Nonparametric Statistics**					
490					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
491					K-S Test Statistic	N/A					Mean	0.00189
492					5% K-S Critical Value	N/A					SD	0.0005292
493	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0003241
494											95% KM (t) UCL	0.00254
495	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00242
496					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00264
497					Minimum	N/A					95% KM (bootstrap t) UCL	0.00237
498					Maximum	N/A					95% KM (BCA) UCL	N/A
499					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0026
500					Median	N/A					95% KM (Chebyshev) UCL	0.0033
501					SD	N/A					97.5% KM (Chebyshev) UCL	0.00391
502					k star	N/A					99% KM (Chebyshev) UCL	0.00511
503					Theta star	N/A						
504					Nu star	N/A	**Potential UCLs to Use**					
505					AppChi2	N/A					95% KM (t) UCL	0.00254
506					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0026
507					95% Adjusted Gamma UCL	N/A						
508	**Note: DL/2 is not a recommended method.**											
509												
510												
511	**Lead, dissolved (mw-15)**											
512												
513	**General Statistics**											
514					Number of Valid Data	4	Number of Detected Data	2				
515					Number of Distinct Detected Data	2	Number of Non-Detect Data	2				
516							Percent Non-Detects	50.00%				
517												
518	**Warning: This data set only has 4 observations!**											
519	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
520	**The data set for variable Lead, dissolved (mw-15) was not processed!**											
521												
522	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
523	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
524												
525												
526												
527	**Lead, dissolved (mw-19)**											
528												
529	**General Statistics**											
530					Number of Valid Data	3	Number of Detected Data	0				

531			Number of Distinct Detected Data			0			Number of Non-Detect Data			3
532									Percent Non-Detects			100.00%
533												
534						Warning: This data set only has 3 observations!						
535						Data set is too small to compute reliable and meaningful statistics and estimates!						
536						The data set for variable Lead, dissolved (mw-19) was not processed!						
537												
538						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
539						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
540												
541												
542												
543	Lead, dissolved (mw-20-100)											
544												
545						General Statistics						
546			Number of Valid Data			4			Number of Detected Data			2
547			Number of Distinct Detected Data			2			Number of Non-Detect Data			2
548									Percent Non-Detects			50.00%
549												
550						Warning: This data set only has 4 observations!						
551						Data set is too small to compute reliable and meaningful statistics and estimates!						
552						The data set for variable Lead, dissolved (mw-20-100) was not processed!						
553												
554						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
555						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
556												
557												
558												
559	Lead, dissolved (mw-20-130)											
560												
561						General Statistics						
562			Number of Valid Data			15			Number of Detected Data			1
563			Number of Distinct Detected Data			1			Number of Non-Detect Data			14
564									Percent Non-Detects			93.33%
565												
566						Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!						
567						It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).						
568												
569						The data set for variable Lead, dissolved (mw-20-130) was not processed!						
570												
571												
572												
573	Lead, dissolved (mw-20-70)											
574												
575						General Statistics						
576			Number of Valid Data			16			Number of Detected Data			3
577			Number of Distinct Detected Data			3			Number of Non-Detect Data			13
578									Percent Non-Detects			81.25%
579												
580			Raw Statistics						Log-transformed Statistics			
581			Minimum Detected			0.00137			Minimum Detected			-6.593
582			Maximum Detected			0.003			Maximum Detected			-5.809
583			Mean of Detected			0.00199			Mean of Detected			-6.28

584				SD of Detected	0.0008822					SD of Detected	0.415	
585				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
586				Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298	
587												
588	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	16	
589	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
590	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
591												
592	**Warning: There are only 3 Distinct Detected Values in this data set**											
593	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
594	**Those methods will return a 'N/A' value on your output display!**											
595												
596	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
597	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
598												
599												
600	**UCL Statistics**											
601	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
602				Shapiro Wilk Test Statistic	0.853					Shapiro Wilk Test Statistic	0.892	
603				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
604	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
605												
606	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
607				DL/2 Substitution Method						DL/2 Substitution Method		
608				Mean	0.00125					Mean	-6.915	
609				SD	0.0008932					SD	0.703	
610				95% DL/2 (t) UCL	0.00165					95% H-Stat (DL/2) UCL	0.00159	
611												
612				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
613	**MLE method failed to converge properly**									Mean in Log Scale	-7.251	
614										SD in Log Scale	0.65	
615										Mean in Original Scale	0.0008785	
616										SD in Original Scale	0.0006834	
617										95% Percentile Bootstrap UCL	0.00116	
618										95% BCA Bootstrap UCL	0.00127	
619												
620	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
621				k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**		
622				Theta Star	N/A							
623				nu star	N/A							
624												
625				A-D Test Statistic	0.421					**Nonparametric Statistics**		
626				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
627				K-S Test Statistic	N/A					Mean	0.00152	
628				5% K-S Critical Value	N/A					SD	0.0004331	
629	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0001478	
630										95% KM (t) UCL	0.00178	
631	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00176	
632				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00174	
633				Minimum	N/A					95% KM (bootstrap t) UCL	0.00209	
634				Maximum	N/A					95% KM (BCA) UCL	0.003	
635				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.003	
636				Median	N/A					95% KM (Chebyshev) UCL	0.00216	

637					SD	N/A				97.5% KM (Chebyshev) UCL		0.00244
638					k star	N/A				99% KM (Chebyshev) UCL		0.00299
639					Theta star	N/A						
640					Nu star	N/A				**Potential UCLs to Use**		
641					AppChi2	N/A				95% KM (t) UCL		0.00178
642					95% Gamma Approximate UCL	N/A				95% KM (Percentile Bootstrap) UCL		0.003
643					95% Adjusted Gamma UCL	N/A						
644	**Note: DL/2 is not a recommended method.**											
645												
646												
647	**Lead, dissolved (mw-21)**											
648												
649	**General Statistics**											
650					Number of Valid Data	6				Number of Detected Data		0
651					Number of Distinct Detected Data	0				Number of Non-Detect Data		6
652										Percent Non-Detects		100.00%
653												
654	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
655	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
656	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
657												
658	**The data set for variable Lead, dissolved (mw-21) was not processed!**											
659												
660												
661												
662	**Lead, dissolved (mw-22)**											
663												
664	**General Statistics**											
665					Number of Valid Data	5				Number of Detected Data		1
666					Number of Distinct Detected Data	1				Number of Non-Detect Data		4
667										Percent Non-Detects		80.00%
668												
669	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
670	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
671												
672	**The data set for variable Lead, dissolved (mw-22) was not processed!**											
673												
674												
675												
676	**Lead, dissolved (mw-23)**											
677												
678	**General Statistics**											
679					Number of Valid Data	6				Number of Detected Data		2
680					Number of Distinct Detected Data	2				Number of Non-Detect Data		4
681										Percent Non-Detects		66.67%
682												
683	**Raw Statistics**									**Log-transformed Statistics**		
684					Minimum Detected	0.00426				Minimum Detected		-5.458
685					Maximum Detected	0.027				Maximum Detected		-3.612
686					Mean of Detected	0.0156				Mean of Detected		-4.535
687					SD of Detected	0.0161				SD of Detected		1.306
688					Minimum Non-Detect	0.002				Minimum Non-Detect		-6.215
689					Maximum Non-Detect	0.005				Maximum Non-Detect		-5.298

690												
691	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	5
692	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
693	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	83.33%
694												
695	**Warning: Data set has only 2 Distinct Detected Values.**											
696	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
697	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
698												
699	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
700												
701	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
702	**Those methods will return a 'N/A' value on your output display!**											
703												
704	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
705	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
706												
707												
708	**UCL Statistics**											
709	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
710	Shapiro Wilk Test Statistic				1			Shapiro Wilk Test Statistic				1
711	5% Shapiro Wilk Critical Value				N/A			5% Shapiro Wilk Critical Value				N/A
712	**Data not Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**				
713												
714	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
715	DL/2 Substitution Method							DL/2 Substitution Method				
716	Mean				0.00638			Mean				-5.811
717	SD				0.0102			SD				1.219
718	95% DL/2 (t) UCL				0.0147			95% H-Stat (DL/2) UCL				0.0204
719												
720	Maximum Likelihood Estimate(MLE) Method				N/A			Log ROS Method				
721	**MLE method failed to converge properly**							Mean in Log Scale				N/A
722								SD in Log Scale				N/A
723								Mean in Original Scale				N/A
724								SD in Original Scale				N/A
725								95% Percentile Bootstrap UCL				N/A
726								95% BCA Bootstrap UCL				N/A
727												
728	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
729	k star (bias corrected)				N/A			**Data do not follow a Discernable Distribution (0.05)**				
730	Theta Star				N/A							
731	nu star				N/A							
732												
733	A-D Test Statistic				0.358			**Nonparametric Statistics**				
734	5% A-D Critical Value				N/A			Kaplan-Meier (KM) Method				
735	K-S Test Statistic				N/A			Mean				0.00805
736	5% K-S Critical Value				N/A			SD				0.00847
737	**Data not Gamma Distributed at 5% Significance Level**							SE of Mean				0.00489
738								95% KM (t) UCL				0.0179
739	**Assuming Gamma Distribution**							95% KM (z) UCL				0.0161
740	Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL				0.0258
741	Minimum				N/A			95% KM (bootstrap t) UCL				1.8E+308
742	Maximum				N/A			95% KM (BCA) UCL				0.027

743				Mean	N/A			95% KM (Percentile Bootstrap) UCL				0.027
744				Median	N/A			95% KM (Chebyshev) UCL				0.0294
745				SD	N/A			97.5% KM (Chebyshev) UCL				0.0386
746				k star	N/A			99% KM (Chebyshev) UCL				0.0567
747				Theta star	N/A							
748				Nu star	N/A			**Potential UCLs to Use**				
749				AppChi2	N/A			95% KM (BCA) UCL				0.027
750				95% Gamma Approximate UCL	N/A							
751				95% Adjusted Gamma UCL	N/A							
752	**Note: DL/2 is not a recommended method.**											
753												
754												
755	**Lead, dissolved (mw-24a)**											
756												
757	**General Statistics**											
758				Number of Valid Data	5			Number of Detected Data				0
759				Number of Distinct Detected Data	0			Number of Non-Detect Data				5
760								Percent Non-Detects				100.00%
761												
762	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
763	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
764	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
765												
766	**The data set for variable Lead, dissolved (mw-24a) was not processed!**											
767												
768												
769												
770	**Lead, dissolved (mw-24b)**											
771												
772	**General Statistics**											
773				Number of Valid Data	3			Number of Detected Data				0
774				Number of Distinct Detected Data	0			Number of Non-Detect Data				3
775								Percent Non-Detects				100.00%
776												
777	**Warning: This data set only has 3 observations!**											
778	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
779	**The data set for variable Lead, dissolved (mw-24b) was not processed!**											
780												
781	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
782	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
783												
784												
785												
786	**Lead, dissolved (mw-24br)**											
787												
788	**General Statistics**											
789				Number of Valid Data	2			Number of Detected Data				0
790				Number of Distinct Detected Data	0			Number of Non-Detect Data				2
791								Percent Non-Detects				100.00%
792												
793	**Warning: This data set only has 2 observations!**											
794	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
795	**The data set for variable Lead, dissolved (mw-24br) was not processed!**											

796												
797	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
798	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
799												
800												
801												
802	Lead, dissolved (mw-25)											
803												
804	General Statistics											
805						Number of Valid Data	13	Number of Detected Data	0			
806						Number of Distinct Detected Data	0	Number of Non-Detect Data	13			
807								Percent Non-Detects	100.00%			
808												
809	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
810	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
811	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
812												
813	The data set for variable Lead, dissolved (mw-25) was not processed!											
814												
815												
816												
817	Lead, dissolved (mw-26)											
818												
819	General Statistics											
820						Number of Valid Data	6	Number of Detected Data	1			
821						Number of Distinct Detected Data	1	Number of Non-Detect Data	5			
822								Percent Non-Detects	83.33%			
823												
824	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
825	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
826												
827	The data set for variable Lead, dissolved (mw-26) was not processed!											
828												
829												
830												
831	Lead, dissolved (mw-27-20)											
832												
833	General Statistics											
834						Number of Valid Observations	3	Number of Distinct Observations	3			
835												
836												
837	Warning: This data set only has 3 observations!											
838	Data set is too small to compute reliable and meaningful statistics and estimates!											
839	The data set for variable Lead, dissolved (mw-27-20) was not processed!											
840												
841	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
842	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
843												
844												
845												
846	Lead, dissolved (mw-28-25)											
847												
848	General Statistics											

849				Number of Valid Data	3					Number of Detected Data	2	
850				Number of Distinct Detected Data	2					Number of Non-Detect Data	1	
851										Percent Non-Detects	33.33%	
852												
853						Warning: This data set only has 3 observations!							
854						Data set is too small to compute reliable and meaningful statistics and estimates!							
855						The data set for variable Lead, dissolved (mw-28-25) was not processed!							
856												
857						It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
858						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
859												
860												
861												
862	Lead, dissolved (mw-29)											
863												
864						General Statistics						
865				Number of Valid Data	3					Number of Detected Data	1	
866				Number of Distinct Detected Data	1					Number of Non-Detect Data	2	
867										Percent Non-Detects	66.67%	
868												
869						Warning: This data set only has 3 observations!							
870						Data set is too small to compute reliable and meaningful statistics and estimates!							
871						The data set for variable Lead, dissolved (mw-29) was not processed!							
872												
873						It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
874						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
875												
876												
877												
878	Lead, dissolved (mw-3)											
879												
880						General Statistics						
881				Number of Valid Data	2					Number of Detected Data	0	
882				Number of Distinct Detected Data	0					Number of Non-Detect Data	2	
883										Percent Non-Detects	100.00%	
884												
885						Warning: This data set only has 2 observations!							
886						Data set is too small to compute reliable and meaningful statistics and estimates!							
887						The data set for variable Lead, dissolved (mw-3) was not processed!							
888												
889						It is suggested to collect at least 8 to 10 observations before using these statistical methods!							
890						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.							
891												
892												
893												
894	Lead, dissolved (mw-30-30)											
895												
896						General Statistics						
897				Number of Valid Data	4					Number of Detected Data	2	
898				Number of Distinct Detected Data	2					Number of Non-Detect Data	2	
899										Percent Non-Detects	50.00%	
900												
901						Warning: This data set only has 4 observations!							

	A	B	C	D	E	F	G	H	I	J	K	L
902	Data set is too small to compute reliable and meaningful statistics and estimates!											
903	The data set for variable Lead, dissolved (mw-30-30) was not processed!											
904												
905	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
906	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
907												
908												
909												
910	Lead, dissolved (mw-31-135)											
911												
912	General Statistics											
913						Number of Valid Data	1			Number of Detected Data	0	
914						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
915										Percent Non-Detects	100.00%	
916												
917	Warning: This data set only has 1 observations!											
918	Data set is too small to compute reliable and meaningful statistics and estimates!											
919	The data set for variable Lead, dissolved (mw-31-135) was not processed!											
920												
921	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
922	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
923												
924												
925												
926	Lead, dissolved (mw-31-60)											
927												
928	General Statistics											
929						Number of Valid Data	5			Number of Detected Data	1	
930						Number of Distinct Detected Data	1			Number of Non-Detect Data	4	
931										Percent Non-Detects	80.00%	
932												
933	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
934	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
935												
936	The data set for variable Lead, dissolved (mw-31-60) was not processed!											
937												
938												
939												
940	Lead, dissolved (mw-32-35)											
941												
942	General Statistics											
943						Number of Valid Data	3			Number of Detected Data	0	
944						Number of Distinct Detected Data	0			Number of Non-Detect Data	3	
945										Percent Non-Detects	100.00%	
946												
947	Warning: This data set only has 3 observations!											
948	Data set is too small to compute reliable and meaningful statistics and estimates!											
949	The data set for variable Lead, dissolved (mw-32-35) was not processed!											
950												
951	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
952	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
953												
954												

	A	B	C	D	E	F	G	H	I	J	K	L
955												
956	**Lead, dissolved (mw-33-210)**											
957												
958	**General Statistics**											
959	Number of Valid Data					1	Number of Detected Data					0
960	Number of Distinct Detected Data					0	Number of Non-Detect Data					1
961							Percent Non-Detects					100.00%
962												
963	**Warning: This data set only has 1 observations!**											
964	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
965	**The data set for variable Lead, dissolved (mw-33-210) was not processed!**											
966												
967	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
968	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
969												
970												
971												
972	**Lead, dissolved (mw-33-90)**											
973												
974	**General Statistics**											
975	Number of Valid Data					1	Number of Detected Data					0
976	Number of Distinct Detected Data					0	Number of Non-Detect Data					1
977							Percent Non-Detects					100.00%
978												
979	**Warning: This data set only has 1 observations!**											
980	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
981	**The data set for variable Lead, dissolved (mw-33-90) was not processed!**											
982												
983	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
984	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
985												
986												
987												
988	**Lead, dissolved (mw-34-100)**											
989												
990	**General Statistics**											
991	Number of Valid Data					2	Number of Detected Data					0
992	Number of Distinct Detected Data					0	Number of Non-Detect Data					2
993							Percent Non-Detects					100.00%
994												
995	**Warning: This data set only has 2 observations!**											
996	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
997	**The data set for variable Lead, dissolved (mw-34-100) was not processed!**											
998												
999	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1000	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1001												
1002												
1003												
1004	**Lead, dissolved (mw-34-55)**											
1005												
1006	**General Statistics**											
1007	Number of Valid Data					9	Number of Detected Data					1

1008			Number of Distinct Detected Data			1			Number of Non-Detect Data			8
1009									Percent Non-Detects			88.89%
1010												
1011	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
1012	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
1013												
1014	The data set for variable Lead, dissolved (mw-34-55) was not processed!											
1015												
1016												
1017												
1018	Lead, dissolved (mw-34-80)											
1019												
1020	General Statistics											
1021			Number of Valid Data			13			Number of Detected Data			0
1022			Number of Distinct Detected Data			0			Number of Non-Detect Data			13
1023									Percent Non-Detects			100.00%
1024												
1025	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1026	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1027	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1028												
1029	The data set for variable Lead, dissolved (mw-34-80) was not processed!											
1030												
1031												
1032												
1033	Lead, dissolved (mw-35-135)											
1034												
1035	General Statistics											
1036			Number of Valid Data			2			Number of Detected Data			0
1037			Number of Distinct Detected Data			0			Number of Non-Detect Data			2
1038									Percent Non-Detects			100.00%
1039												
1040	Warning: This data set only has 2 observations!											
1041	Data set is too small to compute reliable and meaningful statistics and estimates!											
1042	The data set for variable Lead, dissolved (mw-35-135) was not processed!											
1043												
1044	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1045	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1046												
1047												
1048												
1049	Lead, dissolved (mw-35-60)											
1050												
1051	General Statistics											
1052			Number of Valid Data			1			Number of Detected Data			0
1053			Number of Distinct Detected Data			0			Number of Non-Detect Data			1
1054									Percent Non-Detects			100.00%
1055												
1056	Warning: This data set only has 1 observations!											
1057	Data set is too small to compute reliable and meaningful statistics and estimates!											
1058	The data set for variable Lead, dissolved (mw-35-60) was not processed!											
1059												
1060	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											

	A	B	C	D	E	F	G	H	I	J	K	L
1061	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1062												
1063												
1064												
1065	Lead, dissolved (mw-37d)											
1066												
1067	General Statistics											
1068						Number of Valid Data	13			Number of Detected Data	0	
1069						Number of Distinct Detected Data	0			Number of Non-Detect Data	13	
1070										Percent Non-Detects	100.00%	
1071												
1072	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
1073	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
1074	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
1075												
1076	The data set for variable Lead, dissolved (mw-37d) was not processed!											
1077												
1078												
1079												
1080	Lead, dissolved (mw-37s)											
1081												
1082	General Statistics											
1083						Number of Valid Data	1			Number of Detected Data	0	
1084						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
1085										Percent Non-Detects	100.00%	
1086												
1087	Warning: This data set only has 1 observations!											
1088	Data set is too small to compute reliable and meaningful statistics and estimates!											
1089	The data set for variable Lead, dissolved (mw-37s) was not processed!											
1090												
1091	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1092	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1093												
1094												
1095												
1096	Lead, dissolved (mw-38d)											
1097												
1098	General Statistics											
1099						Number of Valid Data	1			Number of Detected Data	0	
1100						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
1101										Percent Non-Detects	100.00%	
1102												
1103	Warning: This data set only has 1 observations!											
1104	Data set is too small to compute reliable and meaningful statistics and estimates!											
1105	The data set for variable Lead, dissolved (mw-38d) was not processed!											
1106												
1107	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1108	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1109												
1110												
1111												
1112	Lead, dissolved (mw-38s)											
1113												

1114	**General Statistics**											
1115					Number of Valid Data	1			Number of Detected Data	0		
1116					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
1117									Percent Non-Detects	100.00%		
1118												
1119	**Warning: This data set only has 1 observations!**											
1120	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1121	**The data set for variable Lead, dissolved (mw-38s) was not processed!**											
1122												
1123	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1124	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1125												
1126												
1127												
1128	**Lead, dissolved (mw-39-60)**											
1129												
1130	**General Statistics**											
1131					Number of Valid Data	1			Number of Detected Data	0		
1132					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
1133									Percent Non-Detects	100.00%		
1134												
1135	**Warning: This data set only has 1 observations!**											
1136	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1137	**The data set for variable Lead, dissolved (mw-39-60) was not processed!**											
1138												
1139	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1140	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1141												
1142												
1143												
1144	**Lead, dissolved (mw-4)**											
1145												
1146	**General Statistics**											
1147					Number of Valid Data	2			Number of Detected Data	0		
1148					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
1149									Percent Non-Detects	100.00%		
1150												
1151	**Warning: This data set only has 2 observations!**											
1152	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1153	**The data set for variable Lead, dissolved (mw-4) was not processed!**											
1154												
1155	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1156	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1157												
1158												
1159												
1160	**Lead, dissolved (mw-40d)**											
1161												
1162	**General Statistics**											
1163					Number of Valid Data	1			Number of Detected Data	0		
1164					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
1165									Percent Non-Detects	100.00%		
1166												

	A	B	C	D	E	F	G	H	I	J	K	L
1167	Warning: This data set only has 1 observations!											
1168	Data set is too small to compute reliable and meaningful statistics and estimates!											
1169	The data set for variable Lead, dissolved (mw-40d) was not processed!											
1170												
1171	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1172	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1173												
1174												
1175												
1176	Lead, dissolved (mw-40s)											
1177												
1178	General Statistics											
1179						Number of Valid Data	1			Number of Detected Data	0	
1180						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
1181										Percent Non-Detects	100.00%	
1182												
1183	Warning: This data set only has 1 observations!											
1184	Data set is too small to compute reliable and meaningful statistics and estimates!											
1185	The data set for variable Lead, dissolved (mw-40s) was not processed!											
1186												
1187	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1188	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1189												
1190												
1191												
1192	Lead, dissolved (mw-43-25)											
1193												
1194	General Statistics											
1195						Number of Valid Data	3			Number of Detected Data	1	
1196						Number of Distinct Detected Data	1			Number of Non-Detect Data	2	
1197										Percent Non-Detects	66.67%	
1198												
1199	Warning: This data set only has 3 observations!											
1200	Data set is too small to compute reliable and meaningful statistics and estimates!											
1201	The data set for variable Lead, dissolved (mw-43-25) was not processed!											
1202												
1203	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1204	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1205												
1206												
1207												
1208	Lead, dissolved (mw-44-115)											
1209												
1210	General Statistics											
1211						Number of Valid Data	3			Number of Detected Data	0	
1212						Number of Distinct Detected Data	0			Number of Non-Detect Data	3	
1213										Percent Non-Detects	100.00%	
1214												
1215	Warning: This data set only has 3 observations!											
1216	Data set is too small to compute reliable and meaningful statistics and estimates!											
1217	The data set for variable Lead, dissolved (mw-44-115) was not processed!											
1218												
1219	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											

	A	B	C	D	E	F	G	H	I	J	K	L
1220	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1221												
1222												
1223												
1224	Lead, dissolved (mw-44-125)											
1225												
1226	General Statistics											
1227					Number of Valid Data	1			Number of Detected Data	0		
1228					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
1229									Percent Non-Detects	100.00%		
1230												
1231	Warning: This data set only has 1 observations!											
1232	Data set is too small to compute reliable and meaningful statistics and estimates!											
1233	The data set for variable Lead, dissolved (mw-44-125) was not processed!											
1234												
1235	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1236	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1237												
1238												
1239												
1240	Lead, dissolved (mw-45-095a)											
1241												
1242	General Statistics											
1243					Number of Valid Observations	1			Number of Distinct Observations	1		
1244												
1245												
1246	Warning: This data set only has 1 observations!											
1247	Data set is too small to compute reliable and meaningful statistics and estimates!											
1248	The data set for variable Lead, dissolved (mw-45-095a) was not processed!											
1249												
1250	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1251	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1252												
1253												
1254												
1255	Lead, dissolved (mw-46-175)											
1256												
1257	General Statistics											
1258					Number of Valid Data	1			Number of Detected Data	0		
1259					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
1260									Percent Non-Detects	100.00%		
1261												
1262	Warning: This data set only has 1 observations!											
1263	Data set is too small to compute reliable and meaningful statistics and estimates!											
1264	The data set for variable Lead, dissolved (mw-46-175) was not processed!											
1265												
1266	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1267	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1268												
1269												
1270												
1271	Lead, dissolved (mw-47-55)											
1272												

	A	B	C	D	E	F	G	H	I	J	K	L
1273	General Statistics											
1274					Number of Valid Data	1				Number of Detected Data		0
1275					Number of Distinct Detected Data	0				Number of Non-Detect Data		1
1276										Percent Non-Detects		100.00%
1277												
1278	Warning: This data set only has 1 observations!											
1279	Data set is too small to compute reliable and meaningful statistics and estimates!											
1280	The data set for variable Lead, dissolved (mw-47-55) was not processed!											
1281												
1282	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1283	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1284												
1285												
1286												
1287	Lead, dissolved (mw-48)											
1288												
1289	General Statistics											
1290					Number of Valid Data	3				Number of Detected Data		0
1291					Number of Distinct Detected Data	0				Number of Non-Detect Data		3
1292										Percent Non-Detects		100.00%
1293												
1294	Warning: This data set only has 3 observations!											
1295	Data set is too small to compute reliable and meaningful statistics and estimates!											
1296	The data set for variable Lead, dissolved (mw-48) was not processed!											
1297												
1298	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1299	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1300												
1301												
1302												
1303	Lead, dissolved (mw-5)											
1304												
1305	General Statistics											
1306					Number of Valid Data	2				Number of Detected Data		0
1307					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
1308										Percent Non-Detects		100.00%
1309												
1310	Warning: This data set only has 2 observations!											
1311	Data set is too small to compute reliable and meaningful statistics and estimates!											
1312	The data set for variable Lead, dissolved (mw-5) was not processed!											
1313												
1314	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1315	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1316												
1317												
1318												
1319	Lead, dissolved (mw-50-200)											
1320												
1321	General Statistics											
1322					Number of Valid Data	3				Number of Detected Data		0
1323					Number of Distinct Detected Data	0				Number of Non-Detect Data		3
1324										Percent Non-Detects		100.00%
1325												

	A	B	C	D	E	F	G	H	I	J	K	L
1326	Warning: This data set only has 3 observations!											
1327	Data set is too small to compute reliable and meaningful statistics and estimates!											
1328	The data set for variable Lead, dissolved (mw-50-200) was not processed!											
1329												
1330	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1331	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1332												
1333												
1334												
1335	Lead, dissolved (mw-51)											
1336												
1337	General Statistics											
1338						Number of Valid Data	3				Number of Detected Data	1
1339						Number of Distinct Detected Data	1				Number of Non-Detect Data	2
1340											Percent Non-Detects	66.67%
1341												
1342	Warning: This data set only has 3 observations!											
1343	Data set is too small to compute reliable and meaningful statistics and estimates!											
1344	The data set for variable Lead, dissolved (mw-51) was not processed!											
1345												
1346	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1347	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1348												
1349												
1350												
1351	Lead, dissolved (mw-6)											
1352												
1353	General Statistics											
1354						Number of Valid Data	2				Number of Detected Data	0
1355						Number of Distinct Detected Data	0				Number of Non-Detect Data	2
1356											Percent Non-Detects	100.00%
1357												
1358	Warning: This data set only has 2 observations!											
1359	Data set is too small to compute reliable and meaningful statistics and estimates!											
1360	The data set for variable Lead, dissolved (mw-6) was not processed!											
1361												
1362	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1363	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1364												
1365												
1366												
1367	Lead, dissolved (mw-7)											
1368												
1369	General Statistics											
1370						Number of Valid Data	2				Number of Detected Data	0
1371						Number of Distinct Detected Data	0				Number of Non-Detect Data	2
1372											Percent Non-Detects	100.00%
1373												
1374	Warning: This data set only has 2 observations!											
1375	Data set is too small to compute reliable and meaningful statistics and estimates!											
1376	The data set for variable Lead, dissolved (mw-7) was not processed!											
1377												
1378	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											

	A	B	C	D	E	F	G	H	I	J	K	L
1379	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1380												
1381												
1382												
1383	**Lead, dissolved (mw-8)**											
1384												
1385	**General Statistics**											
1386						Number of Valid Data	2			Number of Detected Data	0	
1387						Number of Distinct Detected Data	0			Number of Non-Detect Data	2	
1388										Percent Non-Detects	100.00%	
1389												
1390	**Warning: This data set only has 2 observations!**											
1391	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1392	**The data set for variable Lead, dissolved (mw-8) was not processed!**											
1393												
1394	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1395	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1396												
1397												
1398												
1399	**Lead, dissolved (mw-9)**											
1400												
1401	**General Statistics**											
1402						Number of Valid Data	5			Number of Detected Data	2	
1403						Number of Distinct Detected Data	2			Number of Non-Detect Data	3	
1404										Percent Non-Detects	60.00%	
1405												
1406				**Raw Statistics**						**Log-transformed Statistics**		
1407						Minimum Detected	0.002			Minimum Detected	-6.215	
1408						Maximum Detected	0.00317			Maximum Detected	-5.754	
1409						Mean of Detected	0.00259			Mean of Detected	-5.984	
1410						SD of Detected	0.0008273			SD of Detected	0.326	
1411						Minimum Non-Detect	0.0021			Minimum Non-Detect	-6.166	
1412						Maximum Non-Detect	0.005			Maximum Non-Detect	-5.298	
1413												
1414	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	5	
1415	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1416	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1417												
1418	**Warning: Data set has only 2 Distinct Detected Values.**											
1419	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
1420	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1421												
1422	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
1423												
1424	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1425	**Those methods will return a 'N/A' value on your output display!**											
1426												
1427	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1428	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1429												
1430												
1431	**UCL Statistics**											

1432	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1433				Shapiro Wilk Test Statistic		1				Shapiro Wilk Test Statistic		1
1434				5% Shapiro Wilk Critical Value		N/A				5% Shapiro Wilk Critical Value		N/A
1435	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1436												
1437	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1438				DL/2 Substitution Method						DL/2 Substitution Method		
1439				Mean		0.00224				Mean		-6.162
1440				SD		0.0007864				SD		0.422
1441				95% DL/2 (t) UCL		0.00299				95% H-Stat (DL/2) UCL		0.00409
1442												
1443				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
1444	**MLE method failed to converge properly**									Mean in Log Scale		N/A
1445										SD in Log Scale		N/A
1446										Mean in Original Scale		N/A
1447										SD in Original Scale		N/A
1448										95% Percentile Bootstrap UCL		N/A
1449										95% BCA Bootstrap UCL		N/A
1450												
1451	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1452				k star (bias corrected)		N/A	**Data do not follow a Discernable Distribution (0.05)**					
1453				Theta Star		N/A						
1454				nu star		N/A						
1455												
1456				A-D Test Statistic		0.359	**Nonparametric Statistics**					
1457				5% A-D Critical Value		N/A				Kaplan-Meier (KM) Method		
1458				K-S Test Statistic		N/A				Mean		0.00239
1459				5% K-S Critical Value		N/A				SD		0.0005515
1460	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.0004503
1461										95% KM (t) UCL		0.00335
1462	**Assuming Gamma Distribution**									95% KM (z) UCL		0.00313
1463				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00355
1464				Minimum		N/A				95% KM (bootstrap t) UCL		1.8E+308
1465				Maximum		N/A				95% KM (BCA) UCL		0.00317
1466				Mean		N/A				95% KM (Percentile Bootstrap) UCL		0.00317
1467				Median		N/A				95% KM (Chebyshev) UCL		0.00435
1468				SD		N/A				97.5% KM (Chebyshev) UCL		0.0052
1469				k star		N/A				99% KM (Chebyshev) UCL		0.00687
1470				Theta star		N/A						
1471				Nu star		N/A	**Potential UCLs to Use**					
1472				AppChi2		N/A				95% KM (t) UCL		0.00335
1473				95% Gamma Approximate UCL		N/A				95% KM (% Bootstrap) UCL		0.00317
1474				95% Adjusted Gamma UCL		N/A						
1475	**Warning: Recommended UCL exceeds the maximum observation**											
1476	**Note: DL/2 is not a recommended method.**											
1477												
1478												
1479	**Lead, dissolved (ow-1d)**											
1480												
1481	**General Statistics**											
1482				Number of Valid Data		15				Number of Detected Data		0
1483				Number of Distinct Detected Data		0				Number of Non-Detect Data		15
1484										Percent Non-Detects		100.00%

1485												
1486	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
1487	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
1488	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1489												
1490	**The data set for variable Lead, dissolved (ow-1d) was not processed!**											
1491												
1492												
1493												
1494	**Lead, dissolved (ow-1m)**											
1495												
1496	**General Statistics**											
1497				Number of Valid Data	15			Number of Detected Data	1			
1498				Number of Distinct Detected Data	1			Number of Non-Detect Data	14			
1499								Percent Non-Detects	93.33%			
1500												
1501	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
1502	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
1503												
1504	**The data set for variable Lead, dissolved (ow-1m) was not processed!**											
1505												
1506												
1507												
1508	**Lead, dissolved (ow-1s)**											
1509												
1510	**General Statistics**											
1511				Number of Valid Data	13			Number of Detected Data	2			
1512				Number of Distinct Detected Data	2			Number of Non-Detect Data	11			
1513								Percent Non-Detects	84.62%			
1514												
1515				**Raw Statistics**				**Log-transformed Statistics**				
1516				Minimum Detected	0.0026			Minimum Detected	-5.952			
1517				Maximum Detected	0.0047			Maximum Detected	-5.36			
1518				Mean of Detected	0.00365			Mean of Detected	-5.656			
1519				SD of Detected	0.00148			SD of Detected	0.419			
1520				Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908			
1521				Maximum Non-Detect	0.0031			Maximum Non-Detect	-5.776			
1522												
1523	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect	12			
1524	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected	1			
1525	Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	92.31%			
1526												
1527	**Warning: Data set has only 2 Distinct Detected Values.**											
1528	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
1529	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1530												
1531	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
1532												
1533	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1534	**Those methods will return a 'N/A' value on your output display!**											
1535												
1536	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1537	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											

	A	B	C	D	E	F	G	H	I	J	K	L
1538												
1539												
1540	**UCL Statistics**											
1541	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1542					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
1543					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
1544	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1545												
1546	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1547					DL/2 Substitution Method						DL/2 Substitution Method	
1548					Mean	0.00138					Mean	-6.777
1549					SD	0.00112					SD	0.595
1550					95% DL/2 (t) UCL	0.00194					95% H-Stat (DL/2) UCL	0.00152
1551												
1552					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1553	**MLE method failed to converge properly**										Mean in Log Scale	N/A
1554											SD in Log Scale	N/A
1555											Mean in Original Scale	N/A
1556											SD in Original Scale	N/A
1557											95% Percentile Bootstrap UCL	N/A
1558											95% BCA Bootstrap UCL	N/A
1559												
1560	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1561					k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**					
1562					Theta Star	N/A						
1563					nu star	N/A						
1564												
1565					A-D Test Statistic	0.359	**Nonparametric Statistics**					
1566					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
1567					K-S Test Statistic	N/A					Mean	0.00276
1568					5% K-S Critical Value	N/A					SD	0.0005596
1569	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0002195
1570											95% KM (t) UCL	0.00315
1571	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00312
1572					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00419
1573					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
1574					Maximum	N/A					95% KM (BCA) UCL	0.0047
1575					Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
1576					Median	N/A					95% KM (Chebyshev) UCL	0.00372
1577					SD	N/A					97.5% KM (Chebyshev) UCL	0.00413
1578					k star	N/A					99% KM (Chebyshev) UCL	0.00495
1579					Theta star	N/A						
1580					Nu star	N/A	**Potential UCLs to Use**					
1581					AppChi2	N/A					95% KM (t) UCL	0.00315
1582					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A
1583					95% Adjusted Gamma UCL	N/A						
1584	**Note: DL/2 is not a recommended method.**											
1585												
1586												
1587	**Lead, dissolved (ow-2d)**											
1588												
1589	**General Statistics**											
1590					Number of Valid Data	14					Number of Detected Data	2

Number of Distinct Detected Data	2	Number of Non-Detect Data 12
		Percent Non-Detects 85.71%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0024	Minimum Detected	-6.032
Maximum Detected	0.0029	Maximum Detected	-5.843
Mean of Detected	0.00265	Mean of Detected	-5.938
SD of Detected	0.0003536	SD of Detected	0.134
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.005	Maximum Non-Detect	-5.298
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	14
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00129	Mean	-6.808
SD	0.0007717	SD	0.573
95% DL/2 (t) UCL	0.00165	95% H-Stat (DL/2) UCL	0.00164
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		

1644				A-D Test Statistic	0.359	**Nonparametric Statistics**						
1645				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
1646				K-S Test Statistic	N/A					Mean	0.00244	
1647				5% K-S Critical Value	N/A					SD	0.0001382	
1648			**Data not Gamma Distributed at 5% Significance Level**							SE of Mean	5.642E-05	
1649										95% KM (t) UCL	0.00254	
1650			**Assuming Gamma Distribution**							95% KM (z) UCL	0.00253	
1651				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00278	
1652				Minimum	N/A					95% KM (bootstrap t) UCL	0.00245	
1653				Maximum	N/A					95% KM (BCA) UCL	0.0029	
1654				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
1655				Median	N/A					95% KM (Chebyshev) UCL	0.00269	
1656				SD	N/A					97.5% KM (Chebyshev) UCL	0.00279	
1657				k star	N/A					99% KM (Chebyshev) UCL	0.003	
1658				Theta star	N/A							
1659				Nu star	N/A	**Potential UCLs to Use**						
1660				AppChi2	N/A					95% KM (t) UCL	0.00254	
1661				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A	
1662				95% Adjusted Gamma UCL	N/A							
1663	**Note: DL/2 is not a recommended method.**											
1664												
1665												
1666	**Lead, dissolved (ow-2m)**											
1667												
1668					**General Statistics**							
1669				Number of Valid Data	13	Number of Detected Data	1					
1670				Number of Distinct Detected Data	1	Number of Non-Detect Data	12					
1671						Percent Non-Detects	92.31%					
1672												
1673	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
1674	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
1675												
1676	**The data set for variable Lead, dissolved (ow-2m) was not processed!**											
1677												
1678												
1679												
1680	**Lead, dissolved (ow-2s)**											
1681												
1682					**General Statistics**							
1683				Number of Valid Data	13	Number of Detected Data	0					
1684				Number of Distinct Detected Data	0	Number of Non-Detect Data	13					
1685						Percent Non-Detects	100.00%					
1686												
1687	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
1688	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
1689	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1690												
1691	**The data set for variable Lead, dissolved (ow-2s) was not processed!**											
1692												
1693												
1694												
1695	**Lead, dissolved (ow-3d)**											
1696												

	A	B	C	D	E	F	G	H	I	J	K	L
1697	General Statistics											
1698					Number of Valid Data	2				Number of Detected Data		1
1699					Number of Distinct Detected Data	1				Number of Non-Detect Data		1
1700										Percent Non-Detects		50.00%
1701												
1702	Warning: This data set only has 2 observations!											
1703	Data set is too small to compute reliable and meaningful statistics and estimates!											
1704	The data set for variable Lead, dissolved (ow-3d) was not processed!											
1705												
1706	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1707	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1708												
1709												
1710												
1711	Lead, dissolved (ow-3m)											
1712												
1713	General Statistics											
1714					Number of Valid Data	4				Number of Detected Data		0
1715					Number of Distinct Detected Data	0				Number of Non-Detect Data		4
1716										Percent Non-Detects		100.00%
1717												
1718	Warning: This data set only has 4 observations!											
1719	Data set is too small to compute reliable and meaningful statistics and estimates!											
1720	The data set for variable Lead, dissolved (ow-3m) was not processed!											
1721												
1722	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1723	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1724												
1725												
1726												
1727	Lead, dissolved (ow-3s)											
1728												
1729	General Statistics											
1730					Number of Valid Data	3				Number of Detected Data		1
1731					Number of Distinct Detected Data	1				Number of Non-Detect Data		2
1732										Percent Non-Detects		66.67%
1733												
1734	Warning: This data set only has 3 observations!											
1735	Data set is too small to compute reliable and meaningful statistics and estimates!											
1736	The data set for variable Lead, dissolved (ow-3s) was not processed!											
1737												
1738	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1739	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1740												
1741												
1742												
1743	Lead, dissolved (ow-5d)											
1744												
1745	General Statistics											
1746					Number of Valid Data	14				Number of Detected Data		1
1747					Number of Distinct Detected Data	1				Number of Non-Detect Data		13
1748										Percent Non-Detects		92.86%
1749												

	A	B	C	D	E	F	G	H	I	J	K	L
1750	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
1751	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
1752												
1753	The data set for variable Lead, dissolved (ow-5d) was not processed!											
1754												
1755												
1756												
1757	Lead, dissolved (ow-5m)											
1758												
1759	General Statistics											
1760						Number of Valid Data	14			Number of Detected Data	1	
1761						Number of Distinct Detected Data	1			Number of Non-Detect Data	13	
1762										Percent Non-Detects	92.86%	
1763												
1764	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
1765	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
1766												
1767	The data set for variable Lead, dissolved (ow-5m) was not processed!											
1768												
1769												
1770												
1771	Lead, dissolved (ow-5s)											
1772												
1773	General Statistics											
1774						Number of Valid Data	14			Number of Detected Data	1	
1775						Number of Distinct Detected Data	1			Number of Non-Detect Data	13	
1776										Percent Non-Detects	92.86%	
1777												
1778	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
1779	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
1780												
1781	The data set for variable Lead, dissolved (ow-5s) was not processed!											
1782												
1783												
1784												
1785	Lead, dissolved (park moabi-4)											
1786												
1787	General Statistics											
1788						Number of Valid Data	1			Number of Detected Data	0	
1789						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
1790										Percent Non-Detects	100.00%	
1791												
1792	Warning: This data set only has 1 observations!											
1793	Data set is too small to compute reliable and meaningful statistics and estimates!											
1794	The data set for variable Lead, dissolved (park moabi-4) was not processed!											
1795												
1796	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1797	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1798												
1799												
1800												
1801	Lead, dissolved (pge-6)											
1802												

	A	B	C	D	E	F	G	H	I	J	K	L
1803	General Statistics											
1804					Number of Valid Data	3				Number of Detected Data		1
1805					Number of Distinct Detected Data	1				Number of Non-Detect Data		2
1806										Percent Non-Detects		66.67%
1807												
1808	Warning: This data set only has 3 observations!											
1809	Data set is too small to compute reliable and meaningful statistics and estimates!											
1810	The data set for variable Lead, dissolved (pge-6) was not processed!											
1811												
1812	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1813	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1814												
1815												
1816												
1817	Lead, dissolved (pge-7)											
1818												
1819	General Statistics											
1820					Number of Valid Data	2				Number of Detected Data		0
1821					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
1822										Percent Non-Detects		100.00%
1823												
1824	Warning: This data set only has 2 observations!											
1825	Data set is too small to compute reliable and meaningful statistics and estimates!											
1826	The data set for variable Lead, dissolved (pge-7) was not processed!											
1827												
1828	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1829	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1830												
1831												
1832												
1833	Lead, dissolved (pge-8)											
1834												
1835	General Statistics											
1836					Number of Valid Data	3				Number of Detected Data		0
1837					Number of Distinct Detected Data	0				Number of Non-Detect Data		3
1838										Percent Non-Detects		100.00%
1839												
1840	Warning: This data set only has 3 observations!											
1841	Data set is too small to compute reliable and meaningful statistics and estimates!											
1842	The data set for variable Lead, dissolved (pge-8) was not processed!											
1843												
1844	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1845	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1846												
1847												
1848												
1849	Lead, dissolved (tw-1)											
1850												
1851	General Statistics											
1852					Number of Valid Data	4				Number of Detected Data		1
1853					Number of Distinct Detected Data	1				Number of Non-Detect Data		3
1854										Percent Non-Detects		75.00%
1855												

	A	B	C	D	E	F	G	H	I	J	K	L
1856	Warning: This data set only has 4 observations!											
1857	Data set is too small to compute reliable and meaningful statistics and estimates!											
1858	The data set for variable Lead, dissolved (tw-1) was not processed!											
1859												
1860	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1861	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1862												
1863												
1864												
1865	Lead, dissolved (tw-2d)											
1866												
1867	General Statistics											
1868						Number of Valid Data	3			Number of Detected Data	0	
1869						Number of Distinct Detected Data	0			Number of Non-Detect Data	3	
1870										Percent Non-Detects	100.00%	
1871												
1872	Warning: This data set only has 3 observations!											
1873	Data set is too small to compute reliable and meaningful statistics and estimates!											
1874	The data set for variable Lead, dissolved (tw-2d) was not processed!											
1875												
1876	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1877	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1878												
1879												
1880												
1881	Lead, dissolved (tw-2s)											
1882												
1883	General Statistics											
1884						Number of Valid Data	3			Number of Detected Data	0	
1885						Number of Distinct Detected Data	0			Number of Non-Detect Data	3	
1886										Percent Non-Detects	100.00%	
1887												
1888	Warning: This data set only has 3 observations!											
1889	Data set is too small to compute reliable and meaningful statistics and estimates!											
1890	The data set for variable Lead, dissolved (tw-2s) was not processed!											
1891												
1892	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1893	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1894												
1895												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Molybdenum, dissolved (1)

General Statistics

Number of Valid Data	149	Number of Detected Data	148
Number of Distinct Detected Data	131	Number of Non-Detect Data	1
		Percent Non-Detects	0.67%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.0035	Minimum Detected	-5.655
Maximum Detected	0.0417	Maximum Detected	-3.177
Mean of Detected	0.0113	Mean of Detected	-4.665
SD of Detected	0.00752	SD of Detected	0.579
Minimum Non-Detect	0.00758	Minimum Non-Detect	-4.882
Maximum Non-Detect	0.00758	Maximum Non-Detect	-4.882

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.172	Lilliefors Test Statistic	0.117
5% Lilliefors Critical Value	0.0728	5% Lilliefors Critical Value	0.0728
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0112	Mean	-4.671
SD	0.00752	SD	0.582
95% DL/2 (t) UCL	0.0122	95% H-Stat (DL/2) UCL	0.0122
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00831	Mean in Log Scale	-4.668
SD	0.0108	SD in Log Scale	0.579
95% MLE (t) UCL	0.00977	Mean in Original Scale	0.0112
95% MLE (Tiku) UCL	0.01	SD in Original Scale	0.00751
		95% Percentile Bootstrap UCL	0.0122
		95% BCA Bootstrap UCL	0.0123

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	2.908	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.00387		
nu star	860.7		
A-D Test Statistic	3.091	**Nonparametric Statistics**	
5% A-D Critical Value	0.76	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.76	Mean	0.0112
5% K-S Critical Value	0.0776	SD	0.00748

54	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.0006152
55											95% KM (t) UCL	0.0122
56	Assuming Gamma Distribution										95% KM (z) UCL	0.0122
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0122
58	Minimum	0.0035									95% KM (bootstrap t) UCL	0.0123
59	Maximum	0.0417									95% KM (BCA) UCL	0.0122
60	Mean	0.0112									95% KM (Percentile Bootstrap) UCL	0.0123
61	Median	0.00858									95% KM (Chebyshev) UCL	0.0139
62	SD	0.0075									97.5% KM (Chebyshev) UCL	0.0151
63	k star	2.916									99% KM (Chebyshev) UCL	0.0173
64	Theta star	0.00385										
65	Nu star	868.8									Potential UCLs to Use	
66	AppChi2	801.4									95% KM (BCA) UCL	0.0122
67	95% Gamma Approximate UCL	0.0122										
68	95% Adjusted Gamma UCL	0.0122										
69	Note: DL/2 is not a recommended method.											
70												
71												
72	Molybdenum, dissolved (cw-1d)											
73												
74	General Statistics											
75	Number of Valid Observations	8									Number of Distinct Observations	8
76												
77	Raw Statistics										Log-transformed Statistics	
78	Minimum	0.012									Minimum of Log Data	-4.423
79	Maximum	0.0518									Maximum of Log Data	-2.96
80	Mean	0.0303									Mean of log Data	-3.623
81	Median	0.03									SD of log Data	0.556
82	SD	0.0151										
83	Coefficient of Variation	0.5										
84	Skewness	0.301										
85												
86												
87	Warning: There are only 8 Values in this data											
88	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
89	the resulting calculations may not be reliable enough to draw conclusions											
90												
91	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
92												
93	Relevant UCL Statistics											
94	Normal Distribution Test										Lognormal Distribution Test	
95	Shapiro Wilk Test Statistic	0.923									Shapiro Wilk Test Statistic	0.918
96	Shapiro Wilk Critical Value	0.818									Shapiro Wilk Critical Value	0.818
97	Data appear Normal at 5% Significance Level										Data appear Lognormal at 5% Significance Level	
98												
99	Assuming Normal Distribution										Assuming Lognormal Distribution	
100	95% Student's-t UCL	0.0404									95% H-UCL	0.0522
101	95% UCLs (Adjusted for Skewness)										95% Chebyshev (MVUE) UCL	0.057
102	95% Adjusted-CLT UCL	0.0397									97.5% Chebyshev (MVUE) UCL	0.0684
103	95% Modified-t UCL	0.0405									99% Chebyshev (MVUE) UCL	0.0909
104												
105	Gamma Distribution Test										Data Distribution	
106	k star (bias corrected)	2.682									Data appear Normal at 5% Significance Level	

107					Theta Star	0.0113						
108					nu star	42.9						
109					Approximate Chi Square Value (.05)	28.89				**Nonparametric Statistics**		
110					Adjusted Level of Significance	0.0195					95% CLT UCL	0.0391
111					Adjusted Chi Square Value	26.01					95% Jackknife UCL	0.0404
112											95% Standard Bootstrap UCL	0.0382
113					Anderson-Darling Test Statistic	0.29					95% Bootstrap-t UCL	0.0421
114					Anderson-Darling 5% Critical Value	0.719					95% Hall's Bootstrap UCL	0.0426
115					Kolmogorov-Smirnov Test Statistic	0.161					95% Percentile Bootstrap UCL	0.0386
116					Kolmogorov-Smirnov 5% Critical Value	0.295					95% BCA Bootstrap UCL	0.0392
117					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0536
118											97.5% Chebyshev(Mean, Sd) UCL	0.0637
119					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0835
120					95% Approximate Gamma UCL	0.0449						
121					95% Adjusted Gamma UCL	0.0499						
122												
123					**Potential UCL to Use**						Use 95% Student's-t UCL	0.0404
124												
125												
126	**Molybdenum, dissolved (cw-1m)**											
127												
128					**General Statistics**							
129					Number of Valid Observations	8					Number of Distinct Observations	7
130												
131					**Raw Statistics**						**Log-transformed Statistics**	
132					Minimum	0.0184					Minimum of Log Data	-3.995
133					Maximum	0.0244					Maximum of Log Data	-3.713
134					Mean	0.0211					Mean of log Data	-3.861
135					Median	0.0209					SD of log Data	0.1
136					SD	0.00215						
137					Coefficient of Variation	0.102						
138					Skewness	0.506						
139												
140												
141					**Warning: There are only 8 Values in this data**							
142					**Note: It should be noted that even though bootstrap methods may be performed on this data set,**							
143					**the resulting calculations may not be reliable enough to draw conclusions**							
144												
145					**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**							
146												
147					**Relevant UCL Statistics**							
148					**Normal Distribution Test**						**Lognormal Distribution Test**	
149					Shapiro Wilk Test Statistic	0.921					Shapiro Wilk Test Statistic	0.931
150					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
151					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
152												
153					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
154					95% Student's-t UCL	0.0226					95% H-UCL	0.0227
155					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0244
156					95% Adjusted-CLT UCL	0.0225					97.5% Chebyshev (MVUE) UCL	0.0258
157					95% Modified-t UCL	0.0226					99% Chebyshev (MVUE) UCL	0.0286
158												
159					**Gamma Distribution Test**						**Data Distribution**	

160					k star (bias corrected)	70.56		**Data appear Normal at 5% Significance Level**				
161					Theta Star	0.0002996						
162					nu star	1129						
163					Approximate Chi Square Value (.05)	1052		**Nonparametric Statistics**				
164					Adjusted Level of Significance	0.0195					95% CLT UCL	0.0224
165					Adjusted Chi Square Value	1033					95% Jackknife UCL	0.0226
166											95% Standard Bootstrap UCL	0.0223
167					Anderson-Darling Test Statistic	0.351					95% Bootstrap-t UCL	0.0228
168					Anderson-Darling 5% Critical Value	0.715					95% Hall's Bootstrap UCL	0.023
169					Kolmogorov-Smirnov Test Statistic	0.191					95% Percentile Bootstrap UCL	0.0223
170					Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	0.0223
171					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0244
172											97.5% Chebyshev(Mean, Sd) UCL	0.0259
173					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0287
174					95% Approximate Gamma UCL	0.0227						
175					95% Adjusted Gamma UCL	0.0231						
176												
177					**Potential UCL to Use**						Use 95% Student's-t UCL	0.0226
178												
179												
180	**Molybdenum, dissolved (cw-2d)**											
181												
182					**General Statistics**							
183					Number of Valid Observations	8					Number of Distinct Observations	8
184												
185					**Raw Statistics**			**Log-transformed Statistics**				
186					Minimum	0.0339					Minimum of Log Data	-3.384
187					Maximum	0.0732					Maximum of Log Data	-2.615
188					Mean	0.0527					Mean of log Data	-2.969
189					Median	0.051					SD of log Data	0.248
190					SD	0.0128						
191					Coefficient of Variation	0.242						
192					Skewness	0.215						
193												
194												
195					**Warning: There are only 8 Values in this data**							
196					**Note: It should be noted that even though bootstrap methods may be performed on this data set,**							
197					**the resulting calculations may not be reliable enough to draw conclusions**							
198												
199					**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**							
200												
201					**Relevant UCL Statistics**							
202					**Normal Distribution Test**			**Lognormal Distribution Test**				
203					Shapiro Wilk Test Statistic	0.987					Shapiro Wilk Test Statistic	0.987
204					Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
205					**Data appear Normal at 5% Significance Level**			**Data appear Lognormal at 5% Significance Level**				
206												
207					**Assuming Normal Distribution**			**Assuming Lognormal Distribution**				
208					95% Student's-t UCL	0.0613					95% H-UCL	0.0639
209					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.073
210					95% Adjusted-CLT UCL	0.0605					97.5% Chebyshev (MVUE) UCL	0.0817
211					95% Modified-t UCL	0.0613					99% Chebyshev (MVUE) UCL	0.0989
212												

213	**Gamma Distribution Test**						**Data Distribution**					
214	k star (bias corrected)				12.05		**Data appear Normal at 5% Significance Level**					
215	Theta Star				0.00438							
216	nu star				192.8							
217	Approximate Chi Square Value (.05)				161.6		**Nonparametric Statistics**					
218	Adjusted Level of Significance				0.0195		95% CLT UCL					0.0602
219	Adjusted Chi Square Value				154.4		95% Jackknife UCL					0.0613
220							95% Standard Bootstrap UCL					0.0596
221	Anderson-Darling Test Statistic				0.139		95% Bootstrap-t UCL					0.0615
222	Anderson-Darling 5% Critical Value				0.716		95% Hall's Bootstrap UCL					0.061
223	Kolmogorov-Smirnov Test Statistic				0.126		95% Percentile Bootstrap UCL					0.0595
224	Kolmogorov-Smirnov 5% Critical Value				0.294		95% BCA Bootstrap UCL					0.0597
225	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.0724
226							97.5% Chebyshev(Mean, Sd) UCL					0.0809
227	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.0976
228	95% Approximate Gamma UCL				0.0629							
229	95% Adjusted Gamma UCL				0.0658							
230												
231	**Potential UCL to Use**						Use 95% Student's-t UCL					0.0613
232												
233												
234	**Molybdenum, dissolved (cw-2m)**											
235												
236	**General Statistics**											
237	Number of Valid Observations				8		Number of Distinct Observations					8
238												
239	**Raw Statistics**						**Log-transformed Statistics**					
240	Minimum				0.0201		Minimum of Log Data					-3.907
241	Maximum				0.0292		Maximum of Log Data					-3.534
242	Mean				0.0244		Mean of log Data					-3.718
243	Median				0.024		SD of log Data					0.113
244	SD				0.00275							
245	Coefficient of Variation				0.113							
246	Skewness				0.305							
247												
248												
249	**Warning: There are only 8 Values in this data**											
250	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
251	**the resulting calculations may not be reliable enough to draw conclusions**											
252												
253	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
254												
255	**Relevant UCL Statistics**											
256	**Normal Distribution Test**						**Lognormal Distribution Test**					
257	Shapiro Wilk Test Statistic				0.974		Shapiro Wilk Test Statistic					0.977
258	Shapiro Wilk Critical Value				0.818		Shapiro Wilk Critical Value					0.818
259	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
260												
261	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
262	95% Student's-t UCL				0.0263		95% H-UCL					0.0265
263	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0287
264	95% Adjusted-CLT UCL				0.0261		97.5% Chebyshev (MVUE) UCL					0.0305
265	95% Modified-t UCL				0.0263		99% Chebyshev (MVUE) UCL					0.0341

266												
267	**Gamma Distribution Test**						**Data Distribution**					
268	k star (bias corrected)				56.58		**Data appear Normal at 5% Significance Level**					
269	Theta Star				0.0004317							
270	nu star				905.3							
271	Approximate Chi Square Value (.05)				836.5		**Nonparametric Statistics**					
272	Adjusted Level of Significance				0.0195		95% CLT UCL					0.026
273	Adjusted Chi Square Value				819.6		95% Jackknife UCL					0.0263
274							95% Standard Bootstrap UCL					0.0259
275	Anderson-Darling Test Statistic				0.212		95% Bootstrap-t UCL					0.0265
276	Anderson-Darling 5% Critical Value				0.715		95% Hall's Bootstrap UCL					0.0265
277	Kolmogorov-Smirnov Test Statistic				0.159		95% Percentile Bootstrap UCL					0.026
278	Kolmogorov-Smirnov 5% Critical Value				0.294		95% BCA Bootstrap UCL					0.026
279	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.0287
280							97.5% Chebyshev(Mean, Sd) UCL					0.0305
281	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.0341
282	95% Approximate Gamma UCL				0.0264							
283	95% Adjusted Gamma UCL				0.027							
284												
285	**Potential UCL to Use**						Use 95% Student's-t UCL					0.0263
286												
287												
288	**Molybdenum, dissolved (cw-3d)**											
289												
290	**General Statistics**											
291	Number of Valid Observations				8		Number of Distinct Observations					8
292												
293	**Raw Statistics**						**Log-transformed Statistics**					
294	Minimum				0.0292		Minimum of Log Data					-3.534
295	Maximum				0.0882		Maximum of Log Data					-2.428
296	Mean				0.0522		Mean of log Data					-3.016
297	Median				0.0555		SD of log Data					0.384
298	SD				0.0196							
299	Coefficient of Variation				0.375							
300	Skewness				0.575							
301												
302												
303	**Warning: There are only 8 Values in this data**											
304	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
305	**the resulting calculations may not be reliable enough to draw conclusions**											
306												
307	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
308												
309	**Relevant UCL Statistics**											
310	**Normal Distribution Test**						**Lognormal Distribution Test**					
311	Shapiro Wilk Test Statistic				0.914		Shapiro Wilk Test Statistic					0.919
312	Shapiro Wilk Critical Value				0.818		Shapiro Wilk Critical Value					0.818
313	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
314												
315	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
316	95% Student's-t UCL				0.0653		95% H-UCL					0.0723
317	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0834
318	95% Adjusted-CLT UCL				0.065		97.5% Chebyshev (MVUE) UCL					0.0968

319				95% Modified-t UCL	0.0655					99% Chebyshev (MVUE) UCL	0.123	
320												
321				**Gamma Distribution Test**						**Data Distribution**		
322				k star (bias corrected)	5.141					**Data appear Normal at 5% Significance Level**		
323				Theta Star	0.0101							
324				nu star	82.25							
325				Approximate Chi Square Value (.05)	62.35					**Nonparametric Statistics**		
326				Adjusted Level of Significance	0.0195					95% CLT UCL	0.0635	
327				Adjusted Chi Square Value	57.99					95% Jackknife UCL	0.0653	
328										95% Standard Bootstrap UCL	0.0628	
329				Anderson-Darling Test Statistic	0.381					95% Bootstrap-t UCL	0.0669	
330				Anderson-Darling 5% Critical Value	0.717					95% Hall's Bootstrap UCL	0.0671	
331				Kolmogorov-Smirnov Test Statistic	0.182					95% Percentile Bootstrap UCL	0.0631	
332				Kolmogorov-Smirnov 5% Critical Value	0.295					95% BCA Bootstrap UCL	0.0647	
333				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0823	
334										97.5% Chebyshev(Mean, Sd) UCL	0.0954	
335				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.121	
336				95% Approximate Gamma UCL	0.0688							
337				95% Adjusted Gamma UCL	0.074							
338												
339				**Potential UCL to Use**						Use 95% Student's-t UCL	0.0653	
340												
341												
342	**Molybdenum, dissolved (cw-3m)**											
343												
344				**General Statistics**								
345				Number of Valid Observations	8					Number of Distinct Observations	8	
346												
347				**Raw Statistics**						**Log-transformed Statistics**		
348				Minimum	0.0154					Minimum of Log Data	-4.173	
349				Maximum	0.0378					Maximum of Log Data	-3.275	
350				Mean	0.0248					Mean of log Data	-3.736	
351				Median	0.0225					SD of log Data	0.289	
352				SD	0.00748							
353				Coefficient of Variation	0.302							
354				Skewness	0.938							
355												
356												
357				**Warning: There are only 8 Values in this data**								
358				**Note: It should be noted that even though bootstrap methods may be performed on this data set,**								
359				**the resulting calculations may not be reliable enough to draw conclusions**								
360												
361				**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**								
362												
363				**Relevant UCL Statistics**								
364				**Normal Distribution Test**						**Lognormal Distribution Test**		
365				Shapiro Wilk Test Statistic	0.883					Shapiro Wilk Test Statistic	0.93	
366				Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818	
367				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
368												
369				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
370				95% Student's-t UCL	0.0298					95% H-UCL	0.0311	
371				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0358	

372				95% Adjusted-CLT UCL	0.0301					97.5% Chebyshev (MVUE) UCL	0.0406	
373				95% Modified-t UCL	0.0299					99% Chebyshev (MVUE) UCL	0.05	
374												
375				**Gamma Distribution Test**						**Data Distribution**		
376				k star (bias corrected)	8.524					**Data appear Normal at 5% Significance Level**		
377				Theta Star	0.00291							
378				nu star	136.4							
379				Approximate Chi Square Value (.05)	110.4					**Nonparametric Statistics**		
380				Adjusted Level of Significance	0.0195					95% CLT UCL	0.0291	
381				Adjusted Chi Square Value	104.5					95% Jackknife UCL	0.0298	
382										95% Standard Bootstrap UCL	0.0289	
383				Anderson-Darling Test Statistic	0.449					95% Bootstrap-t UCL	0.0348	
384				Anderson-Darling 5% Critical Value	0.715					95% Hall's Bootstrap UCL	0.0703	
385				Kolmogorov-Smirnov Test Statistic	0.247					95% Percentile Bootstrap UCL	0.0288	
386				Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	0.0296	
387				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0363	
388										97.5% Chebyshev(Mean, Sd) UCL	0.0413	
389				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0511	
390				95% Approximate Gamma UCL	0.0306							
391				95% Adjusted Gamma UCL	0.0323							
392												
393				**Potential UCL to Use**						Use 95% Student's-t UCL	0.0298	
394												
395												
396	**Molybdenum, dissolved (cw-4d)**											
397												
398				**General Statistics**								
399				Number of Valid Observations	8					Number of Distinct Observations	7	
400												
401				**Raw Statistics**						**Log-transformed Statistics**		
402				Minimum	0.0218					Minimum of Log Data	-3.826	
403				Maximum	0.0442					Maximum of Log Data	-3.119	
404				Mean	0.0365					Mean of log Data	-3.338	
405				Median	0.0391					SD of log Data	0.261	
406				SD	0.00833							
407				Coefficient of Variation	0.228							
408				Skewness	-1.076							
409												
410												
411				**Warning: There are only 8 Values in this data**								
412				**Note: It should be noted that even though bootstrap methods may be performed on this data set,**								
413				**the resulting calculations may not be reliable enough to draw conclusions**								
414												
415				**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**								
416												
417				**Relevant UCL Statistics**								
418				**Normal Distribution Test**						**Lognormal Distribution Test**		
419				Shapiro Wilk Test Statistic	0.848					Shapiro Wilk Test Statistic	0.812	
420				Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818	
421				**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
422												
423				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
424				95% Student's-t UCL	0.0421					95% H-UCL	0.0448	

425	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.0513
426				95% Adjusted-CLT UCL	0.0401					97.5% Chebyshev (MVUE) UCL	0.0577
427				95% Modified-t UCL	0.0419					99% Chebyshev (MVUE) UCL	0.0703
428											
429	**Gamma Distribution Test**									**Data Distribution**	
430				k star (bias corrected)	11.66					**Data appear Normal at 5% Significance Level**	
431				Theta Star	0.00313						
432				nu star	186.6						
433				Approximate Chi Square Value (.05)	156					**Nonparametric Statistics**	
434				Adjusted Level of Significance	0.0195					95% CLT UCL	0.0413
435				Adjusted Chi Square Value	148.9					95% Jackknife UCL	0.0421
436										95% Standard Bootstrap UCL	0.0411
437				Anderson-Darling Test Statistic	0.708					95% Bootstrap-t UCL	0.041
438				Anderson-Darling 5% Critical Value	0.716					95% Hall's Bootstrap UCL	0.0399
439				Kolmogorov-Smirnov Test Statistic	0.272					95% Percentile Bootstrap UCL	0.0409
440				Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	0.0403
441	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.0493
442										97.5% Chebyshev(Mean, Sd) UCL	0.0549
443	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.0658
444				95% Approximate Gamma UCL	0.0437						
445				95% Adjusted Gamma UCL	0.0457						
446											
447	**Potential UCL to Use**									Use 95% Student's-t UCL	0.0421
448											
449											
450	**Molybdenum, dissolved (cw-4m)**										
451											
452	**General Statistics**										
453				Number of Valid Observations	8					Number of Distinct Observations	7
454											
455	**Raw Statistics**									**Log-transformed Statistics**	
456				Minimum	0.0073					Minimum of Log Data	-4.92
457				Maximum	0.031					Maximum of Log Data	-3.474
458				Mean	0.0142					Mean of log Data	-4.336
459				Median	0.0122					SD of log Data	0.41
460				SD	0.00718						
461				Coefficient of Variation	0.504						
462				Skewness	2.23						
463											
464											
465	**Warning: There are only 8 Values in this data**										
466	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**										
467	**the resulting calculations may not be reliable enough to draw conclusions**										
468											
469	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**										
470											
471	**Relevant UCL Statistics**										
472	**Normal Distribution Test**									**Lognormal Distribution Test**	
473				Shapiro Wilk Test Statistic	0.709					Shapiro Wilk Test Statistic	0.846
474				Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
475	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**	
476											
477	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	

478				95% Student's-t UCL	0.019					95% H-UCL	0.0201
479				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.023
480				95% Adjusted-CLT UCL	0.0205					97.5% Chebyshev (MVUE) UCL	0.0269
481				95% Modified-t UCL	0.0194					99% Chebyshev (MVUE) UCL	0.0345
482											
483				**Gamma Distribution Test**						**Data Distribution**	
484				k star (bias corrected)	3.938					**Data appear Lognormal at 5% Significance Level**	
485				Theta Star	0.00361						
486				nu star	63.01						
487				Approximate Chi Square Value (.05)	45.75					**Nonparametric Statistics**	
488				Adjusted Level of Significance	0.0195					95% CLT UCL	0.0184
489				Adjusted Chi Square Value	42.06					95% Jackknife UCL	0.019
490										95% Standard Bootstrap UCL	0.0181
491				Anderson-Darling Test Statistic	0.859					95% Bootstrap-t UCL	0.027
492				Anderson-Darling 5% Critical Value	0.718					95% Hall's Bootstrap UCL	0.0451
493				Kolmogorov-Smirnov Test Statistic	0.336					95% Percentile Bootstrap UCL	0.0185
494				Kolmogorov-Smirnov 5% Critical Value	0.295					95% BCA Bootstrap UCL	0.0208
495				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0253
496										97.5% Chebyshev(Mean, Sd) UCL	0.0301
497				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0395
498				95% Approximate Gamma UCL	0.0196						
499				95% Adjusted Gamma UCL	0.0213						
500											
501				**Potential UCL to Use**						Use 95% Student's-t UCL	0.019
502										or 95% Modified-t UCL	0.0194
503										or 95% H-UCL	0.0201
504											
505											
506	**Molybdenum, dissolved (mw-1)**										
507											
508				**General Statistics**							
509				Number of Valid Data	12					Number of Detected Data	3
510				Number of Distinct Detected Data	3					Number of Non-Detect Data	9
511										Percent Non-Detects	75.00%
512											
513				**Raw Statistics**						**Log-transformed Statistics**	
514				Minimum Detected	0.0057					Minimum Detected	-5.167
515				Maximum Detected	0.078					Maximum Detected	-2.551
516				Mean of Detected	0.0299					Mean of Detected	-4.284
517				SD of Detected	0.0417					SD of Detected	1.501
518				Minimum Non-Detect	0.002					Minimum Non-Detect	-6.215
519				Maximum Non-Detect	0.05					Maximum Non-Detect	-2.996
520											
521	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	11
522	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1
523	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	91.67%
524											
525	**Warning: There are only 3 Distinct Detected Values in this data set**										
526	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**										
527	**Those methods will return a 'N/A' value on your output display!**										
528											
529	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**										
530	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**										

531												
532												
533	**UCL Statistics**											
534	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
535				Shapiro Wilk Test Statistic	0.752					Shapiro Wilk Test Statistic	0.76	
536				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
537	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
538												
539	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
540				DL/2 Substitution Method						DL/2 Substitution Method		
541				Mean	0.011					Mean	-5.525	
542				SD	0.0221					SD	1.266	
543				95% DL/2 (t) UCL	0.0224					95% H-Stat (DL/2) UCL	0.0159	
544												
545				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
546	**MLE method failed to converge properly**									Mean in Log Scale	-7.893	
547										SD in Log Scale	2.619	
548										Mean in Original Scale	0.00765	
549										SD in Original Scale	0.0223	
550										95% Percentile Bootstrap UCL	0.0202	
551										95% BCA Bootstrap UCL	0.0271	
552												
553	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
554				k star (bias corrected)	N/A		**Data do not follow a Discernable Distribution (0.05)**					
555				Theta Star	N/A							
556				nu star	N/A							
557												
558				A-D Test Statistic	0.6		**Nonparametric Statistics**					
559				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
560				K-S Test Statistic	N/A					Mean	0.0117	
561				5% K-S Critical Value	N/A					SD	0.02	
562	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00706	
563										95% KM (t) UCL	0.0244	
564	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0234	
565				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0224	
566				Minimum	N/A					95% KM (bootstrap t) UCL	1.77	
567				Maximum	N/A					95% KM (BCA) UCL	0.078	
568				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.078	
569				Median	N/A					95% KM (Chebyshev) UCL	0.0425	
570				SD	N/A					97.5% KM (Chebyshev) UCL	0.0559	
571				k star	N/A					99% KM (Chebyshev) UCL	0.082	
572				Theta star	N/A							
573				Nu star	N/A		**Potential UCLs to Use**					
574				AppChi2	N/A					97.5% KM (Chebyshev) UCL	0.0559	
575				95% Gamma Approximate UCL	N/A							
576				95% Adjusted Gamma UCL	N/A							
577	**Note: DL/2 is not a recommended method.**											
578												
579												
580	**Molybdenum, dissolved (mw-10)**											
581												
582	**General Statistics**											
583				Number of Valid Observations	17					Number of Distinct Observations	16	

584												
585	**Raw Statistics**						**Log-transformed Statistics**					
586					Minimum	0.0683					Minimum of Log Data	-2.684
587					Maximum	0.301					Maximum of Log Data	-1.201
588					Mean	0.14					Mean of log Data	-2.045
589					Median	0.122					SD of log Data	0.391
590					SD	0.0607						
591					Coefficient of Variation	0.435						
592					Skewness	1.462						
593												
594	**Relevant UCL Statistics**											
595	**Normal Distribution Test**						**Lognormal Distribution Test**					
596					Shapiro Wilk Test Statistic	0.87					Shapiro Wilk Test Statistic	0.971
597					Shapiro Wilk Critical Value	0.892					Shapiro Wilk Critical Value	0.892
598	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
599												
600	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
601					95% Student's-t UCL	0.165					95% H-UCL	0.169
602	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.198
603					95% Adjusted-CLT UCL	0.169					97.5% Chebyshev (MVUE) UCL	0.223
604					95% Modified-t UCL	0.166					99% Chebyshev (MVUE) UCL	0.273
605												
606	**Gamma Distribution Test**						**Data Distribution**					
607					k star (bias corrected)	5.579	**Data appear Gamma Distributed at 5% Significance Level**					
608					Theta Star	0.025						
609					nu star	189.7						
610					Approximate Chi Square Value (.05)	158.8	**Nonparametric Statistics**					
611					Adjusted Level of Significance	0.0346					95% CLT UCL	0.164
612					Adjusted Chi Square Value	155.9					95% Jackknife UCL	0.165
613											95% Standard Bootstrap UCL	0.164
614					Anderson-Darling Test Statistic	0.374					95% Bootstrap-t UCL	0.177
615					Anderson-Darling 5% Critical Value	0.741					95% Hall's Bootstrap UCL	0.193
616					Kolmogorov-Smirnov Test Statistic	0.168					95% Percentile Bootstrap UCL	0.165
617					Kolmogorov-Smirnov 5% Critical Value	0.209					95% BCA Bootstrap UCL	0.171
618	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.204
619											97.5% Chebyshev(Mean, Sd) UCL	0.231
620	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.286
621					95% Approximate Gamma UCL	0.167						
622					95% Adjusted Gamma UCL	0.17						
623												
624	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	0.167
625												
626												
627	**Molybdenum, dissolved (mw-11)**											
628												
629	**General Statistics**											
630					Number of Valid Observations	13					Number of Distinct Observations	12
631												
632	**Raw Statistics**						**Log-transformed Statistics**					
633					Minimum	0.0072					Minimum of Log Data	-4.934
634					Maximum	0.035					Maximum of Log Data	-3.352
635					Mean	0.0117					Mean of log Data	-4.553
636					Median	0.00928					SD of log Data	0.41

637					SD	0.00736						
638					Coefficient of Variation	0.63						
639					Skewness	3.099						
640												
641	**Relevant UCL Statistics**											
642	**Normal Distribution Test**						**Lognormal Distribution Test**					
643					Shapiro Wilk Test Statistic	0.532					Shapiro Wilk Test Statistic	0.685
644					Shapiro Wilk Critical Value	0.866					Shapiro Wilk Critical Value	0.866
645	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
646												
647	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
648					95% Student's-t UCL	0.0153					95% H-UCL	0.0145
649	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0171
650					95% Adjusted-CLT UCL	0.0169					97.5% Chebyshev (MVUE) UCL	0.0196
651					95% Modified-t UCL	0.0156					99% Chebyshev (MVUE) UCL	0.0245
652												
653	**Gamma Distribution Test**						**Data Distribution**					
654					k star (bias corrected)	3.903	**Data do not follow a Discernable Distribution (0.05)**					
655					Theta Star	0.00299						
656					nu star	101.5						
657					Approximate Chi Square Value (.05)	79.24	**Nonparametric Statistics**					
658					Adjusted Level of Significance	0.0301					95% CLT UCL	0.015
659					Adjusted Chi Square Value	76.44					95% Jackknife UCL	0.0153
660											95% Standard Bootstrap UCL	0.0149
661					Anderson-Darling Test Statistic	2.04					95% Bootstrap-t UCL	0.0319
662					Anderson-Darling 5% Critical Value	0.736					95% Hall's Bootstrap UCL	0.0304
663					Kolmogorov-Smirnov Test Statistic	0.343					95% Percentile Bootstrap UCL	0.0152
664					Kolmogorov-Smirnov 5% Critical Value	0.237					95% BCA Bootstrap UCL	0.0176
665	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.0206
666											97.5% Chebyshev(Mean, Sd) UCL	0.0244
667	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.032
668					95% Approximate Gamma UCL	0.015						
669					95% Adjusted Gamma UCL	0.0155						
670												
671	**Potential UCL to Use**										Use 95% Student's-t UCL	0.0153
672											or 95% Modified-t UCL	0.0156
673												
674												
675	**Molybdenum, dissolved (mw-12)**											
676												
677	**General Statistics**											
678					Number of Valid Observations	20					Number of Distinct Observations	20
679												
680	**Raw Statistics**						**Log-transformed Statistics**					
681					Minimum	0.019					Minimum of Log Data	-3.963
682					Maximum	0.087					Maximum of Log Data	-2.442
683					Mean	0.0461					Mean of log Data	-3.185
684					Median	0.041					SD of log Data	0.491
685					SD	0.0212						
686					Coefficient of Variation	0.459						
687					Skewness	0.413						
688												
689	**Relevant UCL Statistics**											

690	**Normal Distribution Test**						**Lognormal Distribution Test**					
691				Shapiro Wilk Test Statistic	0.939						Shapiro Wilk Test Statistic	0.942
692				Shapiro Wilk Critical Value	0.905						Shapiro Wilk Critical Value	0.905
693	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
694												
695	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
696				95% Student's-t UCL	0.0543						95% H-UCL	0.0584
697	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0693
698				95% Adjusted-CLT UCL	0.0544						97.5% Chebyshev (MVUE) UCL	0.0793
699				95% Modified-t UCL	0.0544						99% Chebyshev (MVUE) UCL	0.0988
700												
701	**Gamma Distribution Test**						**Data Distribution**					
702				k star (bias corrected)	4.084		**Data appear Normal at 5% Significance Level**					
703				Theta Star	0.0113							
704				nu star	163.4							
705				Approximate Chi Square Value (.05)	134.8		**Nonparametric Statistics**					
706				Adjusted Level of Significance	0.038						95% CLT UCL	0.0539
707				Adjusted Chi Square Value	132.8						95% Jackknife UCL	0.0543
708											95% Standard Bootstrap UCL	0.0537
709				Anderson-Darling Test Statistic	0.315						95% Bootstrap-t UCL	0.0551
710				Anderson-Darling 5% Critical Value	0.745						95% Hall's Bootstrap UCL	0.0536
711				Kolmogorov-Smirnov Test Statistic	0.105						95% Percentile Bootstrap UCL	0.0537
712				Kolmogorov-Smirnov 5% Critical Value	0.195						95% BCA Bootstrap UCL	0.0545
713	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.0667
714											97.5% Chebyshev(Mean, Sd) UCL	0.0757
715	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.0932
716				95% Approximate Gamma UCL	0.0559							
717				95% Adjusted Gamma UCL	0.0567							
718												
719	**Potential UCL to Use**										Use 95% Student's-t UCL	0.0543
720												
721												
722	**Molybdenum, dissolved (mw-13)**											
723												
724	**General Statistics**											
725				Number of Valid Observations	5						Number of Distinct Observations	5
726												
727	**Raw Statistics**						**Log-transformed Statistics**					
728				Minimum	0.0069						Minimum of Log Data	-4.976
729				Maximum	0.02						Maximum of Log Data	-3.912
730				Mean	0.0104						Mean of log Data	-4.657
731				Median	0.0085						SD of log Data	0.432
732				SD	0.00547							
733				Coefficient of Variation	0.529							
734				Skewness	2.08							
735												
736												
737	**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
738												
739	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
740	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
741												
742												

743	Warning: There are only 5 Values in this data											
744	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
745	the resulting calculations may not be reliable enough to draw conclusions											
746												
747	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
748												
749	Relevant UCL Statistics											
750	Normal Distribution Test						Lognormal Distribution Test					
751				Shapiro Wilk Test Statistic	0.703					Shapiro Wilk Test Statistic	0.784	
752				Shapiro Wilk Critical Value	0.762					Shapiro Wilk Critical Value	0.762	
753	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
754												
755	Assuming Normal Distribution						Assuming Lognormal Distribution					
756				95% Student's-t UCL	0.0156					95% H-UCL	0.0189	
757	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL	0.0188	
758				95% Adjusted-CLT UCL	0.0168					97.5% Chebyshev (MVUE) UCL	0.0225	
759				95% Modified-t UCL	0.0159					99% Chebyshev (MVUE) UCL	0.0298	
760												
761	Gamma Distribution Test						Data Distribution					
762				k star (bias corrected)	2.525		Data appear Lognormal at 5% Significance Level					
763				Theta Star	0.0041							
764				nu star	25.25							
765				Approximate Chi Square Value (.05)	14.8		Nonparametric Statistics					
766				Adjusted Level of Significance	0.0086					95% CLT UCL	0.0144	
767				Adjusted Chi Square Value	11.46					95% Jackknife UCL	0.0156	
768										95% Standard Bootstrap UCL	0.014	
769				Anderson-Darling Test Statistic	0.714					95% Bootstrap-t UCL	0.0306	
770				Anderson-Darling 5% Critical Value	0.68					95% Hall's Bootstrap UCL	0.0357	
771				Kolmogorov-Smirnov Test Statistic	0.362					95% Percentile Bootstrap UCL	0.0148	
772				Kolmogorov-Smirnov 5% Critical Value	0.358					95% BCA Bootstrap UCL	0.0154	
773	Data not Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL	0.021	
774										97.5% Chebyshev(Mean, Sd) UCL	0.0256	
775	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL	0.0347	
776				95% Approximate Gamma UCL	0.0177							
777				95% Adjusted Gamma UCL	0.0228							
778												
779	Potential UCL to Use									Use 95% Student's-t UCL	0.0156	
780										or 95% Modified-t UCL	0.0159	
781										or 95% H-UCL	0.0189	
782												
783												
784	Molybdenum, dissolved (mw-14)											
785												
786	General Statistics											
787				Number of Valid Data	6					Number of Detected Data	5	
788				Number of Distinct Detected Data	5					Number of Non-Detect Data	1	
789										Percent Non-Detects	16.67%	
790												
791	Raw Statistics						Log-transformed Statistics					
792				Minimum Detected	0.0067					Minimum Detected	-5.006	
793				Maximum Detected	0.025					Maximum Detected	-3.689	
794				Mean of Detected	0.0124					Mean of Detected	-4.502	
795				SD of Detected	0.00731					SD of Detected	0.506	

796				Minimum Non-Detect	0.0208					Minimum Non-Detect	-3.873	
797				Maximum Non-Detect	0.0208					Maximum Non-Detect	-3.873	
798												
799												
800				Warning: There are only 5 Detected Values in this data								
801				Note: It should be noted that even though bootstrap may be performed on this data set								
802				the resulting calculations may not be reliable enough tp draw conclusions								
803												
804				It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.								
805												
806												
807				UCL Statistics								
808				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
809				Shapiro Wilk Test Statistic	0.794					Shapiro Wilk Test Statistic	0.909	
810				5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762	
811				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
812												
813				Assuming Normal Distribution						Assuming Lognormal Distribution		
814				DL/2 Substitution Method						DL/2 Substitution Method		
815				Mean	0.0121					Mean	-4.512	
816				SD	0.00659					SD	0.453	
817				95% DL/2 (t) UCL	0.0175					95% H-Stat (DL/2) UCL	0.029	
818												
819				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
820				MLE method failed to converge properly						Mean in Log Scale	-4.529	
821										SD in Log Scale	0.457	
822										Mean in Original Scale	0.0119	
823										SD in Original Scale	0.00665	
824										95% Percentile Bootstrap UCL	0.0165	
825										95% BCA Bootstrap UCL	0.0178	
826												
827				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
828				k star (bias corrected)	1.966					Data appear Normal at 5% Significance Level		
829				Theta Star	0.00632							
830				nu star	19.66							
831												
832				A-D Test Statistic	0.434					Nonparametric Statistics		
833				5% A-D Critical Value	0.681					Kaplan-Meier (KM) Method		
834				K-S Test Statistic	0.681					Mean	0.0119	
835				5% K-S Critical Value	0.358					SD	0.00614	
836				Data appear Gamma Distributed at 5% Significance Level						SE of Mean	0.00283	
837										95% KM (t) UCL	0.0176	
838				Assuming Gamma Distribution						95% KM (z) UCL	0.0166	
839				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0175	
840				Minimum	0.0067					95% KM (bootstrap t) UCL	0.0234	
841				Maximum	0.025					95% KM (BCA) UCL	0.0168	
842				Mean	0.0124					95% KM (Percentile Bootstrap) UCL	0.0169	
843				Median	0.0112					95% KM (Chebyshev) UCL	0.0242	
844				SD	0.00654					97.5% KM (Chebyshev) UCL	0.0296	
845				k star	2.844					99% KM (Chebyshev) UCL	0.0401	
846				Theta star	0.00438							
847				Nu star	34.12					Potential UCLs to Use		
848				AppChi2	21.76					95% KM (t) UCL	0.0176	

849			95% Gamma Approximate UCL			0.0195			95% KM (Percentile Bootstrap) UCL			0.0169
850			95% Adjusted Gamma UCL			0.0232						
851	Note: DL/2 is not a recommended method.											
852												
853												
854	Molybdenum, dissolved (mw-15)											
855												
856	General Statistics											
857			Number of Valid Observations		4				Number of Distinct Observations			4
858												
859												
860	Warning: This data set only has 4 observations!											
861	Data set is too small to compute reliable and meaningful statistics and estimates!											
862	The data set for variable Molybdenum, dissolved (mw-15) was not processed!											
863												
864	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
865	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
866												
867												
868												
869	Molybdenum, dissolved (mw-19)											
870												
871	General Statistics											
872			Number of Valid Observations		3				Number of Distinct Observations			3
873												
874												
875	Warning: This data set only has 3 observations!											
876	Data set is too small to compute reliable and meaningful statistics and estimates!											
877	The data set for variable Molybdenum, dissolved (mw-19) was not processed!											
878												
879	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
880	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
881												
882												
883												
884	Molybdenum, dissolved (mw-20-100)											
885												
886	General Statistics											
887			Number of Valid Data		4				Number of Detected Data			3
888			Number of Distinct Detected Data		3				Number of Non-Detect Data			1
889									Percent Non-Detects			25.00%
890												
891	Warning: This data set only has 4 observations!											
892	Data set is too small to compute reliable and meaningful statistics and estimates!											
893	The data set for variable Molybdenum, dissolved (mw-20-100) was not processed!											
894												
895	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
896	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
897												
898												
899												
900	Molybdenum, dissolved (mw-20-130)											
901												

902	**General Statistics**											
903	Number of Valid Observations				15	Number of Distinct Observations						14
904												
905	**Raw Statistics**					**Log-transformed Statistics**						
906	Minimum				0.018	Minimum of Log Data						-4.017
907	Maximum				0.0576	Maximum of Log Data						-2.854
908	Mean				0.0435	Mean of log Data						-3.165
909	Median				0.0455	SD of log Data						0.277
910	SD				0.0094							
911	Coefficient of Variation				0.216							
912	Skewness				-1.501							
913												
914	**Relevant UCL Statistics**											
915	**Normal Distribution Test**					**Lognormal Distribution Test**						
916	Shapiro Wilk Test Statistic				0.859	Shapiro Wilk Test Statistic						0.74
917	Shapiro Wilk Critical Value				0.881	Shapiro Wilk Critical Value						0.881
918	**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**						
919												
920	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
921	95% Student's-t UCL				0.0478	95% H-UCL						0.0503
922	**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL						0.0575
923	95% Adjusted-CLT UCL				0.0465	97.5% Chebyshev (MVUE) UCL						0.0635
924	95% Modified-t UCL				0.0476	99% Chebyshev (MVUE) UCL						0.0752
925												
926	**Gamma Distribution Test**					**Data Distribution**						
927	k star (bias corrected)				13.51	**Data do not follow a Discernable Distribution (0.05)**						
928	Theta Star				0.00322							
929	nu star				405.4							
930	Approximate Chi Square Value (.05)				359.8	**Nonparametric Statistics**						
931	Adjusted Level of Significance				0.0324	95% CLT UCL						0.0475
932	Adjusted Chi Square Value				354.5	95% Jackknife UCL						0.0478
933						95% Standard Bootstrap UCL						0.0473
934	Anderson-Darling Test Statistic				1.277	95% Bootstrap-t UCL						0.0468
935	Anderson-Darling 5% Critical Value				0.736	95% Hall's Bootstrap UCL						0.0467
936	Kolmogorov-Smirnov Test Statistic				0.285	95% Percentile Bootstrap UCL						0.0472
937	Kolmogorov-Smirnov 5% Critical Value				0.221	95% BCA Bootstrap UCL						0.0466
938	**Data not Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL						0.0541
939						97.5% Chebyshev(Mean, Sd) UCL						0.0586
940	**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL						0.0676
941	95% Approximate Gamma UCL				0.049							
942	95% Adjusted Gamma UCL				0.0497							
943												
944	**Potential UCL to Use**					Use 95% Student's-t UCL						0.0478
945						or 95% Modified-t UCL						0.0476
946												
947												
948	**Molybdenum, dissolved (mw-20-70)**											
949												
950	**General Statistics**											
951	Number of Valid Observations				16	Number of Distinct Observations						14
952												
953	**Raw Statistics**					**Log-transformed Statistics**						
954	Minimum				0.0089	Minimum of Log Data						-4.722

955					Maximum	0.0289					Maximum of Log Data	-3.544
956					Mean	0.0206					Mean of log Data	-3.919
957					Median	0.0218					SD of log Data	0.304
958					SD	0.00535						
959					Coefficient of Variation	0.259						
960					Skewness	-0.598						
961												
962	**Relevant UCL Statistics**											
963	**Normal Distribution Test**						**Lognormal Distribution Test**					
964					Shapiro Wilk Test Statistic	0.963					Shapiro Wilk Test Statistic	0.894
965					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
966	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
967												
968	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
969					95% Student's-t UCL	0.023					95% H-UCL	0.0241
970	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0277
971					95% Adjusted-CLT UCL	0.0226					97.5% Chebyshev (MVUE) UCL	0.0307
972					95% Modified-t UCL	0.023					99% Chebyshev (MVUE) UCL	0.0366
973												
974	**Gamma Distribution Test**						**Data Distribution**					
975					k star (bias corrected)	10.72	**Data appear Normal at 5% Significance Level**					
976					Theta Star	0.00192						
977					nu star	343.2						
978					Approximate Chi Square Value (.05)	301.2	**Nonparametric Statistics**					
979					Adjusted Level of Significance	0.0335					95% CLT UCL	0.0228
980					Adjusted Chi Square Value	296.8					95% Jackknife UCL	0.023
981											95% Standard Bootstrap UCL	0.0228
982					Anderson-Darling Test Statistic	0.458					95% Bootstrap-t UCL	0.0228
983					Anderson-Darling 5% Critical Value	0.738					95% Hall's Bootstrap UCL	0.0227
984					Kolmogorov-Smirnov Test Statistic	0.177					95% Percentile Bootstrap UCL	0.0226
985					Kolmogorov-Smirnov 5% Critical Value	0.215					95% BCA Bootstrap UCL	0.0226
986	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.0265
987											97.5% Chebyshev(Mean, Sd) UCL	0.029
988	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.034
989					95% Approximate Gamma UCL	0.0235						
990					95% Adjusted Gamma UCL	0.0239						
991												
992	**Potential UCL to Use**										Use 95% Student's-t UCL	0.023
993												
994												
995	**Molybdenum, dissolved (mw-21)**											
996												
997	**General Statistics**											
998					Number of Valid Data	6					Number of Detected Data	5
999					Number of Distinct Detected Data	5					Number of Non-Detect Data	1
1000											Percent Non-Detects	16.67%
1001												
1002	**Raw Statistics**						**Log-transformed Statistics**					
1003					Minimum Detected	0.0239					Minimum Detected	-3.734
1004					Maximum Detected	0.052					Maximum Detected	-2.957
1005					Mean of Detected	0.0359					Mean of Detected	-3.367
1006					SD of Detected	0.0114					SD of Detected	0.321
1007					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298

1008				Maximum Non-Detect		0.005					Maximum Non-Detect	-5.298
1009												
1010												
1011	**Warning: There are only 5 Detected Values in this data**											
1012	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1013	**the resulting calculations may not be reliable enough tp draw conclusions**											
1014												
1015	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1016												
1017												
1018	**UCL Statistics**											
1019	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1020	Shapiro Wilk Test Statistic					0.927	Shapiro Wilk Test Statistic					0.926
1021	5% Shapiro Wilk Critical Value					0.762	5% Shapiro Wilk Critical Value					0.762
1022	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1023												
1024	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1025	DL/2 Substitution Method						DL/2 Substitution Method					
1026	Mean					0.0304	Mean					-3.804
1027	SD					0.017	SD					1.109
1028	95% DL/2 (t) UCL					0.0444	95% H-Stat (DL/2) UCL					0.148
1029												
1030	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
1031	Mean					0.0295	Mean in Log Scale					-3.503
1032	SD					0.0174	SD in Log Scale					0.441
1033	95% MLE (t) UCL					0.0438	Mean in Original Scale					0.0325
1034	95% MLE (Tiku) UCL					0.0447	SD in Original Scale					0.0133
1035							95% Percentile Bootstrap UCL					0.0409
1036							95% BCA Bootstrap UCL					0.0411
1037												
1038	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1039	k star (bias corrected)					5.092	**Data appear Normal at 5% Significance Level**					
1040	Theta Star					0.00706						
1041	nu star					50.92						
1042												
1043	A-D Test Statistic					0.326	**Nonparametric Statistics**					
1044	5% A-D Critical Value					0.679	Kaplan-Meier (KM) Method					
1045	K-S Test Statistic					0.679	Mean					0.0339
1046	5% K-S Critical Value					0.357	SD					0.0103
1047	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00472
1048							95% KM (t) UCL					0.0434
1049	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0417
1050	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0432
1051	Minimum					0.02	95% KM (bootstrap t) UCL					0.0462
1052	Maximum					0.052	95% KM (BCA) UCL					0.043
1053	Mean					0.0333	95% KM (Percentile Bootstrap) UCL					0.043
1054	Median					0.0321	95% KM (Chebyshev) UCL					0.0545
1055	SD					0.0121	97.5% KM (Chebyshev) UCL					0.0634
1056	k star					4.742	99% KM (Chebyshev) UCL					0.0809
1057	Theta star					0.00702						
1058	Nu star					56.9	**Potential UCLs to Use**					
1059	AppChi2					40.56	95% KM (t) UCL					0.0434
1060	95% Gamma Approximate UCL					0.0467	95% KM (Percentile Bootstrap) UCL					0.043

1061					95% Adjusted Gamma UCL	0.0531						
1062	**Note: DL/2 is not a recommended method.**											
1063												
1064												
1065	**Molybdenum, dissolved (mw-22)**											
1066												
1067	**General Statistics**											
1068					Number of Valid Data	6				Number of Detected Data		5
1069					Number of Distinct Detected Data	5				Number of Non-Detect Data		1
1070										Percent Non-Detects		16.67%
1071												
1072	**Raw Statistics**						**Log-transformed Statistics**					
1073					Minimum Detected	0.031				Minimum Detected		-3.474
1074					Maximum Detected	0.0562				Maximum Detected		-2.879
1075					Mean of Detected	0.0407				Mean of Detected		-3.231
1076					SD of Detected	0.0111				SD of Detected		0.264
1077					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
1078					Maximum Non-Detect	0.005				Maximum Non-Detect		-5.298
1079												
1080												
1081	**Warning: There are only 5 Detected Values in this data**											
1082	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1083	**the resulting calculations may not be reliable enough tp draw conclusions**											
1084												
1085	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1086												
1087												
1088	**UCL Statistics**											
1089	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1090					Shapiro Wilk Test Statistic	0.876				Shapiro Wilk Test Statistic		0.886
1091					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
1092	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1093												
1094	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1095					DL/2 Substitution Method					DL/2 Substitution Method		
1096					Mean	0.0343				Mean		-3.691
1097					SD	0.0185				SD		1.152
1098					95% DL/2 (t) UCL	0.0495				95% H-Stat (DL/2) UCL		0.174
1099												
1100					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
1101					Mean	0.0407				Mean in Log Scale		-3.343
1102					SD	0.00992				SD in Log Scale		0.362
1103					95% MLE (t) UCL	0.0488				Mean in Original Scale		0.0373
1104					95% MLE (Tiku) UCL	0.0496				SD in Original Scale		0.013
1105										95% Percentile Bootstrap UCL		0.0456
1106										95% BCA Bootstrap UCL		0.0451
1107												
1108	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1109					k star (bias corrected)	7.207	**Data appear Normal at 5% Significance Level**					
1110					Theta Star	0.00564						
1111					nu star	72.07						
1112												
1113					A-D Test Statistic	0.407	**Nonparametric Statistics**					

1114				5% A-D Critical Value	0.679					Kaplan-Meier (KM) Method		
1115				K-S Test Statistic	0.679					Mean		0.0391
1116				5% K-S Critical Value	0.357					SD		0.00975
1117				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		0.00445
1118										95% KM (t) UCL		0.048
1119				**Assuming Gamma Distribution**						95% KM (z) UCL		0.0464
1120				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0478
1121				Minimum	0.0261					95% KM (bootstrap t) UCL		0.0635
1122				Maximum	0.0562					95% KM (BCA) UCL		0.0475
1123				Mean	0.0383					95% KM (Percentile Bootstrap) UCL		0.0463
1124				Median	0.034					95% KM (Chebyshev) UCL		0.0585
1125				SD	0.0116					97.5% KM (Chebyshev) UCL		0.0668
1126				k star	7.109					99% KM (Chebyshev) UCL		0.0833
1127				Theta star	0.00538							
1128				Nu star	85.3					**Potential UCLs to Use**		
1129				AppChi2	65.01					95% KM (t) UCL		0.048
1130				95% Gamma Approximate UCL	0.0502					95% KM (Percentile Bootstrap) UCL		0.0463
1131				95% Adjusted Gamma UCL	0.0556							
1132	**Note: DL/2 is not a recommended method.**											
1133												
1134												
1135	**Molybdenum, dissolved (mw-23)**											
1136												
1137					**General Statistics**							
1138				Number of Valid Data	6					Number of Detected Data		3
1139				Number of Distinct Detected Data	3					Number of Non-Detect Data		3
1140										Percent Non-Detects		50.00%
1141												
1142				**Raw Statistics**						**Log-transformed Statistics**		
1143				Minimum Detected	0.00085					Minimum Detected		-7.07
1144				Maximum Detected	0.015					Maximum Detected		-4.2
1145				Mean of Detected	0.00729					Mean of Detected		-5.461
1146				SD of Detected	0.00716					SD of Detected		1.466
1147				Minimum Non-Detect	0.005					Minimum Non-Detect		-5.298
1148				Maximum Non-Detect	0.005					Maximum Non-Detect		-5.298
1149												
1150												
1151	**Warning: There are only 3 Distinct Detected Values in this data set**											
1152	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1153	**Those methods will return a 'N/A' value on your output display!**											
1154												
1155	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1156	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1157												
1158												
1159					**UCL Statistics**							
1160				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
1161				Shapiro Wilk Test Statistic	0.976					Shapiro Wilk Test Statistic		0.958
1162				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value		0.767
1163				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
1164												
1165				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
1166				DL/2 Substitution Method						DL/2 Substitution Method		

1167					Mean	0.00489					Mean	-5.726
1168					SD	0.00523					SD	0.972
1169					95% DL/2 (t) UCL	0.0092					95% H-Stat (DL/2) UCL	0.0267
1170												
1171					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1172					**MLE method failed to converge properly**						Mean in Log Scale	-6.307
1173											SD in Log Scale	1.412
1174											Mean in Original Scale	0.00413
1175											SD in Original Scale	0.00572
1176											95% Percentile Bootstrap UCL	0.00807
1177											95% BCA Bootstrap UCL	0.00893
1178												
1179					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
1180					k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**	
1181					Theta Star	N/A						
1182					nu star	N/A						
1183												
1184					A-D Test Statistic	0.259					**Nonparametric Statistics**	
1185					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
1186					K-S Test Statistic	N/A					Mean	0.00407
1187					5% K-S Critical Value	N/A					SD	0.00524
1188					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00262
1189											95% KM (t) UCL	0.00935
1190					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00838
1191					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00941
1192					Minimum	N/A					95% KM (bootstrap t) UCL	0.0109
1193					Maximum	N/A					95% KM (BCA) UCL	0.015
1194					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.015
1195					Median	N/A					95% KM (Chebyshev) UCL	0.0155
1196					SD	N/A					97.5% KM (Chebyshev) UCL	0.0204
1197					k star	N/A					99% KM (Chebyshev) UCL	0.0301
1198					Theta star	N/A						
1199					Nu star	N/A					**Potential UCLs to Use**	
1200					AppChi2	N/A					95% KM (t) UCL	0.00935
1201					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.015
1202					95% Adjusted Gamma UCL	N/A						
1203	**Note: DL/2 is not a recommended method.**											
1204												
1205												
1206	**Molybdenum, dissolved (mw-24a)**											
1207												
1208						**General Statistics**							
1209					Number of Valid Observations	5					Number of Distinct Observations	5
1210												
1211					**Raw Statistics**						**Log-transformed Statistics**	
1212					Minimum	0.011					Minimum of Log Data	-4.51
1213					Maximum	0.0397					Maximum of Log Data	-3.226
1214					Mean	0.0233					Mean of log Data	-3.864
1215					Median	0.021					SD of log Data	0.513
1216					SD	0.0116						
1217					Coefficient of Variation	0.497						
1218					Skewness	0.616						
1219												

	A	B	C	D	E	F	G	H	I	J	K	L
1220												
1221	**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
1222												
1223	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
1224	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1225												
1226												
1227	**Warning: There are only 5 Values in this data**											
1228	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
1229	**the resulting calculations may not be reliable enough to draw conclusions**											
1230												
1231	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
1232												
1233	**Relevant UCL Statistics**											
1234	**Normal Distribution Test**						**Lognormal Distribution Test**					
1235	Shapiro Wilk Test Statistic					0.956	Shapiro Wilk Test Statistic					0.981
1236	Shapiro Wilk Critical Value					0.762	Shapiro Wilk Critical Value					0.762
1237	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1238												
1239	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1240	95% Student's-t UCL					0.0343	95% H-UCL					0.0516
1241	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0464
1242	95% Adjusted-CLT UCL					0.0333	97.5% Chebyshev (MVUE) UCL					0.0563
1243	95% Modified-t UCL					0.0345	99% Chebyshev (MVUE) UCL					0.076
1244												
1245	**Gamma Distribution Test**						**Data Distribution**					
1246	k star (bias corrected)					2.143	**Data appear Normal at 5% Significance Level**					
1247	Theta Star					0.0109						
1248	nu star					21.43						
1249	Approximate Chi Square Value (.05)					11.91	**Nonparametric Statistics**					
1250	Adjusted Level of Significance					0.0086	95% CLT UCL					0.0318
1251	Adjusted Chi Square Value					8.97	95% Jackknife UCL					0.0343
1252							95% Standard Bootstrap UCL					0.0307
1253	Anderson-Darling Test Statistic					0.196	95% Bootstrap-t UCL					0.0404
1254	Anderson-Darling 5% Critical Value					0.681	95% Hall's Bootstrap UCL					0.0488
1255	Kolmogorov-Smirnov Test Statistic					0.177	95% Percentile Bootstrap UCL					0.0307
1256	Kolmogorov-Smirnov 5% Critical Value					0.358	95% BCA Bootstrap UCL					0.0319
1257	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.0458
1258							97.5% Chebyshev(Mean, Sd) UCL					0.0555
1259	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.0747
1260	95% Approximate Gamma UCL					0.0418						
1261	95% Adjusted Gamma UCL					0.0556						
1262												
1263	**Potential UCL to Use**						Use 95% Student's-t UCL					0.0343
1264												
1265												
1266	**Molybdenum, dissolved (mw-24b)**											
1267												
1268	**General Statistics**											
1269	Number of Valid Observations					3	Number of Distinct Observations					3
1270												
1271												
1272	**Warning: This data set only has 3 observations!**											

1273	Data set is too small to compute reliable and meaningful statistics and estimates!											
1274	The data set for variable Molybdenum, dissolved (mw-24b) was not processed!											
1275												
1276	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1277	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1278												
1279												
1280												
1281	Molybdenum, dissolved (mw-24br)											
1282												
1283	General Statistics											
1284	Number of Valid Observations	2				Number of Distinct Observations	2					
1285												
1286												
1287	Warning: This data set only has 2 observations!											
1288	Data set is too small to compute reliable and meaningful statistics and estimates!											
1289	The data set for variable Molybdenum, dissolved (mw-24br) was not processed!											
1290												
1291	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1292	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1293												
1294												
1295												
1296	Molybdenum, dissolved (mw-25)											
1297												
1298	General Statistics											
1299	Number of Valid Data	13				Number of Detected Data	9					
1300	Number of Distinct Detected Data	9				Number of Non-Detect Data	4					
1301						Percent Non-Detects	30.77%					
1302												
1303	Raw Statistics					Log-transformed Statistics						
1304	Minimum Detected	0.00334				Minimum Detected	-5.702					
1305	Maximum Detected	0.017				Maximum Detected	-4.075					
1306	Mean of Detected	0.00595				Mean of Detected	-5.308					
1307	SD of Detected	0.00463				SD of Detected	0.582					
1308	Minimum Non-Detect	0.005				Minimum Non-Detect	-5.298					
1309	Maximum Non-Detect	0.01				Maximum Non-Detect	-4.605					
1310												
1311	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect	12					
1312	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected	1					
1313	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage	92.31%					
1314												
1315	Warning: There are only 9 Detected Values in this data											
1316	Note: It should be noted that even though bootstrap may be performed on this data set											
1317	the resulting calculations may not be reliable enough tp draw conclusions											
1318												
1319	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
1320												
1321												
1322	UCL Statistics											
1323	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
1324	Shapiro Wilk Test Statistic	0.655				Shapiro Wilk Test Statistic	0.742					
1325	5% Shapiro Wilk Critical Value	0.829				5% Shapiro Wilk Critical Value	0.829					

	A	B	C	D	E	F	G	H	I	J	K	L
1326	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1327												
1328	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1329	DL/2 Substitution Method						DL/2 Substitution Method					
1330	Mean					0.00508	Mean					-5.465
1331	SD					0.00407	SD					0.562
1332	95% DL/2 (t) UCL					0.00709	95% H-Stat (DL/2) UCL					0.00883
1333												
1334	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1335	**MLE method failed to converge properly**						Mean in Log Scale					-5.383
1336							SD in Log Scale					0.503
1337							Mean in Original Scale					0.00534
1338							SD in Original Scale					0.00393
1339							95% Percentile Bootstrap UCL					0.00719
1340							95% BCA Bootstrap UCL					0.00809
1341												
1342	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1343	k star (bias corrected)					1.995	**Data do not follow a Discernable Distribution (0.05)**					
1344	Theta Star					0.00298						
1345	nu star					35.9						
1346												
1347	A-D Test Statistic					1.221	**Nonparametric Statistics**					
1348	5% A-D Critical Value					0.727	Kaplan-Meier (KM) Method					
1349	K-S Test Statistic					0.727	Mean					0.00527
1350	5% K-S Critical Value					0.281	SD					0.00381
1351	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.00113
1352							95% KM (t) UCL					0.00729
1353	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00713
1354	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00725
1355	Minimum					0.00334	95% KM (bootstrap t) UCL					0.0138
1356	Maximum					0.017	95% KM (BCA) UCL					0.00739
1357	Mean					0.00602	95% KM (Percentile Bootstrap) UCL					0.00725
1358	Median					0.00431	95% KM (Chebyshev) UCL					0.0102
1359	SD					0.00385	97.5% KM (Chebyshev) UCL					0.0123
1360	k star					3.051	99% KM (Chebyshev) UCL					0.0166
1361	Theta star					0.00197						
1362	Nu star					79.34	**Potential UCLs to Use**					
1363	AppChi2					59.82	95% KM (BCA) UCL					0.00739
1364	95% Gamma Approximate UCL					0.00799						
1365	95% Adjusted Gamma UCL					0.00832						
1366	**Note: DL/2 is not a recommended method.**											
1367												
1368												
1369	**Molybdenum, dissolved (mw-26)**											
1370												
1371	**General Statistics**											
1372	Number of Valid Observations					6	Number of Distinct Observations					6
1373												
1374	**Raw Statistics**						**Log-transformed Statistics**					
1375	Minimum					0.0288	Minimum of Log Data					-3.547
1376	Maximum					0.043	Maximum of Log Data					-3.147
1377	Mean					0.0328	Mean of log Data					-3.427
1378	Median					0.031	SD of log Data					0.151

SD	0.00537	
Coefficient of Variation	0.164	
Skewness	1.781	

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.794	Shapiro Wilk Test Statistic	0.828
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0372	95% H-UCL	0.0376
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0416
95% Adjusted-CLT UCL	0.0381	97.5% Chebyshev (MVUE) UCL	0.0454
95% Modified-t UCL	0.0375	99% Chebyshev (MVUE) UCL	0.0529
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	25.03	**Data appear Normal at 5% Significance Level**	
Theta Star	0.00131		
nu star	300.3		
Approximate Chi Square Value (.05)	261.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	0.0364
Adjusted Chi Square Value	247.9	95% Jackknife UCL	0.0372
		95% Standard Bootstrap UCL	0.0361
Anderson-Darling Test Statistic	0.566	95% Bootstrap-t UCL	0.0423
Anderson-Darling 5% Critical Value	0.697	95% Hall's Bootstrap UCL	0.0503
Kolmogorov-Smirnov Test Statistic	0.217	95% Percentile Bootstrap UCL	0.0367
Kolmogorov-Smirnov 5% Critical Value	0.332	95% BCA Bootstrap UCL	0.0375
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0424
		97.5% Chebyshev(Mean, Sd) UCL	0.0465
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0546
95% Approximate Gamma UCL	0.0377		
95% Adjusted Gamma UCL	0.0397		
Potential UCL to Use		Use 95% Student's-t UCL	0.0372

Molybdenum, dissolved (mw-27-20)

General Statistics

1432					Number of Valid Observations	3			Number of Distinct Observations	3		
1433												
1434												
1435							**Warning: This data set only has 3 observations!**					
1436							**Data set is too small to compute reliable and meaningful statistics and estimates!**					
1437							**The data set for variable Molybdenum, dissolved (mw-27-20) was not processed!**					
1438												
1439							**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**					
1440							**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**					
1441												
1442												
1443												
1444	**Molybdenum, dissolved (mw-28-25)**											
1445												
1446							**General Statistics**					
1447					Number of Valid Observations	3			Number of Distinct Observations	3		
1448												
1449												
1450							**Warning: This data set only has 3 observations!**					
1451							**Data set is too small to compute reliable and meaningful statistics and estimates!**					
1452							**The data set for variable Molybdenum, dissolved (mw-28-25) was not processed!**					
1453												
1454							**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**					
1455							**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**					
1456												
1457												
1458												
1459	**Molybdenum, dissolved (mw-29)**											
1460												
1461							**General Statistics**					
1462					Number of Valid Data	3			Number of Detected Data	2		
1463					Number of Distinct Detected Data	2			Number of Non-Detect Data	1		
1464									Percent Non-Detects	33.33%		
1465												
1466							**Warning: This data set only has 3 observations!**					
1467							**Data set is too small to compute reliable and meaningful statistics and estimates!**					
1468							**The data set for variable Molybdenum, dissolved (mw-29) was not processed!**					
1469												
1470							**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**					
1471							**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**					
1472												
1473												
1474												
1475	**Molybdenum, dissolved (mw-3)**											
1476												
1477							**General Statistics**					
1478					Number of Valid Data	12			Number of Detected Data	11		
1479					Number of Distinct Detected Data	9			Number of Non-Detect Data	1		
1480									Percent Non-Detects	8.33%		
1481												
1482					**Raw Statistics**				**Log-transformed Statistics**			
1483					Minimum Detected	0.025			Minimum Detected	-3.689		
1484					Maximum Detected	0.041			Maximum Detected	-3.194		

	A	B	C	D	E	F	G	H	I	J	K	L
1485					Mean of Detected	0.0314					Mean of Detected	-3.471
1486					SD of Detected	0.00509					SD of Detected	0.155
1487					Minimum Non-Detect	0.05					Minimum Non-Detect	-2.996
1488					Maximum Non-Detect	0.05					Maximum Non-Detect	-2.996
1489												
1490												
1491	**UCL Statistics**											
1492	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1493					Shapiro Wilk Test Statistic	0.886					Shapiro Wilk Test Statistic	0.912
1494					5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85
1495	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1496												
1497	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1498					DL/2 Substitution Method						DL/2 Substitution Method	
1499					Mean	0.0309					Mean	-3.489
1500					SD	0.0052					SD	0.161
1501					95% DL/2 (t) UCL	0.0336					95% H-Stat (DL/2) UCL	0.038
1502												
1503					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1504	**MLE method failed to converge properly**										Mean in Log Scale	-3.471
1505											SD in Log Scale	0.148
1506											Mean in Original Scale	0.0314
1507											SD in Original Scale	0.00485
1508											95% Percentile Bootstrap UCL	0.0336
1509											95% BCA Bootstrap UCL	0.0339
1510												
1511	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1512					k star (bias corrected)	32.45	**Data appear Normal at 5% Significance Level**					
1513					Theta Star	0.000969						
1514					nu star	713.9						
1515												
1516					A-D Test Statistic	0.592	**Nonparametric Statistics**					
1517					5% A-D Critical Value	0.728					Kaplan-Meier (KM) Method	
1518					K-S Test Statistic	0.728					Mean	0.0314
1519					5% K-S Critical Value	0.255					SD	0.00485
1520	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00153
1521											95% KM (t) UCL	0.0342
1522	**Assuming Gamma Distribution**										95% KM (z) UCL	0.034
1523					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0342
1524					Minimum	0.025					95% KM (bootstrap t) UCL	0.0351
1525					Maximum	0.041					95% KM (BCA) UCL	0.0341
1526					Mean	0.0315					95% KM (Percentile Bootstrap) UCL	0.0338
1527					Median	0.0297					95% KM (Chebyshev) UCL	0.0381
1528					SD	0.00486					97.5% KM (Chebyshev) UCL	0.041
1529					k star	36.37					99% KM (Chebyshev) UCL	0.0467
1530					Theta star	0.0008667						
1531					Nu star	872.9	**Potential UCLs to Use**					
1532					AppChi2	805.3					95% KM (t) UCL	0.0342
1533					95% Gamma Approximate UCL	0.0342					95% KM (Percentile Bootstrap) UCL	0.0338
1534					95% Adjusted Gamma UCL	0.0346						
1535	**Note: DL/2 is not a recommended method.**											
1536												
1537												

	A	B	C	D	E	F	G	H	I	J	K	L
1538	**Molybdenum, dissolved (mw-30-30)**											
1539												
1540	**General Statistics**											
1541					Number of Valid Data	4			Number of Detected Data			2
1542					Number of Distinct Detected Data	2			Number of Non-Detect Data			2
1543									Percent Non-Detects			50.00%
1544												
1545	**Warning: This data set only has 4 observations!**											
1546	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1547	**The data set for variable Molybdenum, dissolved (mw-30-30) was not processed!**											
1548												
1549	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1550	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1551												
1552												
1553												
1554	**Molybdenum, dissolved (mw-31-135)**											
1555												
1556	**General Statistics**											
1557					Number of Valid Observations	1			Number of Distinct Observations			1
1558												
1559												
1560	**Warning: This data set only has 1 observations!**											
1561	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1562	**The data set for variable Molybdenum, dissolved (mw-31-135) was not processed!**											
1563												
1564	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1565	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1566												
1567												
1568												
1569	**Molybdenum, dissolved (mw-31-60)**											
1570												
1571	**General Statistics**											
1572					Number of Valid Observations	5			Number of Distinct Observations			5
1573												
1574	**Raw Statistics**						**Log-transformed Statistics**					
1575					Minimum	0.0063			Minimum of Log Data			-5.067
1576					Maximum	0.025			Maximum of Log Data			-3.689
1577					Mean	0.0124			Mean of log Data			-4.53
1578					Median	0.0098			SD of log Data			0.581
1579					SD	0.00778						
1580					Coefficient of Variation	0.626						
1581					Skewness	1.369						
1582												
1583												
1584	**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
1585												
1586	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
1587	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1588												
1589												
1590	**Warning: There are only 5 Values in this data**											

	A	B	C	D	E	F	G	H	I	J	K	L
1591	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
1592	the resulting calculations may not be reliable enough to draw conclusions											
1593												
1594	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
1595												
1596	Relevant UCL Statistics											
1597	Normal Distribution Test						Lognormal Distribution Test					
1598					Shapiro Wilk Test Statistic	0.852				Shapiro Wilk Test Statistic	0.913	
1599					Shapiro Wilk Critical Value	0.762				Shapiro Wilk Critical Value	0.762	
1600	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
1601												
1602	Assuming Normal Distribution						Assuming Lognormal Distribution					
1603					95% Student's-t UCL	0.0198				95% H-UCL	0.0325	
1604	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL	0.026	
1605					95% Adjusted-CLT UCL	0.0204				97.5% Chebyshev (MVUE) UCL	0.032	
1606					95% Modified-t UCL	0.0202				99% Chebyshev (MVUE) UCL	0.0437	
1607												
1608	Gamma Distribution Test						Data Distribution					
1609					k star (bias corrected)	1.608	Data appear Normal at 5% Significance Level					
1610					Theta Star	0.00773						
1611					nu star	16.08						
1612					Approximate Chi Square Value (.05)	8.015	Nonparametric Statistics					
1613					Adjusted Level of Significance	0.0086				95% CLT UCL	0.0181	
1614					Adjusted Chi Square Value	5.702				95% Jackknife UCL	0.0198	
1615										95% Standard Bootstrap UCL	0.0177	
1616					Anderson-Darling Test Statistic	0.352				95% Bootstrap-t UCL	0.0318	
1617					Anderson-Darling 5% Critical Value	0.682				95% Hall's Bootstrap UCL	0.0511	
1618					Kolmogorov-Smirnov Test Statistic	0.226				95% Percentile Bootstrap UCL	0.0178	
1619					Kolmogorov-Smirnov 5% Critical Value	0.359				95% BCA Bootstrap UCL	0.0192	
1620	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL	0.0276	
1621										97.5% Chebyshev(Mean, Sd) UCL	0.0341	
1622	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL	0.047	
1623					95% Approximate Gamma UCL	0.0249						
1624					95% Adjusted Gamma UCL	0.035						
1625												
1626	Potential UCL to Use									Use 95% Student's-t UCL	0.0198	
1627												
1628												
1629	Molybdenum, dissolved (mw-32-35)											
1630												
1631	General Statistics											
1632					Number of Valid Observations	3				Number of Distinct Observations	3	
1633												
1634												
1635	Warning: This data set only has 3 observations!											
1636	Data set is too small to compute reliable and meaningful statistics and estimates!											
1637	The data set for variable Molybdenum, dissolved (mw-32-35) was not processed!											
1638												
1639	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1640	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1641												
1642												
1643												

	A	B	C	D	E	F	G	H	I	J	K	L
1644	**Molybdenum, dissolved (mw-33-210)**											
1645												
1646	**General Statistics**											
1647	Number of Valid Observations					1			Number of Distinct Observations			1
1648												
1649												
1650	**Warning: This data set only has 1 observations!**											
1651	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1652	**The data set for variable Molybdenum, dissolved (mw-33-210) was not processed!**											
1653												
1654	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1655	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1656												
1657												
1658												
1659	**Molybdenum, dissolved (mw-33-90)**											
1660												
1661	**General Statistics**											
1662	Number of Valid Observations					1			Number of Distinct Observations			1
1663												
1664												
1665	**Warning: This data set only has 1 observations!**											
1666	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1667	**The data set for variable Molybdenum, dissolved (mw-33-90) was not processed!**											
1668												
1669	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1670	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1671												
1672												
1673												
1674	**Molybdenum, dissolved (mw-34-100)**											
1675												
1676	**General Statistics**											
1677	Number of Valid Observations					2			Number of Distinct Observations			2
1678												
1679												
1680	**Warning: This data set only has 2 observations!**											
1681	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1682	**The data set for variable Molybdenum, dissolved (mw-34-100) was not processed!**											
1683												
1684	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1685	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1686												
1687												
1688												
1689	**Molybdenum, dissolved (mw-34-55)**											
1690												
1691	**General Statistics**											
1692	Number of Valid Observations					9			Number of Distinct Observations			9
1693												
1694	**Raw Statistics**								**Log-transformed Statistics**			
1695	Minimum					0.0124			Minimum of Log Data			-4.39
1696	Maximum					0.0252			Maximum of Log Data			-3.681

1697					Mean	0.0162					Mean of log Data	-4.149
1698					Median	0.0157					SD of log Data	0.235
1699					SD	0.00417						
1700					Coefficient of Variation	0.258						
1701					Skewness	1.412						
1702												
1703												
1704	**Warning: There are only 9 Values in this data**											
1705	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
1706	**the resulting calculations may not be reliable enough to draw conclusions**											
1707												
1708	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
1709												
1710	**Relevant UCL Statistics**											
1711	**Normal Distribution Test**						**Lognormal Distribution Test**					
1712	Shapiro Wilk Test Statistic					0.854	Shapiro Wilk Test Statistic					0.901
1713	Shapiro Wilk Critical Value					0.829	Shapiro Wilk Critical Value					0.829
1714	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1715												
1716	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1717	95% Student's-t UCL					0.0188	95% H-UCL					0.0191
1718	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0217
1719	95% Adjusted-CLT UCL					0.0192	97.5% Chebyshev (MVUE) UCL					0.0241
1720	95% Modified-t UCL					0.0189	99% Chebyshev (MVUE) UCL					0.0288
1721												
1722	**Gamma Distribution Test**						**Data Distribution**					
1723	k star (bias corrected)					12.97	**Data appear Normal at 5% Significance Level**					
1724	Theta Star					0.00125						
1725	nu star					233.4						
1726	Approximate Chi Square Value (.05)					199.1	**Nonparametric Statistics**					
1727	Adjusted Level of Significance					0.0231	95% CLT UCL					0.0185
1728	Adjusted Chi Square Value					192.4	95% Jackknife UCL					0.0188
1729							95% Standard Bootstrap UCL					0.0183
1730	Anderson-Darling Test Statistic					0.447	95% Bootstrap-t UCL					0.0209
1731	Anderson-Darling 5% Critical Value					0.721	95% Hall's Bootstrap UCL					0.0304
1732	Kolmogorov-Smirnov Test Statistic					0.184	95% Percentile Bootstrap UCL					0.0185
1733	Kolmogorov-Smirnov 5% Critical Value					0.279	95% BCA Bootstrap UCL					0.0189
1734	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.0223
1735							97.5% Chebyshev(Mean, Sd) UCL					0.0249
1736	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.03
1737	95% Approximate Gamma UCL					0.019						
1738	95% Adjusted Gamma UCL					0.0197						
1739												
1740	**Potential UCL to Use**						Use 95% Student's-t UCL					0.0188
1741												
1742												
1743	**Molybdenum, dissolved (mw-34-80)**											
1744												
1745	**General Statistics**											
1746	Number of Valid Observations					13	Number of Distinct Observations					10
1747												
1748	**Raw Statistics**						**Log-transformed Statistics**					
1749	Minimum					0.0102	Minimum of Log Data					-4.585

Maximum	0.02	Maximum of Log Data -3.912
Mean	0.0133	Mean of log Data -4.336
Median	0.013	SD of log Data 0.177
SD	0.00254	
Coefficient of Variation	0.191	
Skewness	1.49	

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.872	Shapiro Wilk Test Statistic	0.931
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0145	95% H-UCL	0.0146
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0161
95% Adjusted-CLT UCL	0.0148	97.5% Chebyshev (MVUE) UCL	0.0174
95% Modified-t UCL	0.0146	99% Chebyshev (MVUE) UCL	0.0198
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	25.46	**Data appear Normal at 5% Significance Level**	
Theta Star	0.000522		
nu star	662		
Approximate Chi Square Value (.05)	603.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0301	95% CLT UCL	0.0145
Adjusted Chi Square Value	595.3	95% Jackknife UCL	0.0145
		95% Standard Bootstrap UCL	0.0144
Anderson-Darling Test Statistic	0.404	95% Bootstrap-t UCL	0.015
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	0.0163
Kolmogorov-Smirnov Test Statistic	0.168	95% Percentile Bootstrap UCL	0.0144
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	0.0147
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0164
		97.5% Chebyshev(Mean, Sd) UCL	0.0177
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0203
95% Approximate Gamma UCL	0.0146		
95% Adjusted Gamma UCL	0.0148		
Potential UCL to Use		Use 95% Student's-t UCL	0.0145

Molybdenum, dissolved (mw-35-135)

General Statistics

Number of Valid Observations	2	Number of Distinct Observations	2

Warning: This data set only has 2 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Molybdenum, dissolved (mw-35-135) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

1803												
1804												
1805	**Molybdenum, dissolved (mw-35-60)**											
1806												
1807	**General Statistics**											
1808	Number of Valid Observations				1		Number of Distinct Observations					1
1809												
1810												
1811	**Warning: This data set only has 1 observations!**											
1812	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1813	**The data set for variable Molybdenum, dissolved (mw-35-60) was not processed!**											
1814												
1815	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1816	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1817												
1818												
1819												
1820	**Molybdenum, dissolved (mw-37d)**											
1821												
1822	**General Statistics**											
1823	Number of Valid Observations				13		Number of Distinct Observations					12
1824												
1825	**Raw Statistics**						**Log-transformed Statistics**					
1826	Minimum				0.034		Minimum of Log Data					-3.381
1827	Maximum				0.0518		Maximum of Log Data					-2.96
1828	Mean				0.0444		Mean of log Data					-3.124
1829	Median				0.0455		SD of log Data					0.14
1830	SD				0.00582							
1831	Coefficient of Variation				0.131							
1832	Skewness				-0.957							
1833												
1834	**Relevant UCL Statistics**											
1835	**Normal Distribution Test**						**Lognormal Distribution Test**					
1836	Shapiro Wilk Test Statistic				0.855		Shapiro Wilk Test Statistic					0.825
1837	Shapiro Wilk Critical Value				0.866		Shapiro Wilk Critical Value					0.866
1838	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1839												
1840	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1841	95% Student's-t UCL				0.0472		95% H-UCL					0.0477
1842	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0519
1843	95% Adjusted-CLT UCL				0.0465		97.5% Chebyshev (MVUE) UCL					0.0552
1844	95% Modified-t UCL				0.0472		99% Chebyshev (MVUE) UCL					0.0616
1845												
1846	**Gamma Distribution Test**						**Data Distribution**					
1847	k star (bias corrected)				44.52		**Data do not follow a Discernable Distribution (0.05)**					
1848	Theta Star				0.0009962							
1849	nu star				1158							
1850	Approximate Chi Square Value (.05)				1080		**Nonparametric Statistics**					
1851	Adjusted Level of Significance				0.0301		95% CLT UCL					0.047
1852	Adjusted Chi Square Value				1069		95% Jackknife UCL					0.0472
1853							95% Standard Bootstrap UCL					0.0468
1854	Anderson-Darling Test Statistic				1.019		95% Bootstrap-t UCL					0.0467
1855	Anderson-Darling 5% Critical Value				0.732		95% Hall's Bootstrap UCL					0.0465

Kolmogorov-Smirnov Test Statistic	0.283	95% Percentile Bootstrap UCL 0.0468
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL 0.0465
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 0.0514
		97.5% Chebyshev(Mean, Sd) UCL 0.0544
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 0.0604
95% Approximate Gamma UCL	0.0476	
95% Adjusted Gamma UCL	0.048	
Potential UCL to Use		Use 95% Student's-t UCL 0.0472
		or 95% Modified-t UCL 0.0472

Molybdenum, dissolved (mw-37s)

General Statistics

Number of Valid Observations	1	Number of Distinct Observations	1

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Molybdenum, dissolved (mw-37s) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Molybdenum, dissolved (mw-38d)

General Statistics

Number of Valid Observations	1	Number of Distinct Observations	1

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Molybdenum, dissolved (mw-38d) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Molybdenum, dissolved (mw-38s)

General Statistics

Number of Valid Observations	1	Number of Distinct Observations	1

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Molybdenum, dissolved (mw-38s) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

1909	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1910												
1911												
1912												
1913	Molybdenum, dissolved (mw-39-60)											
1914												
1915	General Statistics											
1916	Number of Valid Observations	1				Number of Distinct Observations	1					
1917												
1918												
1919	Warning: This data set only has 1 observations!											
1920	Data set is too small to compute reliable and meaningful statistics and estimates!											
1921	The data set for variable Molybdenum, dissolved (mw-39-60) was not processed!											
1922												
1923	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1924	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1925												
1926												
1927												
1928	Molybdenum, dissolved (mw-4)											
1929												
1930	General Statistics											
1931	Number of Valid Data	12				Number of Detected Data	11					
1932	Number of Distinct Detected Data	8				Number of Non-Detect Data	1					
1933						Percent Non-Detects	8.33%					
1934												
1935	Raw Statistics					Log-transformed Statistics						
1936	Minimum Detected	0.014				Minimum Detected	-4.269					
1937	Maximum Detected	0.024				Maximum Detected	-3.73					
1938	Mean of Detected	0.0175				Mean of Detected	-4.061					
1939	SD of Detected	0.00309				SD of Detected	0.166					
1940	Minimum Non-Detect	0.05				Minimum Non-Detect	-2.996					
1941	Maximum Non-Detect	0.05				Maximum Non-Detect	-2.996					
1942												
1943												
1944	UCL Statistics											
1945	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
1946	Shapiro Wilk Test Statistic	0.866				Shapiro Wilk Test Statistic	0.902					
1947	5% Shapiro Wilk Critical Value	0.85				5% Shapiro Wilk Critical Value	0.85					
1948	Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level						
1949												
1950	Assuming Normal Distribution					Assuming Lognormal Distribution						
1951	DL/2 Substitution Method					DL/2 Substitution Method						
1952	Mean	0.0181				Mean	-4.03					
1953	SD	0.00367				SD	0.192					
1954	95% DL/2 (t) UCL	0.02				95% H-Stat (DL/2) UCL	0.0248					
1955												
1956	Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method						
1957	MLE method failed to converge properly					Mean in Log Scale	-4.061					
1958						SD in Log Scale	0.159					
1959						Mean in Original Scale	0.0174					
1960						SD in Original Scale	0.00295					
1961						95% Percentile Bootstrap UCL	0.0189					

1962											95% BCA Bootstrap UCL	0.0191
1963												
1964	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1965					k star (bias corrected)	27.96	Data appear Normal at 5% Significance Level					
1966					Theta Star	0.0006243						
1967					nu star	615.1						
1968												
1969					A-D Test Statistic	0.575	Nonparametric Statistics					
1970					5% A-D Critical Value	0.729					Kaplan-Meier (KM) Method	
1971					K-S Test Statistic	0.729					Mean	0.0175
1972					5% K-S Critical Value	0.255					SD	0.00295
1973	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.0009323
1974											95% KM (t) UCL	0.0191
1975	Assuming Gamma Distribution										95% KM (z) UCL	0.019
1976					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0191
1977					Minimum	0.014					95% KM (bootstrap t) UCL	0.0204
1978					Maximum	0.024					95% KM (BCA) UCL	0.0191
1979					Mean	0.0175					95% KM (Percentile Bootstrap) UCL	0.019
1980					Median	0.017					95% KM (Chebyshev) UCL	0.0215
1981					SD	0.00295					97.5% KM (Chebyshev) UCL	0.0233
1982					k star	31.34					99% KM (Chebyshev) UCL	0.0267
1983					Theta star	0.0005584						
1984					Nu star	752.1	Potential UCLs to Use					
1985					AppChi2	689.5					95% KM (t) UCL	0.0191
1986					95% Gamma Approximate UCL	0.0191					95% KM (Percentile Bootstrap) UCL	0.019
1987					95% Adjusted Gamma UCL	0.0193						
1988	Note: DL/2 is not a recommended method.											
1989												
1990												
1991	Molybdenum, dissolved (mw-40d)											
1992												
1993	General Statistics											
1994					Number of Valid Observations	1					Number of Distinct Observations	1
1995												
1996												
1997	Warning: This data set only has 1 observations!											
1998	Data set is too small to compute reliable and meaningful statistics and estimates!											
1999	The data set for variable Molybdenum, dissolved (mw-40d) was not processed!											
2000												
2001	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2002	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2003												
2004												
2005												
2006	Molybdenum, dissolved (mw-40s)											
2007												
2008	General Statistics											
2009					Number of Valid Observations	1					Number of Distinct Observations	1
2010												
2011												
2012	Warning: This data set only has 1 observations!											
2013	Data set is too small to compute reliable and meaningful statistics and estimates!											
2014	The data set for variable Molybdenum, dissolved (mw-40s) was not processed!											

	A	B	C	D	E	F	G	H	I	J	K	L
2015												
2016	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2017	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2018												
2019												
2020												
2021	Molybdenum, dissolved (mw-43-25)											
2022												
2023	General Statistics											
2024	Number of Valid Observations	3				Number of Distinct Observations	3					
2025												
2026												
2027	Warning: This data set only has 3 observations!											
2028	Data set is too small to compute reliable and meaningful statistics and estimates!											
2029	The data set for variable Molybdenum, dissolved (mw-43-25) was not processed!											
2030												
2031	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2032	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2033												
2034												
2035												
2036	Molybdenum, dissolved (mw-44-115)											
2037												
2038	General Statistics											
2039	Number of Valid Observations	3				Number of Distinct Observations	3					
2040												
2041												
2042	Warning: This data set only has 3 observations!											
2043	Data set is too small to compute reliable and meaningful statistics and estimates!											
2044	The data set for variable Molybdenum, dissolved (mw-44-115) was not processed!											
2045												
2046	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2047	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2048												
2049												
2050												
2051	Molybdenum, dissolved (mw-44-125)											
2052												
2053	General Statistics											
2054	Number of Valid Observations	1				Number of Distinct Observations	1					
2055												
2056												
2057	Warning: This data set only has 1 observations!											
2058	Data set is too small to compute reliable and meaningful statistics and estimates!											
2059	The data set for variable Molybdenum, dissolved (mw-44-125) was not processed!											
2060												
2061	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2062	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2063												
2064												
2065												
2066	Molybdenum, dissolved (mw-45-095a)											
2067												

	A	B	C	D	E	F	G	H	I	J	K	L
2068	General Statistics											
2069	Number of Valid Observations					1	Number of Distinct Observations					1
2070												
2071												
2072	Warning: This data set only has 1 observations!											
2073	Data set is too small to compute reliable and meaningful statistics and estimates!											
2074	The data set for variable Molybdenum, dissolved (mw-45-095a) was not processed!											
2075												
2076	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2077	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2078												
2079												
2080												
2081	Molybdenum, dissolved (mw-46-175)											
2082												
2083	General Statistics											
2084	Number of Valid Observations					1	Number of Distinct Observations					1
2085												
2086												
2087	Warning: This data set only has 1 observations!											
2088	Data set is too small to compute reliable and meaningful statistics and estimates!											
2089	The data set for variable Molybdenum, dissolved (mw-46-175) was not processed!											
2090												
2091	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2092	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2093												
2094												
2095												
2096	Molybdenum, dissolved (mw-47-55)											
2097												
2098	General Statistics											
2099	Number of Valid Observations					1	Number of Distinct Observations					1
2100												
2101												
2102	Warning: This data set only has 1 observations!											
2103	Data set is too small to compute reliable and meaningful statistics and estimates!											
2104	The data set for variable Molybdenum, dissolved (mw-47-55) was not processed!											
2105												
2106	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2107	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2108												
2109												
2110												
2111	Molybdenum, dissolved (mw-48)											
2112												
2113	General Statistics											
2114	Number of Valid Observations					3	Number of Distinct Observations					3
2115												
2116												
2117	Warning: This data set only has 3 observations!											
2118	Data set is too small to compute reliable and meaningful statistics and estimates!											
2119	The data set for variable Molybdenum, dissolved (mw-48) was not processed!											
2120												

	A	B	C	D	E	F	G	H	I	J	K	L
2121	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2122	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2123												
2124												
2125												
2126	**Molybdenum, dissolved (mw-5)**											
2127												
2128	**General Statistics**											
2129	Number of Valid Data					12	Number of Detected Data					11
2130	Number of Distinct Detected Data					8	Number of Non-Detect Data					1
2131							Percent Non-Detects					8.33%
2132												
2133	**Raw Statistics**						**Log-transformed Statistics**					
2134	Minimum Detected					0.039	Minimum Detected					-3.244
2135	Maximum Detected					0.15	Maximum Detected					-1.897
2136	Mean of Detected					0.0528	Mean of Detected					-3.037
2137	SD of Detected					0.0326	SD of Detected					0.392
2138	Minimum Non-Detect					0.05	Minimum Non-Detect					-2.996
2139	Maximum Non-Detect					0.05	Maximum Non-Detect					-2.996
2140												
2141												
2142	**UCL Statistics**											
2143	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2144	Shapiro Wilk Test Statistic					0.465	Shapiro Wilk Test Statistic					0.568
2145	5% Shapiro Wilk Critical Value					0.85	5% Shapiro Wilk Critical Value					0.85
2146	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2147												
2148	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2149	DL/2 Substitution Method						DL/2 Substitution Method					
2150	Mean					0.0505	Mean					-3.091
2151	SD					0.0321	SD					0.419
2152	95% DL/2 (t) UCL					0.0671	95% H-Stat (DL/2) UCL					0.066
2153												
2154	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2155	**MLE yields a negative mean**						Mean in Log Scale					-3.047
2156							SD in Log Scale					0.375
2157							Mean in Original Scale					0.0519
2158							SD in Original Scale					0.0312
2159							95% Percentile Bootstrap UCL					0.0693
2160							95% BCA Bootstrap UCL					0.0788
2161												
2162	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2163	k star (bias corrected)					3.995	**Data do not follow a Discernable Distribution (0.05)**					
2164	Theta Star					0.0132						
2165	nu star					87.89						
2166												
2167	A-D Test Statistic					2.232	**Nonparametric Statistics**					
2168	5% A-D Critical Value					0.731	Kaplan-Meier (KM) Method					
2169	K-S Test Statistic					0.731	Mean					0.0518
2170	5% K-S Critical Value					0.256	SD					0.0299
2171	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.00907
2172							95% KM (t) UCL					0.0681
2173	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0667

2174	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL		0.068
2175					Minimum	0.039				95% KM (bootstrap t) UCL		0.148
2176					Maximum	0.15				95% KM (BCA) UCL		0.0699
2177					Mean	0.0526				95% KM (Percentile Bootstrap) UCL		0.0693
2178					Median	0.042				95% KM (Chebyshev) UCL		0.0913
2179					SD	0.0311				97.5% KM (Chebyshev) UCL		0.108
2180					k star	4.466				99% KM (Chebyshev) UCL		0.142
2181					Theta star	0.0118						
2182					Nu star	107.2				**Potential UCLs to Use**		
2183					AppChi2	84.28				95% KM (Chebyshev) UCL		0.0913
2184				95% Gamma Approximate UCL		0.0668						
2185				95% Adjusted Gamma UCL		0.0694						
2186	**Note: DL/2 is not a recommended method.**											
2187												
2188												
2189	**Molybdenum, dissolved (mw-50-200)**											
2190												
2191	**General Statistics**											
2192	Number of Valid Observations					3				Number of Distinct Observations		3
2193												
2194												
2195	**Warning: This data set only has 3 observations!**											
2196	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2197	**The data set for variable Molybdenum, dissolved (mw-50-200) was not processed!**											
2198												
2199	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2200	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2201												
2202												
2203												
2204	**Molybdenum, dissolved (mw-51)**											
2205												
2206	**General Statistics**											
2207	Number of Valid Observations					3				Number of Distinct Observations		3
2208												
2209												
2210	**Warning: This data set only has 3 observations!**											
2211	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2212	**The data set for variable Molybdenum, dissolved (mw-51) was not processed!**											
2213												
2214	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2215	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2216												
2217												
2218												
2219	**Molybdenum, dissolved (mw-6)**											
2220												
2221	**General Statistics**											
2222	Number of Valid Data					12				Number of Detected Data		11
2223	Number of Distinct Detected Data					11				Number of Non-Detect Data		1
2224										Percent Non-Detects		8.33%
2225												
2226	**Raw Statistics**									**Log-transformed Statistics**		

2227					Minimum Detected	0.0055					Minimum Detected	-5.203
2228					Maximum Detected	0.022					Maximum Detected	-3.817
2229					Mean of Detected	0.00818					Mean of Detected	-4.898
2230					SD of Detected	0.00476					SD of Detected	0.397
2231					Minimum Non-Detect	0.05					Minimum Non-Detect	-2.996
2232					Maximum Non-Detect	0.05					Maximum Non-Detect	-2.996
2233												
2234												
2235	**UCL Statistics**											
2236	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2237					Shapiro Wilk Test Statistic	0.564					Shapiro Wilk Test Statistic	0.709
2238					5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85
2239	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2240												
2241	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2242					DL/2 Substitution Method						DL/2 Substitution Method	
2243					Mean	0.00958					Mean	-4.797
2244					SD	0.00664					SD	0.515
2245					95% DL/2 (t) UCL	0.013					95% H-Stat (DL/2) UCL	0.0181
2246												
2247					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2248	**MLE method failed to converge properly**										Mean in Log Scale	-4.898
2249											SD in Log Scale	0.379
2250											Mean in Original Scale	0.00812
2251											SD in Original Scale	0.00454
2252											95% Percentile Bootstrap UCL	0.0105
2253											95% BCA Bootstrap UCL	0.0117
2254												
2255	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2256					k star (bias corrected)	4.119	**Data do not follow a Discernable Distribution (0.05)**					
2257					Theta Star	0.00199						
2258					nu star	90.62						
2259												
2260					A-D Test Statistic	1.538	**Nonparametric Statistics**					
2261					5% A-D Critical Value	0.731					Kaplan-Meier (KM) Method	
2262					K-S Test Statistic	0.731					Mean	0.00818
2263					5% K-S Critical Value	0.256					SD	0.00453
2264	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00143
2265											95% KM (t) UCL	0.0108
2266	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0105
2267					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0108
2268					Minimum	0.0055					95% KM (bootstrap t) UCL	0.0199
2269					Maximum	0.022					95% KM (BCA) UCL	0.0108
2270					Mean	0.00822					95% KM (Percentile Bootstrap) UCL	0.0109
2271					Median	0.00675					95% KM (Chebyshev) UCL	0.0144
2272					SD	0.00454					97.5% KM (Chebyshev) UCL	0.0171
2273					k star	4.604					99% KM (Chebyshev) UCL	0.0224
2274					Theta star	0.00179						
2275					Nu star	110.5	**Potential UCLs to Use**					
2276					AppChi2	87.24					95% KM (Chebyshev) UCL	0.0144
2277					95% Gamma Approximate UCL	0.0104						
2278					95% Adjusted Gamma UCL	0.0108						
2279	**Note: DL/2 is not a recommended method.**											

2280												
2281												
2282	**Molybdenum, dissolved (mw-7)**											
2283												
2284	**General Statistics**											
2285						Number of Valid Data	12				Number of Detected Data	11
2286						Number of Distinct Detected Data	8				Number of Non-Detect Data	1
2287											Percent Non-Detects	8.33%
2288												
2289	**Raw Statistics**							**Log-transformed Statistics**				
2290						Minimum Detected	0.017				Minimum Detected	-4.075
2291						Maximum Detected	0.026				Maximum Detected	-3.65
2292						Mean of Detected	0.0201				Mean of Detected	-3.914
2293						SD of Detected	0.00287				SD of Detected	0.138
2294						Minimum Non-Detect	0.05				Minimum Non-Detect	-2.996
2295						Maximum Non-Detect	0.05				Maximum Non-Detect	-2.996
2296												
2297												
2298	**UCL Statistics**											
2299	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
2300						Shapiro Wilk Test Statistic	0.903				Shapiro Wilk Test Statistic	0.92
2301						5% Shapiro Wilk Critical Value	0.85				5% Shapiro Wilk Critical Value	0.85
2302	**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
2303												
2304	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
2305						DL/2 Substitution Method					DL/2 Substitution Method	
2306						Mean	0.0205				Mean	-3.895
2307						SD	0.00308				SD	0.147
2308						95% DL/2 (t) UCL	0.0221				95% H-Stat (DL/2) UCL	0.0271
2309												
2310						Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method	
2311	**MLE method failed to converge properly**										Mean in Log Scale	-3.914
2312											SD in Log Scale	0.131
2313											Mean in Original Scale	0.0201
2314											SD in Original Scale	0.00274
2315											95% Percentile Bootstrap UCL	0.0214
2316											95% BCA Bootstrap UCL	0.0215
2317												
2318	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
2319						k star (bias corrected)	41.44	**Data appear Normal at 5% Significance Level**				
2320						Theta Star	0.0004859					
2321						nu star	911.6					
2322												
2323						A-D Test Statistic	0.391	**Nonparametric Statistics**				
2324						5% A-D Critical Value	0.728	Kaplan-Meier (KM) Method				
2325						K-S Test Statistic	0.728				Mean	0.0201
2326						5% K-S Critical Value	0.255				SD	0.00274
2327	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0008653
2328											95% KM (t) UCL	0.0217
2329	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0216
2330						Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.0217
2331						Minimum	0.017				95% KM (bootstrap t) UCL	0.0223
2332						Maximum	0.026				95% KM (BCA) UCL	0.0214

2333					Mean	0.0202				95% KM (Percentile Bootstrap) UCL		0.0215
2334					Median	0.0202				95% KM (Chebyshev) UCL		0.0239
2335					SD	0.00274				97.5% KM (Chebyshev) UCL		0.0255
2336					k star	46.44				99% KM (Chebyshev) UCL		0.0287
2337					Theta star	0.0004346						
2338					Nu star	1115				**Potential UCLs to Use**		
2339					AppChi2	1038				95% KM (t) UCL		0.0217
2340					95% Gamma Approximate UCL	0.0217				95% KM (Percentile Bootstrap) UCL		0.0215
2341					95% Adjusted Gamma UCL	0.0219						
2342	**Note: DL/2 is not a recommended method.**											
2343												
2344												
2345	**Molybdenum, dissolved (mw-8)**											
2346												
2347						**General Statistics**						
2348					Number of Valid Data	12				Number of Detected Data		11
2349					Number of Distinct Detected Data	9				Number of Non-Detect Data		1
2350										Percent Non-Detects		8.33%
2351												
2352					**Raw Statistics**					**Log-transformed Statistics**		
2353					Minimum Detected	0.014				Minimum Detected		-4.269
2354					Maximum Detected	0.022				Maximum Detected		-3.817
2355					Mean of Detected	0.0184				Mean of Detected		-4.005
2356					SD of Detected	0.00235				SD of Detected		0.132
2357					Minimum Non-Detect	0.05				Minimum Non-Detect		-2.996
2358					Maximum Non-Detect	0.05				Maximum Non-Detect		-2.996
2359												
2360												
2361						**UCL Statistics**						
2362					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
2363					Shapiro Wilk Test Statistic	0.975				Shapiro Wilk Test Statistic		0.958
2364					5% Shapiro Wilk Critical Value	0.85				5% Shapiro Wilk Critical Value		0.85
2365					**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
2366												
2367					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
2368					DL/2 Substitution Method					DL/2 Substitution Method		
2369					Mean	0.0189				Mean		-3.979
2370					SD	0.00295				SD		0.156
2371					95% DL/2 (t) UCL	0.0204				95% H-Stat (DL/2) UCL		0.0254
2372												
2373					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
2374					**MLE method failed to converge properly**					Mean in Log Scale		-4.005
2375										SD in Log Scale		0.126
2376										Mean in Original Scale		0.0184
2377										SD in Original Scale		0.00224
2378										95% Percentile Bootstrap UCL		0.0194
2379										95% BCA Bootstrap UCL		0.0193
2380												
2381					**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**		
2382					k star (bias corrected)	47.13				**Data appear Normal at 5% Significance Level**		
2383					Theta Star	0.0003896						
2384					nu star	1037						
2385												

2386				A-D Test Statistic	0.241		**Nonparametric Statistics**					
2387				5% A-D Critical Value	0.728					Kaplan-Meier (KM) Method		
2388				K-S Test Statistic	0.728					Mean		0.0184
2389				5% K-S Critical Value	0.255					SD		0.00224
2390	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.0007074
2391										95% KM (t) UCL		0.0196
2392	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0195
2393	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL		0.0196
2394				Minimum	0.014					95% KM (bootstrap t) UCL		0.0195
2395				Maximum	0.022					95% KM (BCA) UCL		0.0195
2396				Mean	0.0184					95% KM (Percentile Bootstrap) UCL		0.0195
2397				Median	0.0187					95% KM (Chebyshev) UCL		0.0214
2398				SD	0.00224					97.5% KM (Chebyshev) UCL		0.0228
2399				k star	52.8					99% KM (Chebyshev) UCL		0.0254
2400				Theta star	0.0003486							
2401				Nu star	1267		**Potential UCLs to Use**					
2402				AppChi2	1186					95% KM (t) UCL		0.0196
2403				95% Gamma Approximate UCL	0.0197					95% KM (Percentile Bootstrap) UCL		0.0195
2404				95% Adjusted Gamma UCL	0.0199							
2405	**Note: DL/2 is not a recommended method.**											
2406												
2407												
2408	**Molybdenum, dissolved (mw-9)**											
2409												
2410	**General Statistics**											
2411				Number of Valid Data	5					Number of Detected Data		2
2412				Number of Distinct Detected Data	2					Number of Non-Detect Data		3
2413										Percent Non-Detects		60.00%
2414												
2415	**Raw Statistics**						**Log-transformed Statistics**					
2416				Minimum Detected	0.0014					Minimum Detected		-6.571
2417				Maximum Detected	0.0053					Maximum Detected		-5.24
2418				Mean of Detected	0.00335					Mean of Detected		-5.906
2419				SD of Detected	0.00276					SD of Detected		0.941
2420				Minimum Non-Detect	0.002					Minimum Non-Detect		-6.215
2421				Maximum Non-Detect	0.005					Maximum Non-Detect		-5.298
2422												
2423	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		4
2424	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
2425	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		80.00%
2426												
2427	**Warning: Data set has only 2 Distinct Detected Values.**											
2428	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
2429	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2430												
2431	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
2432												
2433	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2434	**Those methods will return a 'N/A' value on your output display!**											
2435												
2436	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2437	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2438												

2439												
2440	**UCL Statistics**											
2441	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2442					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
2443					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
2444	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2445												
2446	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2447					DL/2 Substitution Method						DL/2 Substitution Method	
2448					Mean	0.00254					Mean	-6.14
2449					SD	0.00168					SD	0.638
2450					95% DL/2 (t) UCL	0.00414					95% H-Stat (DL/2) UCL	0.027
2451												
2452					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2453	**MLE method failed to converge properly**										Mean in Log Scale	N/A
2454											SD in Log Scale	N/A
2455											Mean in Original Scale	N/A
2456											SD in Original Scale	N/A
2457											95% Percentile Bootstrap UCL	N/A
2458											95% BCA Bootstrap UCL	N/A
2459												
2460	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2461					k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**					
2462					Theta Star	N/A						
2463					nu star	N/A						
2464												
2465					A-D Test Statistic	0.359	**Nonparametric Statistics**					
2466					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
2467					K-S Test Statistic	N/A					Mean	0.00218
2468					5% K-S Critical Value	N/A					SD	0.00156
2469	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0009866
2470											95% KM (t) UCL	0.00428
2471	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0038
2472					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00548
2473					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
2474					Maximum	N/A					95% KM (BCA) UCL	0.0053
2475					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0053
2476					Median	N/A					95% KM (Chebyshev) UCL	0.00648
2477					SD	N/A					97.5% KM (Chebyshev) UCL	0.00834
2478					k star	N/A					99% KM (Chebyshev) UCL	0.012
2479					Theta star	N/A						
2480					Nu star	N/A	**Potential UCLs to Use**					
2481					AppChi2	N/A					95% KM (t) UCL	0.00428
2482					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.0053
2483					95% Adjusted Gamma UCL	N/A						
2484	**Note: DL/2 is not a recommended method.**											
2485												
2486												
2487	**Molybdenum, dissolved (ow-1d)**											
2488												
2489	**General Statistics**											
2490					Number of Valid Observations	17					Number of Distinct Observations	17
2491												

2492	**Raw Statistics**						**Log-transformed Statistics**					
2493					Minimum	0.0088					Minimum of Log Data	-4.733
2494					Maximum	0.0518					Maximum of Log Data	-2.96
2495					Mean	0.0267					Mean of log Data	-3.745
2496					Median	0.0262					SD of log Data	0.524
2497					SD	0.0133						
2498					Coefficient of Variation	0.498						
2499					Skewness	0.485						
2500												
2501	**Relevant UCL Statistics**											
2502	**Normal Distribution Test**						**Lognormal Distribution Test**					
2503					Shapiro Wilk Test Statistic	0.917					Shapiro Wilk Test Statistic	0.942
2504					Shapiro Wilk Critical Value	0.892					Shapiro Wilk Critical Value	0.892
2505	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2506												
2507	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2508					95% Student's-t UCL	0.0324					95% H-UCL	0.0355
2509	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0423
2510					95% Adjusted-CLT UCL	0.0325					97.5% Chebyshev (MVUE) UCL	0.0489
2511					95% Modified-t UCL	0.0324					99% Chebyshev (MVUE) UCL	0.062
2512												
2513	**Gamma Distribution Test**						**Data Distribution**					
2514					k star (bias corrected)	3.497	**Data appear Normal at 5% Significance Level**					
2515					Theta Star	0.00765						
2516					nu star	118.9						
2517					Approximate Chi Square Value (.05)	94.72	**Nonparametric Statistics**					
2518					Adjusted Level of Significance	0.0346					95% CLT UCL	0.0321
2519					Adjusted Chi Square Value	92.46					95% Jackknife UCL	0.0324
2520											95% Standard Bootstrap UCL	0.032
2521					Anderson-Darling Test Statistic	0.51					95% Bootstrap-t UCL	0.033
2522					Anderson-Darling 5% Critical Value	0.743					95% Hall's Bootstrap UCL	0.032
2523					Kolmogorov-Smirnov Test Statistic	0.207					95% Percentile Bootstrap UCL	0.0321
2524					Kolmogorov-Smirnov 5% Critical Value	0.21					95% BCA Bootstrap UCL	0.0321
2525	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.0408
2526											97.5% Chebyshev(Mean, Sd) UCL	0.0469
2527	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.0589
2528					95% Approximate Gamma UCL	0.0336						
2529					95% Adjusted Gamma UCL	0.0344						
2530												
2531	**Potential UCL to Use**										Use 95% Student's-t UCL	0.0324
2532												
2533												
2534	**Molybdenum, dissolved (ow-1m)**											
2535												
2536	**General Statistics**											
2537					Number of Valid Data	17					Number of Detected Data	16
2538					Number of Distinct Detected Data	15					Number of Non-Detect Data	1
2539											Percent Non-Detects	5.88%
2540												
2541	**Raw Statistics**						**Log-transformed Statistics**					
2542					Minimum Detected	0.0075					Minimum Detected	-4.893
2543					Maximum Detected	0.027					Maximum Detected	-3.612
2544					Mean of Detected	0.0157					Mean of Detected	-4.242

	A	B	C	D	E	F	G	H	I	J	K	L
2545					SD of Detected	0.00687					SD of Detected	0.428
2546					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
2547					Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298
2548												
2549												
2550	**UCL Statistics**											
2551	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2552					Shapiro Wilk Test Statistic	0.871					Shapiro Wilk Test Statistic	0.931
2553					5% Shapiro Wilk Critical Value	0.887					5% Shapiro Wilk Critical Value	0.887
2554	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2555												
2556	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2557					DL/2 Substitution Method						DL/2 Substitution Method	
2558					Mean	0.0149					Mean	-4.345
2559					SD	0.00738					SD	0.593
2560					95% DL/2 (t) UCL	0.018					95% H-Stat (DL/2) UCL	0.0195
2561												
2562					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2563					Mean	0.0149					Mean in Log Scale	-4.304
2564					SD	0.00728					SD in Log Scale	0.486
2565					95% MLE (t) UCL	0.0179					Mean in Original Scale	0.0151
2566					95% MLE (Tiku) UCL	0.0179					SD in Original Scale	0.00713
2567											95% Percentile Bootstrap UCL	0.0177
2568											95% BCA Bootstrap UCL	0.018
2569												
2570	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2571					k star (bias corrected)	4.85	**Data appear Gamma Distributed at 5% Significance Level**					
2572					Theta Star	0.00323						
2573					nu star	155.2						
2574												
2575					A-D Test Statistic	0.522	**Nonparametric Statistics**					
2576					5% A-D Critical Value	0.741					Kaplan-Meier (KM) Method	
2577					K-S Test Statistic	0.741					Mean	0.0152
2578					5% K-S Critical Value	0.216					SD	0.00673
2579	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00169
2580											95% KM (t) UCL	0.0181
2581	**Assuming Gamma Distribution**										95% KM (z) UCL	0.018
2582					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0181
2583					Minimum	0.00153					95% KM (bootstrap t) UCL	0.0188
2584					Maximum	0.027					95% KM (BCA) UCL	0.0182
2585					Mean	0.0148					95% KM (Percentile Bootstrap) UCL	0.0179
2586					Median	0.0126					95% KM (Chebyshev) UCL	0.0225
2587					SD	0.00748					97.5% KM (Chebyshev) UCL	0.0257
2588					k star	2.68					99% KM (Chebyshev) UCL	0.032
2589					Theta star	0.00554						
2590					Nu star	91.11	**Potential UCLs to Use**					
2591					AppChi2	70.1					95% KM (BCA) UCL	0.0182
2592					95% Gamma Approximate UCL	0.0193						
2593					95% Adjusted Gamma UCL	0.0198						
2594	**Note: DL/2 is not a recommended method.**											
2595												
2596												
2597	**Molybdenum, dissolved (ow-1s)**											

General Statistics		
Number of Valid Data	15	Number of Detected Data	14
Number of Distinct Detected Data	14	Number of Non-Detect Data	1
		Percent Non-Detects	6.67%
Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.0055	Minimum Detected	-5.203
Maximum Detected	0.0273	Maximum Detected	-3.601
Mean of Detected	0.0121	Mean of Detected	-4.493
SD of Detected	0.00543	SD of Detected	0.404
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.005	Maximum Non-Detect	-5.298
UCL Statistics			
Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.86	Shapiro Wilk Test Statistic	0.98
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0115	Mean	-4.593
SD	0.00579	SD	0.549
95% DL/2 (t) UCL	0.0141	95% H-Stat (DL/2) UCL	0.0147
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0114	Mean in Log Scale	-4.559
SD	0.00566	SD in Log Scale	0.465
95% MLE (t) UCL	0.014	Mean in Original Scale	0.0116
95% MLE (Tiku) UCL	0.014	SD in Original Scale	0.00562
		95% Percentile Bootstrap UCL	0.0141
		95% BCA Bootstrap UCL	0.0148
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	5.138	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	0.00236		
nu star	143.9		
A-D Test Statistic	0.259	**Nonparametric Statistics**	
5% A-D Critical Value	0.737	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.737	Mean	0.0117
5% K-S Critical Value	0.229	SD	0.00532
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00142
		95% KM (t) UCL	0.0142
Assuming Gamma Distribution		95% KM (z) UCL	0.014
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.0141
Minimum	0.00204	95% KM (bootstrap t) UCL	0.0151
Maximum	0.0273	95% KM (BCA) UCL	0.014
Mean	0.0114	95% KM (Percentile Bootstrap) UCL	0.014
Median	0.0106	95% KM (Chebyshev) UCL	0.0179
SD	0.00584	97.5% KM (Chebyshev) UCL	0.0206

2651					k star	3.121				99% KM (Chebyshev) UCL		0.0258
2652					Theta star	0.00367						
2653					Nu star	93.63				**Potential UCLs to Use**		
2654					AppChi2	72.31				95% KM (BCA) UCL		0.014
2655					95% Gamma Approximate UCL	0.0148						
2656					95% Adjusted Gamma UCL	0.0153						
2657	**Note: DL/2 is not a recommended method.**											
2658												
2659												
2660	**Molybdenum, dissolved (ow-2d)**											
2661												
2662					**General Statistics**							
2663					Number of Valid Observations	16				Number of Distinct Observations		14
2664												
2665					**Raw Statistics**					**Log-transformed Statistics**		
2666					Minimum	0.0082				Minimum of Log Data		-4.804
2667					Maximum	0.0665				Maximum of Log Data		-2.711
2668					Mean	0.0205				Mean of log Data		-4.16
2669					Median	0.0127				SD of log Data		0.682
2670					SD	0.0191						
2671					Coefficient of Variation	0.93						
2672					Skewness	1.805						
2673												
2674					**Relevant UCL Statistics**							
2675					**Normal Distribution Test**					**Lognormal Distribution Test**		
2676					Shapiro Wilk Test Statistic	0.625				Shapiro Wilk Test Statistic		0.765
2677					Shapiro Wilk Critical Value	0.887				Shapiro Wilk Critical Value		0.887
2678					**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**		
2679												
2680					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
2681					95% Student's-t UCL	0.0289				95% H-UCL		0.0293
2682					**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL		0.0345
2683					95% Adjusted-CLT UCL	0.0306				97.5% Chebyshev (MVUE) UCL		0.0411
2684					95% Modified-t UCL	0.0292				99% Chebyshev (MVUE) UCL		0.054
2685												
2686					**Gamma Distribution Test**					**Data Distribution**		
2687					k star (bias corrected)	1.653				**Data do not follow a Discernable Distribution (0.05)**		
2688					Theta Star	0.0124						
2689					nu star	52.89						
2690					Approximate Chi Square Value (.05)	37.19				**Nonparametric Statistics**		
2691					Adjusted Level of Significance	0.0335				95% CLT UCL		0.0283
2692					Adjusted Chi Square Value	35.69				95% Jackknife UCL		0.0289
2693										95% Standard Bootstrap UCL		0.0279
2694					Anderson-Darling Test Statistic	2.158				95% Bootstrap-t UCL		0.0333
2695					Anderson-Darling 5% Critical Value	0.75				95% Hall's Bootstrap UCL		0.0264
2696					Kolmogorov-Smirnov Test Statistic	0.352				95% Percentile Bootstrap UCL		0.0279
2697					Kolmogorov-Smirnov 5% Critical Value	0.218				95% BCA Bootstrap UCL		0.0304
2698					**Data not Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL		0.0413
2699										97.5% Chebyshev(Mean, Sd) UCL		0.0503
2700					**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL		0.0679
2701					95% Approximate Gamma UCL	0.0292						
2702					95% Adjusted Gamma UCL	0.0304						
2703												

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0413

Molybdenum, dissolved (ow-2m)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	14

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0081	Minimum of Log Data	-4.816
Maximum	0.0353	Maximum of Log Data	-3.344
Mean	0.0167	Mean of log Data	-4.181
Median	0.0136	SD of log Data	0.426
SD	0.00805		
Coefficient of Variation	0.481		
Skewness	1.41		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.832	Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0204	95% H-UCL	0.021
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0248
95% Adjusted-CLT UCL	0.021	97.5% Chebyshev (MVUE) UCL	0.0283
95% Modified-t UCL	0.0205	99% Chebyshev (MVUE) UCL	0.0352
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.57	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	0.00366		
nu star	137.1		
Approximate Chi Square Value (.05)	111	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.0202
Adjusted Chi Square Value	108.2	95% Jackknife UCL	0.0204
		95% Standard Bootstrap UCL	0.0201
Anderson-Darling Test Statistic	0.612	95% Bootstrap-t UCL	0.0221
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	0.0226
Kolmogorov-Smirnov Test Statistic	0.212	95% Percentile Bootstrap UCL	0.0203
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	0.0207
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0258
		97.5% Chebyshev(Mean, Sd) UCL	0.0297
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0374
95% Approximate Gamma UCL	0.0207		
95% Adjusted Gamma UCL	0.0212		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0207

Molybdenum, dissolved (ow-2s)

General Statistics

2757	Number of Valid Observations				15		Number of Distinct Observations					15
2758												
2759	**Raw Statistics**						**Log-transformed Statistics**					
2760	Minimum				0.029		Minimum of Log Data					-3.54
2761	Maximum				0.0893		Maximum of Log Data					-2.416
2762	Mean				0.0414		Mean of log Data					-3.223
2763	Median				0.0383		SD of log Data					0.27
2764	SD				0.0144							
2765	Coefficient of Variation				0.348							
2766	Skewness				2.871							
2767												
2768	**Relevant UCL Statistics**											
2769	**Normal Distribution Test**						**Lognormal Distribution Test**					
2770	Shapiro Wilk Test Statistic				0.669		Shapiro Wilk Test Statistic					0.826
2771	Shapiro Wilk Critical Value				0.881		Shapiro Wilk Critical Value					0.881
2772	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2773												
2774	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2775	95% Student's-t UCL				0.048		95% H-UCL					0.0472
2776	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0538
2777	95% Adjusted-CLT UCL				0.0505		97.5% Chebyshev (MVUE) UCL					0.0593
2778	95% Modified-t UCL				0.0485		99% Chebyshev (MVUE) UCL					0.07
2779												
2780	**Gamma Distribution Test**						**Data Distribution**					
2781	k star (bias corrected)				10.21		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
2782	Theta Star				0.00406							
2783	nu star				306.2							
2784	Approximate Chi Square Value (.05)				266.6		**Nonparametric Statistics**					
2785	Adjusted Level of Significance				0.0324		95% CLT UCL					0.0476
2786	Adjusted Chi Square Value				262.1		95% Jackknife UCL					0.048
2787							95% Standard Bootstrap UCL					0.0473
2788	Anderson-Darling Test Statistic				0.995		95% Bootstrap-t UCL					0.0552
2789	Anderson-Darling 5% Critical Value				0.737		95% Hall's Bootstrap UCL					0.0731
2790	Kolmogorov-Smirnov Test Statistic				0.208		95% Percentile Bootstrap UCL					0.0483
2791	Kolmogorov-Smirnov 5% Critical Value				0.221		95% BCA Bootstrap UCL					0.0508
2792	**Data follow Appr. Gamma Distribution at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.0577
2793							97.5% Chebyshev(Mean, Sd) UCL					0.0647
2794	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.0785
2795	95% Approximate Gamma UCL				0.0476							
2796	95% Adjusted Gamma UCL				0.0484							
2797												
2798	**Potential UCL to Use**						Use 95% Approximate Gamma UCL					0.0476
2799												
2800												
2801	**Molybdenum, dissolved (ow-3d)**											
2802												
2803	**General Statistics**											
2804	Number of Valid Observations				2		Number of Distinct Observations					2
2805												
2806												
2807	**Warning: This data set only has 2 observations!**											
2808	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2809	**The data set for variable Molybdenum, dissolved (ow-3d) was not processed!**											

2810												
2811	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2812	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2813												
2814												
2815												
2816	**Molybdenum, dissolved (ow-3m)**											
2817												
2818	**General Statistics**											
2819					Number of Valid Observations	4				Number of Distinct Observations	4	
2820												
2821												
2822	**Warning: This data set only has 4 observations!**											
2823	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2824	**The data set for variable Molybdenum, dissolved (ow-3m) was not processed!**											
2825												
2826	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2827	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2828												
2829												
2830												
2831	**Molybdenum, dissolved (ow-3s)**											
2832												
2833	**General Statistics**											
2834					Number of Valid Observations	3				Number of Distinct Observations	3	
2835												
2836												
2837	**Warning: This data set only has 3 observations!**											
2838	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2839	**The data set for variable Molybdenum, dissolved (ow-3s) was not processed!**											
2840												
2841	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2842	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2843												
2844												
2845												
2846	**Molybdenum, dissolved (ow-5d)**											
2847												
2848	**General Statistics**											
2849					Number of Valid Observations	16				Number of Distinct Observations	16	
2850												
2851	**Raw Statistics**						**Log-transformed Statistics**					
2852					Minimum	0.0118				Minimum of Log Data	-4.44	
2853					Maximum	0.0838				Maximum of Log Data	-2.479	
2854					Mean	0.0349				Mean of log Data	-3.572	
2855					Median	0.0316				SD of log Data	0.695	
2856					SD	0.0226						
2857					Coefficient of Variation	0.649						
2858					Skewness	0.625						
2859												
2860	**Relevant UCL Statistics**											
2861	**Normal Distribution Test**						**Lognormal Distribution Test**					
2862					Shapiro Wilk Test Statistic	0.866				Shapiro Wilk Test Statistic	0.865	

2863				Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
2864	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2865												
2866	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2867				95% Student's-t UCL	0.0448					95% H-UCL	0.0538
2868	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.0632
2869				95% Adjusted-CLT UCL	0.0451					97.5% Chebyshev (MVUE) UCL	0.0754
2870				95% Modified-t UCL	0.045					99% Chebyshev (MVUE) UCL	0.0993
2871												
2872	**Gamma Distribution Test**						**Data Distribution**					
2873				k star (bias corrected)	2.043		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
2874				Theta Star	0.0171							
2875				nu star	65.38							
2876				Approximate Chi Square Value (.05)	47.78		**Nonparametric Statistics**					
2877				Adjusted Level of Significance	0.0335					95% CLT UCL	0.0442
2878				Adjusted Chi Square Value	46.07					95% Jackknife UCL	0.0448
2879										95% Standard Bootstrap UCL	0.0439
2880				Anderson-Darling Test Statistic	0.981					95% Bootstrap-t UCL	0.0466
2881				Anderson-Darling 5% Critical Value	0.748					95% Hall's Bootstrap UCL	0.0452
2882				Kolmogorov-Smirnov Test Statistic	0.203					95% Percentile Bootstrap UCL	0.0447
2883				Kolmogorov-Smirnov 5% Critical Value	0.217					95% BCA Bootstrap UCL	0.0446
2884	**Data follow Appr. Gamma Distribution at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.0596
2885										97.5% Chebyshev(Mean, Sd) UCL	0.0702
2886	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.0912
2887				95% Approximate Gamma UCL	0.0477						
2888				95% Adjusted Gamma UCL	0.0495						
2889											
2890	**Potential UCL to Use**									Use 95% Approximate Gamma UCL	0.0477
2891											
2892											
2893	**Molybdenum, dissolved (ow-5m)**											
2894												
2895	**General Statistics**											
2896				Number of Valid Observations	16					Number of Distinct Observations	16	
2897												
2898	**Raw Statistics**						**Log-transformed Statistics**					
2899				Minimum	0.0098					Minimum of Log Data	-4.625	
2900				Maximum	0.0501					Maximum of Log Data	-2.994	
2901				Mean	0.0266					Mean of log Data	-3.724	
2902				Median	0.0255					SD of log Data	0.466	
2903				SD	0.0115							
2904				Coefficient of Variation	0.435							
2905				Skewness	0.513							
2906												
2907	**Relevant UCL Statistics**											
2908	**Normal Distribution Test**						**Lognormal Distribution Test**					
2909				Shapiro Wilk Test Statistic	0.964					Shapiro Wilk Test Statistic	0.97	
2910				Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887	
2911	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2912												
2913	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2914				95% Student's-t UCL	0.0316					95% H-UCL	0.0343	
2915	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.0406	

2916				95% Adjusted-CLT UCL	0.0317					97.5% Chebyshev (MVUE) UCL	0.0467	
2917				95% Modified-t UCL	0.0317					99% Chebyshev (MVUE) UCL	0.0585	
2918												
2919				**Gamma Distribution Test**						**Data Distribution**		
2920				k star (bias corrected)	4.422					**Data appear Normal at 5% Significance Level**		
2921				Theta Star	0.006							
2922				nu star	141.5							
2923				Approximate Chi Square Value (.05)	115					**Nonparametric Statistics**		
2924				Adjusted Level of Significance	0.0335					95% CLT UCL	0.0313	
2925				Adjusted Chi Square Value	112.3					95% Jackknife UCL	0.0316	
2926										95% Standard Bootstrap UCL	0.0311	
2927				Anderson-Darling Test Statistic	0.157					95% Bootstrap-t UCL	0.0319	
2928				Anderson-Darling 5% Critical Value	0.741					95% Hall's Bootstrap UCL	0.0321	
2929				Kolmogorov-Smirnov Test Statistic	0.109					95% Percentile Bootstrap UCL	0.0312	
2930				Kolmogorov-Smirnov 5% Critical Value	0.216					95% BCA Bootstrap UCL	0.0314	
2931				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0391	
2932										97.5% Chebyshev(Mean, Sd) UCL	0.0446	
2933				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0553	
2934				95% Approximate Gamma UCL	0.0327							
2935				95% Adjusted Gamma UCL	0.0335							
2936												
2937				**Potential UCL to Use**						Use 95% Student's-t UCL	0.0316	
2938												
2939												
2940	**Molybdenum, dissolved (ow-5s)**											
2941												
2942						**General Statistics**							
2943				Number of Valid Observations	16					Number of Distinct Observations	16	
2944												
2945				**Raw Statistics**						**Log-transformed Statistics**		
2946				Minimum	0.0142					Minimum of Log Data	-4.255	
2947				Maximum	0.0294					Maximum of Log Data	-3.527	
2948				Mean	0.0203					Mean of log Data	-3.921	
2949				Median	0.0186					SD of log Data	0.237	
2950				SD	0.00489							
2951				Coefficient of Variation	0.24							
2952				Skewness	0.459							
2953												
2954						**Relevant UCL Statistics**							
2955				**Normal Distribution Test**						**Lognormal Distribution Test**		
2956				Shapiro Wilk Test Statistic	0.91					Shapiro Wilk Test Statistic	0.925	
2957				Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887	
2958				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
2959												
2960				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
2961				95% Student's-t UCL	0.0225					95% H-UCL	0.0228	
2962				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0256	
2963				95% Adjusted-CLT UCL	0.0225					97.5% Chebyshev (MVUE) UCL	0.0279	
2964				95% Modified-t UCL	0.0225					99% Chebyshev (MVUE) UCL	0.0324	
2965												
2966				**Gamma Distribution Test**						**Data Distribution**		
2967				k star (bias corrected)	15.51					**Data appear Normal at 5% Significance Level**		
2968				Theta Star	0.00131							

2969					nu star	496.3						
2970					Approximate Chi Square Value (.05)	445.7		**Nonparametric Statistics**				
2971					Adjusted Level of Significance	0.0335					95% CLT UCL	0.0224
2972					Adjusted Chi Square Value	440.2					95% Jackknife UCL	0.0225
2973											95% Standard Bootstrap UCL	0.0223
2974					Anderson-Darling Test Statistic	0.567					95% Bootstrap-t UCL	0.0227
2975					Anderson-Darling 5% Critical Value	0.737					95% Hall's Bootstrap UCL	0.0224
2976					Kolmogorov-Smirnov Test Statistic	0.189					95% Percentile Bootstrap UCL	0.0223
2977					Kolmogorov-Smirnov 5% Critical Value	0.215					95% BCA Bootstrap UCL	0.0223
2978					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0257
2979											97.5% Chebyshev(Mean, Sd) UCL	0.028
2980					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0325
2981					95% Approximate Gamma UCL	0.0227						
2982					95% Adjusted Gamma UCL	0.0229						
2983												
2984					**Potential UCL to Use**						Use 95% Student's-t UCL	0.0225
2985												
2986												
2987	**Molybdenum, dissolved (park moabi-4)**											
2988												
2989						**General Statistics**						
2990					Number of Valid Observations	1					Number of Distinct Observations	1
2991												
2992												
2993						**Warning: This data set only has 1 observations!**						
2994						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
2995						**The data set for variable Molybdenum, dissolved (park moabi-4) was not processed!**						
2996												
2997						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
2998						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
2999												
3000												
3001												
3002	**Molybdenum, dissolved (pge-6)**											
3003												
3004						**General Statistics**						
3005					Number of Valid Observations	3					Number of Distinct Observations	3
3006												
3007												
3008						**Warning: This data set only has 3 observations!**						
3009						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
3010						**The data set for variable Molybdenum, dissolved (pge-6) was not processed!**						
3011												
3012						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
3013						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
3014												
3015												
3016												
3017	**Molybdenum, dissolved (pge-7)**											
3018												
3019						**General Statistics**						
3020					Number of Valid Observations	2					Number of Distinct Observations	2
3021												

	A	B	C	D	E	F	G	H	I	J	K	L
3022												
3023	Warning: This data set only has 2 observations!											
3024	Data set is too small to compute reliable and meaningful statistics and estimates!											
3025	The data set for variable Molybdenum, dissolved (pge-7) was not processed!											
3026												
3027	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3028	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3029												
3030												
3031												
3032	Molybdenum, dissolved (pge-8)											
3033												
3034	General Statistics											
3035	Number of Valid Observations	3				Number of Distinct Observations	3					
3036												
3037												
3038	Warning: This data set only has 3 observations!											
3039	Data set is too small to compute reliable and meaningful statistics and estimates!											
3040	The data set for variable Molybdenum, dissolved (pge-8) was not processed!											
3041												
3042	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3043	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3044												
3045												
3046												
3047	Molybdenum, dissolved (tw-1)											
3048												
3049	General Statistics											
3050	Number of Valid Observations	4				Number of Distinct Observations	4					
3051												
3052												
3053	Warning: This data set only has 4 observations!											
3054	Data set is too small to compute reliable and meaningful statistics and estimates!											
3055	The data set for variable Molybdenum, dissolved (tw-1) was not processed!											
3056												
3057	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3058	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3059												
3060												
3061												
3062	Molybdenum, dissolved (tw-2d)											
3063												
3064	General Statistics											
3065	Number of Valid Observations	3				Number of Distinct Observations	3					
3066												
3067												
3068	Warning: This data set only has 3 observations!											
3069	Data set is too small to compute reliable and meaningful statistics and estimates!											
3070	The data set for variable Molybdenum, dissolved (tw-2d) was not processed!											
3071												
3072	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3073	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3074												

	A	B	C	D	E	F	G	H	I	J	K	L
3075												
3076												
3077	**Molybdenum, dissolved (tw-2s)**											
3078												
3079	**General Statistics**											
3080					Number of Valid Data	3			Number of Detected Data			2
3081					Number of Distinct Detected Data	2			Number of Non-Detect Data			1
3082									Percent Non-Detects			33.33%
3083												
3084	**Warning: This data set only has 3 observations!**											
3085	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3086	**The data set for variable Molybdenum, dissolved (tw-2s) was not processed!**											
3087												
3088	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3089	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3090												
3091												

1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	Nickel, dissolved (1)											
10												
11					General Statistics							
12					Number of Valid Data	149			Number of Detected Data	53		
13					Number of Distinct Detected Data	50			Number of Non-Detect Data	96		
14									Percent Non-Detects	64.43%		
15												
16					Raw Statistics				Log-transformed Statistics			
17					Minimum Detected	0.001			Minimum Detected	-6.908		
18					Maximum Detected	0.0415			Maximum Detected	-3.182		
19					Mean of Detected	0.0042			Mean of Detected	-5.965		
20					SD of Detected	0.00635			SD of Detected	0.873		
21					Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908		
22					Maximum Non-Detect	0.00628			Maximum Non-Detect	-5.07		
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	138		
25	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	11		
26	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	92.62%		
27												
28					UCL Statistics							
29					Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only			
30					Lilliefors Test Statistic	0.307			Lilliefors Test Statistic	0.142		
31					5% Lilliefors Critical Value	0.122			5% Lilliefors Critical Value	0.122		
32					Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
33												
34					Assuming Normal Distribution				Assuming Lognormal Distribution			
35					DL/2 Substitution Method				DL/2 Substitution Method			
36					Mean	0.00184			Mean	-7		
37					SD	0.00416			SD	0.943		
38					95% DL/2 (t) UCL	0.0024			95% H-Stat (DL/2) UCL	0.00136		
39												
40					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
41					MLE yields a negative mean				Mean in Log Scale	-7.675		
42									SD in Log Scale	1.618		
43									Mean in Original Scale	0.00167		
44									SD in Original Scale	0.00422		
45									95% Percentile Bootstrap UCL	0.0023		
46									95% BCA Bootstrap UCL	0.00251		
47												
48					Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only			
49					k star (bias corrected)	1.1			Data do not follow a Discernable Distribution (0.05)			
50					Theta Star	0.00382						
51					nu star	116.6						
52												
53					A-D Test Statistic	3.641			Nonparametric Statistics			

54				5% A-D Critical Value	0.776				Kaplan-Meier (KM) Method			
55				K-S Test Statistic	0.776				Mean			0.00214
56				5% K-S Critical Value	0.125				SD			0.00405
57				**Data not Gamma Distributed at 5% Significance Level**					SE of Mean			0.0003354
58									95% KM (t) UCL			0.0027
59				**Assuming Gamma Distribution**					95% KM (z) UCL			0.00269
60				Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL			0.00268
61				Minimum	1E-09				95% KM (bootstrap t) UCL			0.00312
62				Maximum	0.0415				95% KM (BCA) UCL			0.0028
63				Mean	0.00744				95% KM (Percentile Bootstrap) UCL			0.00277
64				Median	0.00579				95% KM (Chebyshev) UCL			0.0036
65				SD	0.00668				97.5% KM (Chebyshev) UCL			0.00424
66				k star	0.453				99% KM (Chebyshev) UCL			0.00548
67				Theta star	0.0164							
68				Nu star	135.1				**Potential UCLs to Use**			
69				AppChi2	109.3				95% KM (t) UCL			0.0027
70				95% Gamma Approximate UCL	0.0092				95% KM (% Bootstrap) UCL			0.00277
71				95% Adjusted Gamma UCL	0.00922							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Nickel, dissolved (cw-1d)**											
76												
77									**General Statistics**			
78				Number of Valid Data	8				Number of Detected Data			2
79				Number of Distinct Detected Data	2				Number of Non-Detect Data			6
80									Percent Non-Detects			75.00%
81												
82				**Raw Statistics**					**Log-transformed Statistics**			
83				Minimum Detected	0.00165				Minimum Detected			-6.407
84				Maximum Detected	0.0055				Maximum Detected			-5.203
85				Mean of Detected	0.00358				Mean of Detected			-5.805
86				SD of Detected	0.00272				SD of Detected			0.851
87				Minimum Non-Detect	0.001				Minimum Non-Detect			-6.908
88				Maximum Non-Detect	0.02				Maximum Non-Detect			-3.912
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			8
91	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			0
92	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
93												
94	**Warning: Data set has only 2 Distinct Detected Values.**											
95	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
96	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
97												
98	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
99												
100	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
101	**Those methods will return a 'N/A' value on your output display!**											
102												
103	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
104	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
105												
106												

107	**UCL Statistics**											
108	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
109	Shapiro Wilk Test Statistic				1		Shapiro Wilk Test Statistic					1
110	5% Shapiro Wilk Critical Value				N/A		5% Shapiro Wilk Critical Value					N/A
111	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
112												
113	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
114	DL/2 Substitution Method						DL/2 Substitution Method					
115	Mean				0.00533		Mean					-5.626
116	SD				0.00411		SD					1.075
117	95% DL/2 (t) UCL				0.00809		95% H-Stat (DL/2) UCL					0.042
118												
119	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
120	**MLE method failed to converge properly**						Mean in Log Scale					N/A
121							SD in Log Scale					N/A
122							Mean in Original Scale					N/A
123							SD in Original Scale					N/A
124							95% Percentile Bootstrap UCL					N/A
125							95% BCA Bootstrap UCL					N/A
126												
127	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
128	k star (bias corrected)				N/A		**Data do not follow a Discernable Distribution (0.05)**					
129	Theta Star				N/A							
130	nu star				N/A							
131												
132	A-D Test Statistic				0.359		**Nonparametric Statistics**					
133	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
134	K-S Test Statistic				N/A		Mean					0.00242
135	5% K-S Critical Value				N/A		SD					0.00154
136	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.000974
137							95% KM (t) UCL					0.00427
138	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00402
139	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00525
140	Minimum				N/A		95% KM (bootstrap t) UCL					1.8E+308
141	Maximum				N/A		95% KM (BCA) UCL					0.0055
142	Mean				N/A		95% KM (Percentile Bootstrap) UCL					N/A
143	Median				N/A		95% KM (Chebyshev) UCL					0.00667
144	SD				N/A		97.5% KM (Chebyshev) UCL					0.0085
145	k star				N/A		99% KM (Chebyshev) UCL					0.0121
146	Theta star				N/A							
147	Nu star				N/A		**Potential UCLs to Use**					
148	AppChi2				N/A		95% KM (t) UCL					0.00427
149	95% Gamma Approximate UCL				N/A		95% KM (% Bootstrap) UCL					N/A
150	95% Adjusted Gamma UCL				N/A							
151	**Note: DL/2 is not a recommended method.**											
152												
153												
154	**Nickel, dissolved (cw-1m)**											
155												
156	**General Statistics**											
157	Number of Valid Data				8		Number of Detected Data					2
158	Number of Distinct Detected Data				2		Number of Non-Detect Data					6
159							Percent Non-Detects					75.00%

Raw Statistics		**Log-transformed Statistics**
Minimum Detected	0.00173	Minimum Detected -6.36
Maximum Detected	0.00187	Maximum Detected -6.282
Mean of Detected	0.0018	Mean of Detected -6.321
SD of Detected	9.9E-05	SD of Detected 0.055
Minimum Non-Detect	0.001	Minimum Non-Detect -6.908
Maximum Non-Detect	0.02	Maximum Non-Detect -3.912
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect 8
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected 0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage 100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic 1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**
Assuming Normal Distribution		**Assuming Lognormal Distribution**
DL/2 Substitution Method		DL/2 Substitution Method
Mean	0.00395	Mean -5.928
SD	0.00379	SD 0.973
95% DL/2 (t) UCL	0.00649	95% H-Stat (DL/2) UCL 0.044
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method
MLE method failed to converge properly		Mean in Log Scale N/A
		SD in Log Scale N/A
		Mean in Original Scale N/A
		SD in Original Scale N/A
		95% Percentile Bootstrap UCL N/A
		95% BCA Bootstrap UCL N/A
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**
Theta Star	N/A	
nu star	N/A	
A-D Test Statistic	0.359	**Nonparametric Statistics**
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method

213				K-S Test Statistic	N/A					Mean	0.00178
214				5% K-S Critical Value	N/A					SD	6.6E-05
215	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	5.389E-05
216										95% KM (t) UCL	0.00188
217	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00187
218				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0019
219				Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
220				Maximum	N/A					95% KM (BCA) UCL	0.00187
221				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00187
222				Median	N/A					95% KM (Chebyshev) UCL	0.00201
223				SD	N/A					97.5% KM (Chebyshev) UCL	0.00211
224				k star	N/A					99% KM (Chebyshev) UCL	0.00231
225				Theta star	N/A						
226				Nu star	N/A					**Potential UCLs to Use**	
227				AppChi2	N/A					95% KM (t) UCL	0.00188
228				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.00187
229				95% Adjusted Gamma UCL	N/A						
230	**Warning: Recommended UCL exceeds the maximum observation**										
231	**Note: DL/2 is not a recommended method.**										
232											
233											
234	**Nickel, dissolved (cw-2d)**										
235											
236	**General Statistics**										
237				Number of Valid Data	8					Number of Detected Data	2
238				Number of Distinct Detected Data	2					Number of Non-Detect Data	6
239										Percent Non-Detects	75.00%
240											
241	**Raw Statistics**									**Log-transformed Statistics**	
242				Minimum Detected	0.00142					Minimum Detected	-6.557
243				Maximum Detected	0.0056					Maximum Detected	-5.185
244				Mean of Detected	0.00351					Mean of Detected	-5.871
245				SD of Detected	0.00296					SD of Detected	0.97
246				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
247				Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912
248											
249	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	8
250	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0
251	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%
252											
253	**Warning: Data set has only 2 Distinct Detected Values.**										
254	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**										
255	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**										
256											
257	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**										
258											
259	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**										
260	**Those methods will return a 'N/A' value on your output display!**										
261											
262	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**										
263	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**										
264											
265											

266	**UCL Statistics**											
267	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
268	Shapiro Wilk Test Statistic				1		Shapiro Wilk Test Statistic					1
269	5% Shapiro Wilk Critical Value				N/A		5% Shapiro Wilk Critical Value					N/A
270	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
271												
272	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
273	DL/2 Substitution Method						DL/2 Substitution Method					
274	Mean				0.00532		Mean					-5.643
275	SD				0.00414		SD					1.092
276	95% DL/2 (t) UCL				0.00809		95% H-Stat (DL/2) UCL					0.102
277												
278	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
279	**MLE method failed to converge properly**						Mean in Log Scale					N/A
280							SD in Log Scale					N/A
281							Mean in Original Scale					N/A
282							SD in Original Scale					N/A
283							95% Percentile Bootstrap UCL					N/A
284							95% BCA Bootstrap UCL					N/A
285												
286	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
287	k star (bias corrected)				N/A		**Data do not follow a Discernable Distribution (0.05)**					
288	Theta Star				N/A							
289	nu star				N/A							
290												
291	A-D Test Statistic				0.359		**Nonparametric Statistics**					
292	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
293	K-S Test Statistic				N/A		Mean					0.00226
294	5% K-S Critical Value				N/A		SD					0.00167
295	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.00106
296							95% KM (t) UCL					0.00426
297	**Assuming Gamma Distribution**						95% KM (z) UCL					0.004
298	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00533
299	Minimum				N/A		95% KM (bootstrap t) UCL					1.8E+308
300	Maximum				N/A		95% KM (BCA) UCL					N/A
301	Mean				N/A		95% KM (Percentile Bootstrap) UCL					0.0056
302	Median				N/A		95% KM (Chebyshev) UCL					0.00687
303	SD				N/A		97.5% KM (Chebyshev) UCL					0.00886
304	k star				N/A		99% KM (Chebyshev) UCL					0.0128
305	Theta star				N/A							
306	Nu star				N/A		**Potential UCLs to Use**					
307	AppChi2				N/A		95% KM (t) UCL					0.00426
308	95% Gamma Approximate UCL				N/A		95% KM (% Bootstrap) UCL					0.0056
309	95% Adjusted Gamma UCL				N/A							
310	**Note: DL/2 is not a recommended method.**											
311												
312												
313	**Nickel, dissolved (cw-2m)**											
314												
315	**General Statistics**											
316	Number of Valid Data				8		Number of Detected Data					2
317	Number of Distinct Detected Data				2		Number of Non-Detect Data					6
318							Percent Non-Detects					75.00%

Raw Statistics		**Log-transformed Statistics**
Minimum Detected	0.00117	Minimum Detected	-6.751
Maximum Detected	0.0015	Maximum Detected	-6.502
Mean of Detected	0.00134	Mean of Detected	-6.627
SD of Detected	0.0002334	SD of Detected	0.176
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	8
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00383	Mean	-6.005
SD	0.00387	SD	1.019
95% DL/2 (t) UCL	0.00643	95% H-Stat (DL/2) UCL	0.037
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	0.359	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	

372				K-S Test Statistic	N/A					Mean	0.00128	
373				5% K-S Critical Value	N/A					SD	0.0001556	
374	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.000127	
375										95% KM (t) UCL	0.00152	
376	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00149	
377	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL	0.00157	
378				Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308	
379				Maximum	N/A					95% KM (BCA) UCL	N/A	
380				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0015	
381				Median	N/A					95% KM (Chebyshev) UCL	0.00183	
382				SD	N/A					97.5% KM (Chebyshev) UCL	0.00207	
383				k star	N/A					99% KM (Chebyshev) UCL	0.00254	
384				Theta star	N/A							
385				Nu star	N/A					**Potential UCLs to Use**		
386				AppChi2	N/A					95% KM (t) UCL	0.00152	
387				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.0015	
388				95% Adjusted Gamma UCL	N/A							
389	**Warning: Recommended UCL exceeds the maximum observation**											
390	**Note: DL/2 is not a recommended method.**											
391												
392												
393	**Nickel, dissolved (cw-3d)**											
394												
395	**General Statistics**											
396				Number of Valid Data	8					Number of Detected Data	3	
397				Number of Distinct Detected Data	3					Number of Non-Detect Data	5	
398										Percent Non-Detects	62.50%	
399												
400	**Raw Statistics**									**Log-transformed Statistics**		
401				Minimum Detected	0.00301					Minimum Detected	-5.806	
402				Maximum Detected	0.0076					Maximum Detected	-4.88	
403				Mean of Detected	0.0056					Mean of Detected	-5.256	
404				SD of Detected	0.00235					SD of Detected	0.487	
405				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
406				Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912	
407												
408	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	8	
409	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
410	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
411												
412	**Warning: There are only 3 Distinct Detected Values in this data set**											
413	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
414	**Those methods will return a 'N/A' value on your output display!**											
415												
416	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
417	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
418												
419												
420	**UCL Statistics**											
421	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
422				Shapiro Wilk Test Statistic	0.952					Shapiro Wilk Test Statistic	0.905	
423				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
424	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		

425												
426	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
427				DL/2 Substitution Method						DL/2 Substitution Method		
428				Mean	0.00623					Mean		-5.397
429				SD	0.00381					SD		1.044
430				95% DL/2 (t) UCL	0.00878					95% H-Stat (DL/2) UCL		0.0624
431												
432				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
433	**MLE method failed to converge properly**									Mean in Log Scale		-5.663
434										SD in Log Scale		0.575
435										Mean in Original Scale		0.004
436										SD in Original Scale		0.00223
437										95% Percentile Bootstrap UCL		0.00522
438										95% BCA Bootstrap UCL		0.0053
439												
440	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
441				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
442				Theta Star	N/A							
443				nu star	N/A							
444												
445				A-D Test Statistic	0.358		**Nonparametric Statistics**					
446				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
447				K-S Test Statistic	N/A					Mean		0.00457
448				5% K-S Critical Value	N/A					SD		0.00196
449	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.00107
450										95% KM (t) UCL		0.0066
451	**Assuming Gamma Distribution**									95% KM (z) UCL		0.00633
452				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.007
453				Minimum	N/A					95% KM (bootstrap t) UCL		0.00566
454				Maximum	N/A					95% KM (BCA) UCL		0.0076
455				Mean	N/A					95% KM (Percentile Bootstrap) UCL		0.0076
456				Median	N/A					95% KM (Chebyshev) UCL		0.00924
457				SD	N/A					97.5% KM (Chebyshev) UCL		0.0113
458				k star	N/A					99% KM (Chebyshev) UCL		0.0152
459				Theta star	N/A							
460				Nu star	N/A		**Potential UCLs to Use**					
461				AppChi2	N/A					95% KM (t) UCL		0.0066
462				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL		0.0076
463				95% Adjusted Gamma UCL	N/A							
464	**Note: DL/2 is not a recommended method.**											
465												
466												
467	**Nickel, dissolved (cw-3m)**											
468												
469	**General Statistics**											
470				Number of Valid Data	8					Number of Detected Data		3
471				Number of Distinct Detected Data	3					Number of Non-Detect Data		5
472										Percent Non-Detects		62.50%
473												
474	**Raw Statistics**						**Log-transformed Statistics**					
475				Minimum Detected	0.00121					Minimum Detected		-6.717
476				Maximum Detected	0.0057					Maximum Detected		-5.167
477				Mean of Detected	0.00397					Mean of Detected		-5.728

478					SD of Detected	0.00242					SD of Detected	0.859
479					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
480					Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912
481												
482	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
483	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
484	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
485												
486	**Warning: There are only 3 Distinct Detected Values in this data set**											
487	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
488	**Those methods will return a 'N/A' value on your output display!**											
489												
490	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
491	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
492												
493												
494	**UCL Statistics**											
495	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
496					Shapiro Wilk Test Statistic	0.864					Shapiro Wilk Test Statistic	0.813
497					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
498	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
499												
500	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
501					DL/2 Substitution Method						DL/2 Substitution Method	
502					Mean	0.00561					Mean	-5.574
503					SD	0.00402					SD	1.111
504					95% DL/2 (t) UCL	0.00831					95% H-Stat (DL/2) UCL	0.0469
505												
506					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
507	**MLE method failed to converge properly**										Mean in Log Scale	-6.421
508											SD in Log Scale	0.986
509											Mean in Original Scale	0.00242
510											SD in Original Scale	0.00212
511											95% Percentile Bootstrap UCL	0.0036
512											95% BCA Bootstrap UCL	0.00368
513												
514	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
515					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
516					Theta Star	N/A						
517					nu star	N/A						
518												
519					A-D Test Statistic	0.5	**Nonparametric Statistics**					
520					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
521					K-S Test Statistic	N/A					Mean	0.00287
522					5% K-S Critical Value	N/A					SD	0.00204
523	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00112
524											95% KM (t) UCL	0.00498
525	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0047
526					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00555
527					Minimum	N/A					95% KM (bootstrap t) UCL	0.00415
528					Maximum	N/A					95% KM (BCA) UCL	0.0057
529					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0057
530					Median	N/A					95% KM (Chebyshev) UCL	0.00774

531					SD	N/A					97.5% KM (Chebyshev) UCL	0.00984
532					k star	N/A					99% KM (Chebyshev) UCL	0.014
533					Theta star	N/A						
534					Nu star	N/A	**Potential UCLs to Use**					
535					AppChi2	N/A					95% KM (t) UCL	0.00498
536					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0057
537					95% Adjusted Gamma UCL	N/A						
538	**Note: DL/2 is not a recommended method.**											
539												
540												
541	**Nickel, dissolved (cw-4d)**											
542												
543	**General Statistics**											
544					Number of Valid Data	8					Number of Detected Data	2
545					Number of Distinct Detected Data	2					Number of Non-Detect Data	6
546											Percent Non-Detects	75.00%
547												
548	**Raw Statistics**						**Log-transformed Statistics**					
549					Minimum Detected	0.0016					Minimum Detected	-6.438
550					Maximum Detected	0.0056					Maximum Detected	-5.185
551					Mean of Detected	0.0036					Mean of Detected	-5.811
552					SD of Detected	0.00283					SD of Detected	0.886
553					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
554					Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912
555												
556	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
557	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
558	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
559												
560	**Warning: Data set has only 2 Distinct Detected Values.**											
561	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
562	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
563												
564	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
565												
566	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
567	**Those methods will return a 'N/A' value on your output display!**											
568												
569	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
570	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
571												
572												
573	**UCL Statistics**											
574	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
575					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
576					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
577	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
578												
579	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
580					DL/2 Substitution Method						DL/2 Substitution Method	
581					Mean	0.00534					Mean	-5.628
582					SD	0.00412					SD	1.079
583					95% DL/2 (t) UCL	0.0081					95% H-Stat (DL/2) UCL	0.095

584												
585					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
586					**MLE method failed to converge properly**						Mean in Log Scale	N/A
587											SD in Log Scale	N/A
588											Mean in Original Scale	N/A
589											SD in Original Scale	N/A
590											95% Percentile Bootstrap UCL	N/A
591											95% BCA Bootstrap UCL	N/A
592												
593					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
594					k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**	
595					Theta Star	N/A						
596					nu star	N/A						
597												
598					A-D Test Statistic	0.359					**Nonparametric Statistics**	
599					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
600					K-S Test Statistic	N/A					Mean	0.0024
601					5% K-S Critical Value	N/A					SD	0.0016
602					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00101
603											95% KM (t) UCL	0.00432
604					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00406
605					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00534
606					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
607					Maximum	N/A					95% KM (BCA) UCL	0.0056
608					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0056
609					Median	N/A					95% KM (Chebyshev) UCL	0.00681
610					SD	N/A					97.5% KM (Chebyshev) UCL	0.00872
611					k star	N/A					99% KM (Chebyshev) UCL	0.0125
612					Theta star	N/A						
613					Nu star	N/A					**Potential UCLs to Use**	
614					AppChi2	N/A					95% KM (t) UCL	0.00432
615					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.0056
616					95% Adjusted Gamma UCL	N/A						
617	**Note: DL/2 is not a recommended method.**											
618												
619												
620	**Nickel, dissolved (cw-4m)**											
621												
622					**General Statistics**							
623					Number of Valid Data	8					Number of Detected Data	1
624					Number of Distinct Detected Data	1					Number of Non-Detect Data	7
625											Percent Non-Detects	87.50%
626												
627	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
628	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
629												
630	**The data set for variable Nickel, dissolved (cw-4m) was not processed!**											
631												
632												
633												
634	**Nickel, dissolved (mw-1)**											
635												
636					**General Statistics**							

637				Number of Valid Data	5					Number of Detected Data	4	
638				Number of Distinct Detected Data	4					Number of Non-Detect Data	1	
639										Percent Non-Detects	20.00%	
640												
641				**Raw Statistics**						**Log-transformed Statistics**		
642				Minimum Detected	0.00671					Minimum Detected	-5.004	
643				Maximum Detected	0.023					Maximum Detected	-3.772	
644				Mean of Detected	0.0119					Mean of Detected	-4.559	
645				SD of Detected	0.00754					SD of Detected	0.55	
646				Minimum Non-Detect	0.025					Minimum Non-Detect	-3.689	
647				Maximum Non-Detect	0.025					Maximum Non-Detect	-3.689	
648												
649												
650				**Warning: There are only 4 Distinct Detected Values in this data**								
651				**Note: It should be noted that even though bootstrap may be performed on this data set**								
652				**the resulting calculations may not be reliable enough tp draw conclusions**								
653												
654				**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**								
655												
656												
657				**UCL Statistics**								
658				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
659				Shapiro Wilk Test Statistic	0.784					Shapiro Wilk Test Statistic	0.87	
660				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748	
661				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
662												
663				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
664				DL/2 Substitution Method						DL/2 Substitution Method		
665				Mean	0.012					Mean	-4.524	
666				SD	0.00654					SD	0.483	
667				95% DL/2 (t) UCL	0.0182					95% H-Stat (DL/2) UCL	0.0752	
668												
669				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
670				**MLE method failed to converge properly**						Mean in Log Scale	-4.559	
671										SD in Log Scale	0.476	
672										Mean in Original Scale	0.0116	
673										SD in Original Scale	0.00656	
674										95% Percentile Bootstrap UCL	0.0167	
675										95% BCA Bootstrap UCL	0.0178	
676												
677				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
678				k star (bias corrected)	1.2					**Data appear Normal at 5% Significance Level**		
679				Theta Star	0.0099							
680				nu star	9.601							
681												
682				A-D Test Statistic	0.483					**Nonparametric Statistics**		
683				5% A-D Critical Value	0.659					Kaplan-Meier (KM) Method		
684				K-S Test Statistic	0.659					Mean	0.0119	
685				5% K-S Critical Value	0.396					SD	0.00653	
686				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00377	
687										95% KM (t) UCL	0.0199	
688				**Assuming Gamma Distribution**						95% KM (z) UCL	0.0181	
689				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0202	

690					Minimum	0.00671				95% KM (bootstrap t) UCL		0.0377
691					Maximum	0.023				95% KM (BCA) UCL		0.0178
692					Mean	0.0119				95% KM (Percentile Bootstrap) UCL		0.0179
693					Median	0.01				95% KM (Chebyshev) UCL		0.0283
694					SD	0.00653				97.5% KM (Chebyshev) UCL		0.0354
695					k star	2.185				99% KM (Chebyshev) UCL		0.0494
696					Theta star	0.00544						
697					Nu star	21.85				**Potential UCLs to Use**		
698					AppChi2	12.22				95% KM (t) UCL		0.0199
699					95% Gamma Approximate UCL	0.0212				95% KM (Percentile Bootstrap) UCL		0.0179
700					95% Adjusted Gamma UCL	N/A						
701	**Note: DL/2 is not a recommended method.**											
702												
703												
704	**Nickel, dissolved (mw-10)**											
705												
706						**General Statistics**						
707					Number of Valid Data	39				Number of Detected Data		20
708					Number of Distinct Detected Data	17				Number of Non-Detect Data		19
709										Percent Non-Detects		48.72%
710												
711					**Raw Statistics**					**Log-transformed Statistics**		
712					Minimum Detected	0.00165				Minimum Detected		-6.407
713					Maximum Detected	0.033				Maximum Detected		-3.411
714					Mean of Detected	0.00592				Mean of Detected		-5.535
715					SD of Detected	0.0074				SD of Detected		0.816
716					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
717					Maximum Non-Detect	0.0278				Maximum Non-Detect		-3.583
718												
719	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		38
720	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
721	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		97.44%
722												
723						**UCL Statistics**						
724					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
725					Shapiro Wilk Test Statistic	0.591				Shapiro Wilk Test Statistic		0.88
726					5% Shapiro Wilk Critical Value	0.905				5% Shapiro Wilk Critical Value		0.905
727					**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**		
728												
729					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
730					DL/2 Substitution Method					DL/2 Substitution Method		
731					Mean	0.00756				Mean		-5.206
732					SD	0.00627				SD		0.827
733					95% DL/2 (t) UCL	0.00925				95% H-Stat (DL/2) UCL		0.0137
734												
735					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
736					**MLE method failed to converge properly**					Mean in Log Scale		-5.636
737										SD in Log Scale		0.669
738										Mean in Original Scale		0.00477
739										SD in Original Scale		0.00549
740										95% Percentile Bootstrap UCL		0.00627
741										95% BCA Bootstrap UCL		0.0069
742												

	A	B	C	D	E	F	G	H	I	J	K	L
743	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
744					k star (bias corrected)	1.203	**Data do not follow a Discernable Distribution (0.05)**					
745					Theta Star	0.00492						
746					nu star	48.11						
747												
748					A-D Test Statistic	1.483	**Nonparametric Statistics**					
749					5% A-D Critical Value	0.76					Kaplan-Meier (KM) Method	
750					K-S Test Statistic	0.76					Mean	0.00486
751					5% K-S Critical Value	0.198					SD	0.00569
752	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00103
753											95% KM (t) UCL	0.00661
754	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00656
755					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0066
756					Minimum	0.000806					95% KM (bootstrap t) UCL	0.00791
757					Maximum	0.033					95% KM (BCA) UCL	0.00692
758					Mean	0.0064					95% KM (Percentile Bootstrap) UCL	0.00665
759					Median	0.00463					95% KM (Chebyshev) UCL	0.00937
760					SD	0.00587					97.5% KM (Chebyshev) UCL	0.0113
761					k star	1.594					99% KM (Chebyshev) UCL	0.0151
762					Theta star	0.00402						
763					Nu star	124.3	**Potential UCLs to Use**					
764					AppChi2	99.57					95% KM (t) UCL	0.00661
765					95% Gamma Approximate UCL	0.00799					95% KM (% Bootstrap) UCL	0.00665
766					95% Adjusted Gamma UCL	0.00806						
767	**Note: DL/2 is not a recommended method.**											
768												
769												
770	**Nickel, dissolved (mw-11)**											
771												
772	**General Statistics**											
773					Number of Valid Data	35					Number of Detected Data	16
774					Number of Distinct Detected Data	15					Number of Non-Detect Data	19
775											Percent Non-Detects	54.29%
776												
777	**Raw Statistics**						**Log-transformed Statistics**					
778					Minimum Detected	0.00096					Minimum Detected	-6.949
779					Maximum Detected	0.0203					Maximum Detected	-3.897
780					Mean of Detected	0.00689					Mean of Detected	-5.352
781					SD of Detected	0.00579					SD of Detected	0.95
782					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
783					Maximum Non-Detect	0.0278					Maximum Non-Detect	-3.583
784												
785	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	35
786	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
787	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
788												
789	**UCL Statistics**											
790	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
791					Shapiro Wilk Test Statistic	0.88					Shapiro Wilk Test Statistic	0.961
792					5% Shapiro Wilk Critical Value	0.887					5% Shapiro Wilk Critical Value	0.887
793	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
794												
795	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					

796				DL/2 Substitution Method						DL/2 Substitution Method		
797				Mean	0.00744					Mean		-5.356
798				SD	0.00549					SD		1.149
799				95% DL/2 (t) UCL	0.00901					95% H-Stat (DL/2) UCL		0.0142
800												
801				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
802				**MLE method failed to converge properly**						Mean in Log Scale		-5.822
803										SD in Log Scale		0.96
804										Mean in Original Scale		0.0046
805										SD in Original Scale		0.00467
806										95% Percentile Bootstrap UCL		0.00589
807										95% BCA Bootstrap UCL		0.0061
808												
809				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
810				k star (bias corrected)	1.247					**Data appear Gamma Distributed at 5% Significance Level**		
811				Theta Star	0.00552							
812				nu star	39.91							
813												
814				A-D Test Statistic	0.202					**Nonparametric Statistics**		
815				5% A-D Critical Value	0.755					Kaplan-Meier (KM) Method		
816				K-S Test Statistic	0.755					Mean		0.0051
817				5% K-S Critical Value	0.219					SD		0.00518
818				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		0.00109
819										95% KM (t) UCL		0.00695
820				**Assuming Gamma Distribution**						95% KM (z) UCL		0.0069
821				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00693
822				Minimum	0.00096					95% KM (bootstrap t) UCL		0.00737
823				Maximum	0.0203					95% KM (BCA) UCL		0.00713
824				Mean	0.00726					95% KM (Percentile Bootstrap) UCL		0.00705
825				Median	0.00652					95% KM (Chebyshev) UCL		0.00987
826				SD	0.0049					97.5% KM (Chebyshev) UCL		0.0119
827				k star	1.822					99% KM (Chebyshev) UCL		0.016
828				Theta star	0.00398							
829				Nu star	127.5					**Potential UCLs to Use**		
830				AppChi2	102.5					95% KM (t) UCL		0.00695
831				95% Gamma Approximate UCL	0.00903							
832				95% Adjusted Gamma UCL	0.00913							
833	**Note: DL/2 is not a recommended method.**											
834												
835												
836	**Nickel, dissolved (mw-12)**											
837												
838				**General Statistics**								
839				Number of Valid Data	41					Number of Detected Data		20
840				Number of Distinct Detected Data	20					Number of Non-Detect Data		21
841										Percent Non-Detects		51.22%
842												
843				**Raw Statistics**						**Log-transformed Statistics**		
844				Minimum Detected	0.0013					Minimum Detected		-6.645
845				Maximum Detected	0.0179					Maximum Detected		-4.023
846				Mean of Detected	0.00552					Mean of Detected		-5.466
847				SD of Detected	0.00457					SD of Detected		0.724
848				Minimum Non-Detect	0.005					Minimum Non-Detect		-5.298

849				Maximum Non-Detect	0.0278					Maximum Non-Detect	-3.583	
850												
851	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	41	
852	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
853	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
854												
855	**UCL Statistics**											
856	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
857				Shapiro Wilk Test Statistic	0.794					Shapiro Wilk Test Statistic	0.962	
858				5% Shapiro Wilk Critical Value	0.905					5% Shapiro Wilk Critical Value	0.905	
859	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
860												
861	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
862				DL/2 Substitution Method						DL/2 Substitution Method		
863				Mean	0.00731					Mean	-5.174	
864				SD	0.00476					SD	0.763	
865				95% DL/2 (t) UCL	0.00856					95% H-Stat (DL/2) UCL	0.0123	
866												
867				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
868	**MLE method failed to converge properly**									Mean in Log Scale	-5.56	
869										SD in Log Scale	0.607	
870										Mean in Original Scale	0.00469	
871										SD in Original Scale	0.00352	
872										95% Percentile Bootstrap UCL	0.00564	
873										95% BCA Bootstrap UCL	0.00582	
874												
875	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
876				k star (bias corrected)	1.759		**Data appear Gamma Distributed at 5% Significance Level**					
877				Theta Star	0.00314							
878				nu star	70.35							
879												
880				A-D Test Statistic	0.621		**Nonparametric Statistics**					
881				5% A-D Critical Value	0.752					Kaplan-Meier (KM) Method		
882				K-S Test Statistic	0.752					Mean	0.00492	
883				5% K-S Critical Value	0.196					SD	0.00408	
884	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.0008302	
885										95% KM (t) UCL	0.00632	
886	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00628	
887				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00632	
888				Minimum	0.0013					95% KM (bootstrap t) UCL	0.00689	
889				Maximum	0.0179					95% KM (BCA) UCL	0.00627	
890				Mean	0.0059					95% KM (Percentile Bootstrap) UCL	0.00639	
891				Median	0.0053					95% KM (Chebyshev) UCL	0.00854	
892				SD	0.00349					97.5% KM (Chebyshev) UCL	0.0101	
893				k star	3.02					99% KM (Chebyshev) UCL	0.0132	
894				Theta star	0.00196							
895				Nu star	247.6		**Potential UCLs to Use**					
896				AppChi2	212.2					95% KM (t) UCL	0.00632	
897				95% Gamma Approximate UCL	0.00689							
898				95% Adjusted Gamma UCL	0.00693							
899	**Note: DL/2 is not a recommended method.**											
900												
901												

902	**Nickel, dissolved (mw-13)**											
903												
904	**General Statistics**											
905					Number of Valid Data	27				Number of Detected Data		19
906					Number of Distinct Detected Data	18				Number of Non-Detect Data		8
907										Percent Non-Detects		29.63%
908												
909	**Raw Statistics**									**Log-transformed Statistics**		
910					Minimum Detected	0.0035				Minimum Detected		-5.655
911					Maximum Detected	0.168				Maximum Detected		-1.784
912					Mean of Detected	0.0169				Mean of Detected		-4.735
913					SD of Detected	0.0369				SD of Detected		0.875
914					Minimum Non-Detect	0.02				Minimum Non-Detect		-3.912
915					Maximum Non-Detect	0.0278				Maximum Non-Detect		-3.583
916												
917	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		26
918	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
919	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		96.30%
920												
921	**UCL Statistics**											
922	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
923					Shapiro Wilk Test Statistic	0.347				Shapiro Wilk Test Statistic		0.784
924					5% Shapiro Wilk Critical Value	0.901				5% Shapiro Wilk Critical Value		0.901
925	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**		
926												
927	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
928					DL/2 Substitution Method					DL/2 Substitution Method		
929					Mean	0.0154				Mean		-4.654
930					SD	0.0308				SD		0.743
931					95% DL/2 (t) UCL	0.0255				95% H-Stat (DL/2) UCL		0.0184
932												
933					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
934	**MLE method failed to converge properly**									Mean in Log Scale		-4.771
935										SD in Log Scale		0.758
936										Mean in Original Scale		0.0144
937										SD in Original Scale		0.031
938										95% Percentile Bootstrap UCL		0.0259
939										95% BCA Bootstrap UCL		0.0323
940												
941	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
942					k star (bias corrected)	0.786				**Data do not follow a Discernable Distribution (0.05)**		
943					Theta Star	0.0215						
944					nu star	29.88						
945												
946					A-D Test Statistic	2.757				**Nonparametric Statistics**		
947					5% A-D Critical Value	0.773				Kaplan-Meier (KM) Method		
948					K-S Test Statistic	0.773				Mean		0.0143
949					5% K-S Critical Value	0.205				SD		0.0305
950	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.00605
951										95% KM (t) UCL		0.0246
952	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0242
953					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.0245
954					Minimum	0.0035				95% KM (bootstrap t) UCL		0.071

955					Maximum	0.168					95% KM (BCA) UCL	0.027
956					Mean	0.0169					95% KM (Percentile Bootstrap) UCL	0.0261
957					Median	0.01					95% KM (Chebyshev) UCL	0.0407
958					SD	0.0307					97.5% KM (Chebyshev) UCL	0.0521
959					k star	1.111					99% KM (Chebyshev) UCL	0.0745
960					Theta star	0.0152						
961					Nu star	60					**Potential UCLs to Use**	
962					AppChi2	43.18					95% KM (BCA) UCL	0.027
963					95% Gamma Approximate UCL	0.0235						
964					95% Adjusted Gamma UCL	0.024						
965	**Note: DL/2 is not a recommended method.**											
966												
967												
968	**Nickel, dissolved (mw-14)**											
969												
970					**General Statistics**							
971					Number of Valid Data	26					Number of Detected Data	17
972					Number of Distinct Detected Data	14					Number of Non-Detect Data	9
973											Percent Non-Detects	34.62%
974												
975					**Raw Statistics**						**Log-transformed Statistics**	
976					Minimum Detected	0.0013					Minimum Detected	-6.645
977					Maximum Detected	0.0397					Maximum Detected	-3.226
978					Mean of Detected	0.011					Mean of Detected	-5.011
979					SD of Detected	0.0109					SD of Detected	1.082
980					Minimum Non-Detect	0.02					Minimum Non-Detect	-3.912
981					Maximum Non-Detect	0.0278					Maximum Non-Detect	-3.583
982												
983	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	24
984	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
985	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	92.31%
986												
987					**UCL Statistics**							
988					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
989					Shapiro Wilk Test Statistic	0.832					Shapiro Wilk Test Statistic	0.948
990					5% Shapiro Wilk Critical Value	0.892					5% Shapiro Wilk Critical Value	0.892
991					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
992												
993					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
994					DL/2 Substitution Method						DL/2 Substitution Method	
995					Mean	0.0113					Mean	-4.814
996					SD	0.00876					SD	0.912
997					95% DL/2 (t) UCL	0.0142					95% H-Stat (DL/2) UCL	0.0262
998												
999					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1000					**MLE method failed to converge properly**						Mean in Log Scale	-5.102
1001											SD in Log Scale	0.927
1002											Mean in Original Scale	0.00919
1003											SD in Original Scale	0.00922
1004											95% Percentile Bootstrap UCL	0.0124
1005											95% BCA Bootstrap UCL	0.0128
1006												
1007					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	

1008				k star (bias corrected)	0.977	**Data appear Gamma Distributed at 5% Significance Level**						
1009				Theta Star	0.0112							
1010				nu star	33.22							
1011												
1012				A-D Test Statistic	0.412	**Nonparametric Statistics**						
1013				5% A-D Critical Value	0.763	Kaplan-Meier (KM) Method						
1014				K-S Test Statistic	0.763	Mean	0.00975					
1015				5% K-S Critical Value	0.214	SD	0.00939					
1016	**Data appear Gamma Distributed at 5% Significance Level**					SE of Mean	0.0021					
1017						95% KM (t) UCL	0.0133					
1018	**Assuming Gamma Distribution**					95% KM (z) UCL	0.0132					
1019	Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.0133					
1020				Minimum	0.0013	95% KM (bootstrap t) UCL	0.014					
1021				Maximum	0.0397	95% KM (BCA) UCL	0.0134					
1022				Mean	0.0111	95% KM (Percentile Bootstrap) UCL	0.0133					
1023				Median	0.011	95% KM (Chebyshev) UCL	0.0189					
1024				SD	0.00904	97.5% KM (Chebyshev) UCL	0.0228					
1025				k star	1.409	99% KM (Chebyshev) UCL	0.0306					
1026				Theta star	0.00788							
1027				Nu star	73.27	**Potential UCLs to Use**						
1028				AppChi2	54.56	95% KM (BCA) UCL	0.0134					
1029				95% Gamma Approximate UCL	0.0149							
1030				95% Adjusted Gamma UCL	0.0152							
1031	**Note: DL/2 is not a recommended method.**											
1032												
1033												
1034	**Nickel, dissolved (mw-15)**											
1035												
1036	**General Statistics**											
1037				Number of Valid Data	24	Number of Detected Data	14					
1038				Number of Distinct Detected Data	11	Number of Non-Detect Data	10					
1039						Percent Non-Detects	41.67%					
1040												
1041	**Raw Statistics**					**Log-transformed Statistics**						
1042				Minimum Detected	0.0014	Minimum Detected	-6.571					
1043				Maximum Detected	0.028	Maximum Detected	-3.576					
1044				Mean of Detected	0.00618	Mean of Detected	-5.509					
1045				SD of Detected	0.00719	SD of Detected	0.882					
1046				Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912					
1047				Maximum Non-Detect	0.0278	Maximum Non-Detect	-3.583					
1048												
1049	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect	23					
1050	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected	1					
1051	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage	95.83%					
1052												
1053	**UCL Statistics**											
1054	**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**						
1055				Shapiro Wilk Test Statistic	0.665	Shapiro Wilk Test Statistic	0.897					
1056				5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874					
1057	**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**						
1058												
1059	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
1060				DL/2 Substitution Method		DL/2 Substitution Method						

1061					Mean	0.00877					Mean	-5.045
1062					SD	0.0063					SD	0.871
1063					95% DL/2 (t) UCL	0.011					95% H-Stat (DL/2) UCL	0.0213
1064												
1065					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1066					**MLE method failed to converge properly**						Mean in Log Scale	-5.559
1067											SD in Log Scale	0.726
1068											Mean in Original Scale	0.00525
1069											SD in Original Scale	0.00563
1070											95% Percentile Bootstrap UCL	0.00728
1071											95% BCA Bootstrap UCL	0.00795
1072												
1073					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
1074					k star (bias corrected)	1.088					**Data appear Lognormal at 5% Significance Level**	
1075					Theta Star	0.00568						
1076					nu star	30.47						
1077												
1078					A-D Test Statistic	0.996					**Nonparametric Statistics**	
1079					5% A-D Critical Value	0.754					Kaplan-Meier (KM) Method	
1080					K-S Test Statistic	0.754					Mean	0.00549
1081					5% K-S Critical Value	0.234					SD	0.00581
1082					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00139
1083											95% KM (t) UCL	0.00786
1084					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00776
1085					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00786
1086					Minimum	0.0014					95% KM (bootstrap t) UCL	0.00913
1087					Maximum	0.028					95% KM (BCA) UCL	0.00841
1088					Mean	0.00623					95% KM (Percentile Bootstrap) UCL	0.00787
1089					Median	0.00509					95% KM (Chebyshev) UCL	0.0115
1090					SD	0.00548					97.5% KM (Chebyshev) UCL	0.0141
1091					k star	1.861					99% KM (Chebyshev) UCL	0.0193
1092					Theta star	0.00335						
1093					Nu star	89.35					**Potential UCLs to Use**	
1094					AppChi2	68.56					95% KM (t) UCL	0.00786
1095					95% Gamma Approximate UCL	0.00812					95% KM (% Bootstrap) UCL	0.00787
1096					95% Adjusted Gamma UCL	0.00827						
1097	**Note: DL/2 is not a recommended method.**											
1098												
1099												
1100	**Nickel, dissolved (mw-19)**											
1101												
1102							**General Statistics**					
1103					Number of Valid Data	22					Number of Detected Data	10
1104					Number of Distinct Detected Data	10					Number of Non-Detect Data	12
1105											Percent Non-Detects	54.55%
1106												
1107					**Raw Statistics**						**Log-transformed Statistics**	
1108					Minimum Detected	0.0012					Minimum Detected	-6.725
1109					Maximum Detected	0.0202					Maximum Detected	-3.902
1110					Mean of Detected	0.00566					Mean of Detected	-5.589
1111					SD of Detected	0.00588					SD of Detected	0.947
1112					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
1113					Maximum Non-Detect	0.0278					Maximum Non-Detect	-3.583

	A	B	C	D	E	F	G	H	I	J	K	L
1114												
1115	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	22
1116	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1117	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1118												
1119	**UCL Statistics**											
1120	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1121	Shapiro Wilk Test Statistic					0.77	Shapiro Wilk Test Statistic					0.943
1122	5% Shapiro Wilk Critical Value					0.842	5% Shapiro Wilk Critical Value					0.842
1123	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1124												
1125	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1126	DL/2 Substitution Method						DL/2 Substitution Method					
1127	Mean					0.00871	Mean					-5.025
1128	SD					0.00527	SD					0.881
1129	95% DL/2 (t) UCL					0.0106	95% H-Stat (DL/2) UCL					0.0269
1130												
1131	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1132	**MLE method failed to converge properly**						Mean in Log Scale					-5.686
1133							SD in Log Scale					0.745
1134							Mean in Original Scale					0.00454
1135							SD in Original Scale					0.00427
1136							95% Percentile Bootstrap UCL					0.00607
1137							95% BCA Bootstrap UCL					0.00673
1138												
1139	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1140	k star (bias corrected)					1.011	**Data appear Gamma Distributed at 5% Significance Level**					
1141	Theta Star					0.0056						
1142	nu star					20.22						
1143												
1144	A-D Test Statistic					0.369	**Nonparametric Statistics**					
1145	5% A-D Critical Value					0.742	Kaplan-Meier (KM) Method					
1146	K-S Test Statistic					0.742	Mean					0.00503
1147	5% K-S Critical Value					0.272	SD					0.00502
1148	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00148
1149							95% KM (t) UCL					0.00757
1150	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00746
1151	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00759
1152	Minimum					0.0002171	95% KM (bootstrap t) UCL					0.00973
1153	Maximum					0.0202	95% KM (BCA) UCL					0.00773
1154	Mean					0.00578	95% KM (Percentile Bootstrap) UCL					0.00757
1155	Median					0.00472	95% KM (Chebyshev) UCL					0.0115
1156	SD					0.00473	97.5% KM (Chebyshev) UCL					0.0143
1157	k star					1.286	99% KM (Chebyshev) UCL					0.0197
1158	Theta star					0.00449						
1159	Nu star					56.59	**Potential UCLs to Use**					
1160	AppChi2					40.3	95% KM (t) UCL					0.00757
1161	95% Gamma Approximate UCL					0.00812						
1162	95% Adjusted Gamma UCL					0.00833						
1163	**Note: DL/2 is not a recommended method.**											
1164												
1165												
1166	**Nickel, dissolved (mw-20-100)**											

1167												
1168	**General Statistics**											
1169					Number of Valid Data	23				Number of Detected Data		13
1170					Number of Distinct Detected Data	11				Number of Non-Detect Data		10
1171										Percent Non-Detects		43.48%
1172												
1173	**Raw Statistics**							**Log-transformed Statistics**				
1174					Minimum Detected	0.0011				Minimum Detected		-6.812
1175					Maximum Detected	0.13				Maximum Detected		-2.04
1176					Mean of Detected	0.0161				Mean of Detected		-5.094
1177					SD of Detected	0.0346				SD of Detected		1.241
1178					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
1179					Maximum Non-Detect	0.0278				Maximum Non-Detect		-3.583
1180												
1181	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		22
1182	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
1183	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		95.65%
1184												
1185	**UCL Statistics**											
1186	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
1187					Shapiro Wilk Test Statistic	0.439				Shapiro Wilk Test Statistic		0.926
1188					5% Shapiro Wilk Critical Value	0.866				5% Shapiro Wilk Critical Value		0.866
1189	**Data not Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
1190												
1191	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
1192					DL/2 Substitution Method					DL/2 Substitution Method		
1193					Mean	0.0139				Mean		-4.87
1194					SD	0.0258				SD		1.008
1195					95% DL/2 (t) UCL	0.0232				95% H-Stat (DL/2) UCL		0.0218
1196												
1197					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1198	**MLE method failed to converge properly**									Mean in Log Scale		-5.24
1199										SD in Log Scale		1.014
1200										Mean in Original Scale		0.0113
1201										SD in Original Scale		0.0262
1202										95% Percentile Bootstrap UCL		0.022
1203										95% BCA Bootstrap UCL		0.0279
1204												
1205	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
1206					k star (bias corrected)	0.541		**Data Follow Appr. Gamma Distribution at 5% Significance Level**				
1207					Theta Star	0.0297						
1208					nu star	14.05						
1209												
1210					A-D Test Statistic	1.245		**Nonparametric Statistics**				
1211					5% A-D Critical Value	0.779				Kaplan-Meier (KM) Method		
1212					K-S Test Statistic	0.779				Mean		0.0116
1213					5% K-S Critical Value	0.248				SD		0.0257
1214	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean		0.00566
1215										95% KM (t) UCL		0.0214
1216	**Assuming Gamma Distribution**									95% KM (z) UCL		0.021
1217					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.0212
1218					Minimum	1E-09				95% KM (bootstrap t) UCL		0.0516
1219					Maximum	0.13				95% KM (BCA) UCL		0.0228

1220					Mean	0.0144				95% KM (Percentile Bootstrap) UCL		0.0221
1221					Median	0.005				95% KM (Chebyshev) UCL		0.0363
1222					SD	0.0272				97.5% KM (Chebyshev) UCL		0.047
1223					k star	0.249				99% KM (Chebyshev) UCL		0.068
1224					Theta star	0.0579						
1225					Nu star	11.44				**Potential UCLs to Use**		
1226					AppChi2	4.86				95% KM (BCA) UCL		0.0228
1227					95% Gamma Approximate UCL	0.0339						
1228					95% Adjusted Gamma UCL	0.0362						
1229	**Note: DL/2 is not a recommended method.**											
1230												
1231												
1232	**Nickel, dissolved (mw-20-130)**											
1233												
1234						**General Statistics**						
1235					Number of Valid Data	34				Number of Detected Data		14
1236					Number of Distinct Detected Data	12				Number of Non-Detect Data		20
1237										Percent Non-Detects		58.82%
1238												
1239					**Raw Statistics**					**Log-transformed Statistics**		
1240					Minimum Detected	0.00079				Minimum Detected		-7.143
1241					Maximum Detected	0.25				Maximum Detected		-1.386
1242					Mean of Detected	0.0264				Mean of Detected		-4.805
1243					SD of Detected	0.0649				SD of Detected		1.346
1244					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
1245					Maximum Non-Detect	0.4				Maximum Non-Detect		-0.916
1246												
1247	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		34
1248	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1249	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1250												
1251						**UCL Statistics**						
1252					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
1253					Shapiro Wilk Test Statistic	0.396				Shapiro Wilk Test Statistic		0.915
1254					5% Shapiro Wilk Critical Value	0.874				5% Shapiro Wilk Critical Value		0.874
1255					**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
1256												
1257					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
1258					DL/2 Substitution Method					DL/2 Substitution Method		
1259					Mean	0.0204				Mean		-5.258
1260					SD	0.0527				SD		1.611
1261					95% DL/2 (t) UCL	0.0357				95% H-Stat (DL/2) UCL		0.0275
1262												
1263					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1264					**MLE method failed to converge properly**					Mean in Log Scale		-5.874
1265										SD in Log Scale		1.448
1266										Mean in Original Scale		0.0121
1267										SD in Original Scale		0.0425
1268										95% Percentile Bootstrap UCL		0.0266
1269										95% BCA Bootstrap UCL		0.034
1270												
1271					**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**		
1272					k star (bias corrected)	0.47				**Data appear Lognormal at 5% Significance Level**		

1273					Theta Star	0.0562						
1274					nu star	13.15						
1275												
1276					A-D Test Statistic	1.622	**Nonparametric Statistics**					
1277					5% A-D Critical Value	0.79	Kaplan-Meier (KM) Method					
1278					K-S Test Statistic	0.79	Mean	0.0128				
1279					5% K-S Critical Value	0.241	SD	0.0425				
1280	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00769				
1281							95% KM (t) UCL	0.0258				
1282	**Assuming Gamma Distribution**						95% KM (z) UCL	0.0255				
1283	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.025				
1284					Minimum	1E-09	95% KM (bootstrap t) UCL	0.0809				
1285					Maximum	0.25	95% KM (BCA) UCL	0.0326				
1286					Mean	0.036	95% KM (Percentile Bootstrap) UCL	0.0269				
1287					Median	0.0132	95% KM (Chebyshev) UCL	0.0464				
1288					SD	0.0579	97.5% KM (Chebyshev) UCL	0.0609				
1289					k star	0.204	99% KM (Chebyshev) UCL	0.0894				
1290					Theta star	0.177						
1291					Nu star	13.87	**Potential UCLs to Use**					
1292					AppChi2	6.481	95% KM (BCA) UCL	0.0326				
1293					95% Gamma Approximate UCL	0.0771						
1294					95% Adjusted Gamma UCL	0.0801						
1295	**Note: DL/2 is not a recommended method.**											
1296												
1297												
1298	**Nickel, dissolved (mw-20-70)**											
1299												
1300	**General Statistics**											
1301					Number of Valid Data	36	Number of Detected Data	15				
1302					Number of Distinct Detected Data	15	Number of Non-Detect Data	21				
1303							Percent Non-Detects	58.33%				
1304												
1305	**Raw Statistics**						**Log-transformed Statistics**					
1306					Minimum Detected	0.0012	Minimum Detected	-6.725				
1307					Maximum Detected	0.029	Maximum Detected	-3.54				
1308					Mean of Detected	0.00742	Mean of Detected	-5.337				
1309					SD of Detected	0.00779	SD of Detected	0.944				
1310					Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908				
1311					Maximum Non-Detect	0.0278	Maximum Non-Detect	-3.583				
1312												
1313	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	35				
1314	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	1				
1315	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	97.22%				
1316												
1317	**UCL Statistics**											
1318	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1319					Shapiro Wilk Test Statistic	0.765	Shapiro Wilk Test Statistic	0.948				
1320					5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881				
1321	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1322												
1323	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1324					DL/2 Substitution Method		DL/2 Substitution Method					
1325					Mean	0.00764	Mean	-5.384				

1326					SD	0.00642					SD	1.194
1327					95% DL/2 (t) UCL	0.00945					95% H-Stat (DL/2) UCL	0.0173
1328												
1329					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1330					**MLE method failed to converge properly**						Mean in Log Scale	-6.009
1331											SD in Log Scale	1.06
1332											Mean in Original Scale	0.00435
1333											SD in Original Scale	0.00577
1334											95% Percentile Bootstrap UCL	0.00606
1335											95% BCA Bootstrap UCL	0.0065
1336												
1337					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
1338					k star (bias corrected)	1.079					**Data appear Gamma Distributed at 5% Significance Level**	
1339					Theta Star	0.00688						
1340					nu star	32.38						
1341												
1342					A-D Test Statistic	0.59					**Nonparametric Statistics**	
1343					5% A-D Critical Value	0.758					Kaplan-Meier (KM) Method	
1344					K-S Test Statistic	0.758					Mean	0.00494
1345					5% K-S Critical Value	0.227					SD	0.00605
1346					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0012
1347											95% KM (t) UCL	0.00697
1348					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00692
1349					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00683
1350					Minimum	0.0012					95% KM (bootstrap t) UCL	0.00759
1351					Maximum	0.029					95% KM (BCA) UCL	0.00743
1352					Mean	0.00792					95% KM (Percentile Bootstrap) UCL	0.00703
1353					Median	0.0065					95% KM (Chebyshev) UCL	0.0102
1354					SD	0.00583					97.5% KM (Chebyshev) UCL	0.0125
1355					k star	1.928					99% KM (Chebyshev) UCL	0.0169
1356					Theta star	0.00411						
1357					Nu star	138.8					**Potential UCLs to Use**	
1358					AppChi2	112.6					95% KM (t) UCL	0.00697
1359					95% Gamma Approximate UCL	0.00977						
1360					95% Adjusted Gamma UCL	0.00986						
1361	**Note: DL/2 is not a recommended method.**											
1362												
1363												
1364	**Nickel, dissolved (mw-21)**											
1365												
1366							**General Statistics**					
1367					Number of Valid Data	25					Number of Detected Data	20
1368					Number of Distinct Detected Data	20					Number of Non-Detect Data	5
1369											Percent Non-Detects	20.00%
1370												
1371					**Raw Statistics**						**Log-transformed Statistics**	
1372					Minimum Detected	0.0017					Minimum Detected	-6.377
1373					Maximum Detected	0.158					Maximum Detected	-1.845
1374					Mean of Detected	0.0244					Mean of Detected	-4.353
1375					SD of Detected	0.0347					SD of Detected	1.178
1376					Minimum Non-Detect	0.02					Minimum Non-Detect	-3.912
1377					Maximum Non-Detect	0.025					Maximum Non-Detect	-3.689
1378												

	A	B	C	D	E	F	G	H	I	J	K	L
1379	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	18
1380	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	7
1381	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	72.00%
1382												
1383	**UCL Statistics**											
1384	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1385					Shapiro Wilk Test Statistic	0.598					Shapiro Wilk Test Statistic	0.972
1386					5% Shapiro Wilk Critical Value	0.905					5% Shapiro Wilk Critical Value	0.905
1387	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1388												
1389	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1390					DL/2 Substitution Method						DL/2 Substitution Method	
1391					Mean	0.0217					Mean	-4.386
1392					SD	0.0314					SD	1.051
1393					95% DL/2 (t) UCL	0.0325					95% H-Stat (DL/2) UCL	0.0359
1394												
1395					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1396	**MLE yields a negative mean**										Mean in Log Scale	-4.489
1397											SD in Log Scale	1.104
1398											Mean in Original Scale	0.021
1399											SD in Original Scale	0.0317
1400											95% Percentile Bootstrap UCL	0.0328
1401											95% BCA Bootstrap UCL	0.0386
1402												
1403	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1404					k star (bias corrected)	0.809	**Data appear Gamma Distributed at 5% Significance Level**					
1405					Theta Star	0.0302						
1406					nu star	32.35						
1407												
1408					A-D Test Statistic	0.445	**Nonparametric Statistics**					
1409					5% A-D Critical Value	0.772					Kaplan-Meier (KM) Method	
1410					K-S Test Statistic	0.772					Mean	0.0212
1411					5% K-S Critical Value	0.2					SD	0.031
1412	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0064
1413											95% KM (t) UCL	0.0322
1414	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0318
1415					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0321
1416					Minimum	0.0006888					95% KM (bootstrap t) UCL	0.0465
1417					Maximum	0.158					95% KM (BCA) UCL	0.0339
1418					Mean	0.0231					95% KM (Percentile Bootstrap) UCL	0.0324
1419					Median	0.0164					95% KM (Chebyshev) UCL	0.0491
1420					SD	0.0316					97.5% KM (Chebyshev) UCL	0.0612
1421					k star	0.827					99% KM (Chebyshev) UCL	0.0849
1422					Theta star	0.0279						
1423					Nu star	41.33	**Potential UCLs to Use**					
1424					AppChi2	27.6					95% KM (Chebyshev) UCL	0.0491
1425					95% Gamma Approximate UCL	0.0346						
1426					95% Adjusted Gamma UCL	0.0356						
1427	**Note: DL/2 is not a recommended method.**											
1428												
1429												
1430	**Nickel, dissolved (mw-22)**											
1431												

	A	B	C	D	E	F	G	H	I	J	K	L
1432	**General Statistics**											
1433					Number of Valid Data	27				Number of Detected Data		17
1434					Number of Distinct Detected Data	17				Number of Non-Detect Data		10
1435										Percent Non-Detects		37.04%
1436												
1437	**Raw Statistics**						**Log-transformed Statistics**					
1438					Minimum Detected	0.0013				Minimum Detected		-6.645
1439					Maximum Detected	0.5				Maximum Detected		-0.693
1440					Mean of Detected	0.0479				Mean of Detected		-4.358
1441					SD of Detected	0.12				SD of Detected		1.476
1442					Minimum Non-Detect	0.02				Minimum Non-Detect		-3.912
1443					Maximum Non-Detect	0.0278				Maximum Non-Detect		-3.583
1444												
1445	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		24
1446	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		3
1447	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		88.89%
1448												
1449	**UCL Statistics**											
1450	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1451					Shapiro Wilk Test Statistic	0.404				Shapiro Wilk Test Statistic		0.938
1452					5% Shapiro Wilk Critical Value	0.892				5% Shapiro Wilk Critical Value		0.892
1453	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1454												
1455	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1456					DL/2 Substitution Method					DL/2 Substitution Method		
1457					Mean	0.0343				Mean		-4.413
1458					SD	0.0958				SD		1.163
1459					95% DL/2 (t) UCL	0.0657				95% H-Stat (DL/2) UCL		0.039
1460												
1461					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1462	**MLE yields a negative mean**									Mean in Log Scale		-4.668
1463										SD in Log Scale		1.302
1464										Mean in Original Scale		0.0327
1465										SD in Original Scale		0.0962
1466										95% Percentile Bootstrap UCL		0.0686
1467										95% BCA Bootstrap UCL		0.0884
1468												
1469	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1470					k star (bias corrected)	0.438	**Data appear Lognormal at 5% Significance Level**					
1471					Theta Star	0.109						
1472					nu star	14.88						
1473												
1474					A-D Test Statistic	1.581	**Nonparametric Statistics**					
1475					5% A-D Critical Value	0.801				Kaplan-Meier (KM) Method		
1476					K-S Test Statistic	0.801				Mean		0.0329
1477					5% K-S Critical Value	0.221				SD		0.0944
1478	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.0187
1479										95% KM (t) UCL		0.0649
1480	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0638
1481					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.0646
1482					Minimum	1E-09				95% KM (bootstrap t) UCL		0.261
1483					Maximum	0.5				95% KM (BCA) UCL		0.0681
1484					Mean	0.0478				95% KM (Percentile Bootstrap) UCL		0.0669

1485					Median	0.0175				95% KM (Chebyshev) UCL		0.115
1486					SD	0.0995				97.5% KM (Chebyshev) UCL		0.15
1487					k star	0.243				99% KM (Chebyshev) UCL		0.219
1488					Theta star	0.196						
1489					Nu star	13.13				**Potential UCLs to Use**		
1490					AppChi2	5.981				97.5% KM (Chebyshev) UCL		0.15
1491					95% Gamma Approximate UCL	0.105						
1492					95% Adjusted Gamma UCL	0.111						
1493	**Note: DL/2 is not a recommended method.**											
1494												
1495												
1496	**Nickel, dissolved (mw-23)**											
1497												
1498					**General Statistics**							
1499					Number of Valid Data	26				Number of Detected Data		15
1500					Number of Distinct Detected Data	15				Number of Non-Detect Data		11
1501										Percent Non-Detects		42.31%
1502												
1503					**Raw Statistics**					**Log-transformed Statistics**		
1504					Minimum Detected	0.0015				Minimum Detected		-6.502
1505					Maximum Detected	0.25				Maximum Detected		-1.386
1506					Mean of Detected	0.0327				Mean of Detected		-4.382
1507					SD of Detected	0.0615				SD of Detected		1.465
1508					Minimum Non-Detect	0.02				Minimum Non-Detect		-3.912
1509					Maximum Non-Detect	0.025				Maximum Non-Detect		-3.689
1510												
1511	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		20
1512	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		6
1513	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		76.92%
1514												
1515					**UCL Statistics**							
1516					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
1517					Shapiro Wilk Test Statistic	0.472				Shapiro Wilk Test Statistic		0.897
1518					5% Shapiro Wilk Critical Value	0.881				5% Shapiro Wilk Critical Value		0.881
1519					**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
1520												
1521					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
1522					DL/2 Substitution Method					DL/2 Substitution Method		
1523					Mean	0.0235				Mean		-4.442
1524					SD	0.0473				SD		1.101
1525					95% DL/2 (t) UCL	0.0394				95% H-Stat (DL/2) UCL		0.0385
1526												
1527					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1528					**MLE yields a negative mean**					Mean in Log Scale		-4.818
1529										SD in Log Scale		1.314
1530										Mean in Original Scale		0.0213
1531										SD in Original Scale		0.048
1532										95% Percentile Bootstrap UCL		0.0397
1533										95% BCA Bootstrap UCL		0.0513
1534												
1535					**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**		
1536					k star (bias corrected)	0.553				**Data appear Lognormal at 5% Significance Level**		
1537					Theta Star	0.0592						

1538					nu star	16.6						
1539												
1540					A-D Test Statistic	0.881	**Nonparametric Statistics**					
1541					5% A-D Critical Value	0.783					Kaplan-Meier (KM) Method	
1542					K-S Test Statistic	0.783					Mean	0.022
1543					5% K-S Critical Value	0.232					SD	0.047
1544	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00965
1545											95% KM (t) UCL	0.0385
1546	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0379
1547					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0383
1548					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0681
1549					Maximum	0.25					95% KM (BCA) UCL	0.0415
1550					Mean	0.0333					95% KM (Percentile Bootstrap) UCL	0.0397
1551					Median	0.0219					95% KM (Chebyshev) UCL	0.0641
1552					SD	0.0498					97.5% KM (Chebyshev) UCL	0.0823
1553					k star	0.439					99% KM (Chebyshev) UCL	0.118
1554					Theta star	0.0759						
1555					Nu star	22.81	**Potential UCLs to Use**					
1556					AppChi2	12.95					97.5% KM (Chebyshev) UCL	0.0823
1557					95% Gamma Approximate UCL	0.0587						
1558					95% Adjusted Gamma UCL	0.061						
1559	**Note: DL/2 is not a recommended method.**											
1560												
1561												
1562	**Nickel, dissolved (mw-24a)**											
1563												
1564	**General Statistics**											
1565					Number of Valid Data	25					Number of Detected Data	11
1566					Number of Distinct Detected Data	11					Number of Non-Detect Data	14
1567											Percent Non-Detects	56.00%
1568												
1569	**Raw Statistics**						**Log-transformed Statistics**					
1570					Minimum Detected	0.0013					Minimum Detected	-6.645
1571					Maximum Detected	0.0225					Maximum Detected	-3.794
1572					Mean of Detected	0.00554					Mean of Detected	-5.505
1573					SD of Detected	0.00585					SD of Detected	0.762
1574					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
1575					Maximum Non-Detect	0.0278					Maximum Non-Detect	-3.583
1576												
1577	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	25
1578	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1579	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1580												
1581	**UCL Statistics**											
1582	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1583					Shapiro Wilk Test Statistic	0.607					Shapiro Wilk Test Statistic	0.916
1584					5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85
1585	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1586												
1587	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1588					DL/2 Substitution Method						DL/2 Substitution Method	
1589					Mean	0.00817					Mean	-5.048
1590					SD	0.0052					SD	0.766

1591				95% DL/2 (t) UCL	0.00995					95% H-Stat (DL/2) UCL	0.0133	
1592												
1593				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1594	**MLE method failed to converge properly**									Mean in Log Scale	-5.626	
1595										SD in Log Scale	0.598	
1596										Mean in Original Scale	0.00444	
1597										SD in Original Scale	0.00407	
1598										95% Percentile Bootstrap UCL	0.0059	
1599										95% BCA Bootstrap UCL	0.00673	
1600												
1601	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
1602				k star (bias corrected)	1.349					**Data appear Lognormal at 5% Significance Level**		
1603				Theta Star	0.00411							
1604				nu star	29.67							
1605												
1606				A-D Test Statistic	0.743					**Nonparametric Statistics**		
1607				5% A-D Critical Value	0.74					Kaplan-Meier (KM) Method		
1608				K-S Test Statistic	0.74					Mean	0.00466	
1609				5% K-S Critical Value	0.259					SD	0.00448	
1610	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00112	
1611										95% KM (t) UCL	0.00658	
1612	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0065	
1613				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00657	
1614				Minimum	0.0004995					95% KM (bootstrap t) UCL	0.00823	
1615				Maximum	0.0225					95% KM (BCA) UCL	0.0065	
1616				Mean	0.00581					95% KM (Percentile Bootstrap) UCL	0.00654	
1617				Median	0.00529					95% KM (Chebyshev) UCL	0.00955	
1618				SD	0.0045					97.5% KM (Chebyshev) UCL	0.0117	
1619				k star	1.82					99% KM (Chebyshev) UCL	0.0158	
1620				Theta star	0.00319							
1621				Nu star	90.99					**Potential UCLs to Use**		
1622				AppChi2	69.99					95% KM (t) UCL	0.00658	
1623				95% Gamma Approximate UCL	0.00755					95% KM (% Bootstrap) UCL	0.00654	
1624				95% Adjusted Gamma UCL	0.00768							
1625	**Note: DL/2 is not a recommended method.**											
1626												
1627												
1628	**Nickel, dissolved (mw-24b)**											
1629												
1630	**General Statistics**											
1631				Number of Valid Data	23					Number of Detected Data	12	
1632				Number of Distinct Detected Data	11					Number of Non-Detect Data	11	
1633										Percent Non-Detects	47.83%	
1634												
1635	**Raw Statistics**									**Log-transformed Statistics**		
1636				Minimum Detected	0.00069					Minimum Detected	-7.279	
1637				Maximum Detected	0.053					Maximum Detected	-2.937	
1638				Mean of Detected	0.0102					Mean of Detected	-5.45	
1639				SD of Detected	0.0159					SD of Detected	1.344	
1640				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
1641				Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916	
1642												
1643	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	23	

1644	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1645	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1646												
1647	**UCL Statistics**											
1648	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1649	Shapiro Wilk Test Statistic				0.638		Shapiro Wilk Test Statistic					0.955
1650	5% Shapiro Wilk Critical Value				0.859		5% Shapiro Wilk Critical Value					0.859
1651	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1652												
1653	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1654	DL/2 Substitution Method						DL/2 Substitution Method					
1655	Mean				0.0188		Mean					-4.977
1656	SD				0.0411		SD					1.409
1657	95% DL/2 (t) UCL				0.0335		95% H-Stat (DL/2) UCL					0.0567
1658												
1659	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
1660	**MLE method failed to converge properly**						Mean in Log Scale					-5.743
1661							SD in Log Scale					1.115
1662							Mean in Original Scale					0.00673
1663							SD in Original Scale					0.0119
1664							95% Percentile Bootstrap UCL					0.011
1665							95% BCA Bootstrap UCL					0.0124
1666												
1667	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1668	k star (bias corrected)				0.578		**Data appear Gamma Distributed at 5% Significance Level**					
1669	Theta Star				0.0177							
1670	nu star				13.86							
1671												
1672	A-D Test Statistic				0.646		**Nonparametric Statistics**					
1673	5% A-D Critical Value				0.77		Kaplan-Meier (KM) Method					
1674	K-S Test Statistic				0.77		Mean					0.00709
1675	5% K-S Critical Value				0.256		SD					0.0119
1676	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00271
1677							95% KM (t) UCL					0.0117
1678	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0116
1679	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0117
1680	Minimum				0.00069		95% KM (bootstrap t) UCL					0.0203
1681	Maximum				0.053		95% KM (BCA) UCL					0.0124
1682	Mean				0.0101		95% KM (Percentile Bootstrap) UCL					0.0116
1683	Median				0.00776		95% KM (Chebyshev) UCL					0.0189
1684	SD				0.0113		97.5% KM (Chebyshev) UCL					0.024
1685	k star				1.09		99% KM (Chebyshev) UCL					0.0341
1686	Theta star				0.00924							
1687	Nu star				50.14		**Potential UCLs to Use**					
1688	AppChi2				34.88		95% KM (BCA) UCL					0.0124
1689	95% Gamma Approximate UCL				0.0145							
1690	95% Adjusted Gamma UCL				0.0149							
1691	**Note: DL/2 is not a recommended method.**											
1692												
1693												
1694	**Nickel, dissolved (mw-24br)**											
1695												
1696	**General Statistics**											

1697				Number of Valid Data	22					Number of Detected Data	11	
1698				Number of Distinct Detected Data	9					Number of Non-Detect Data	11	
1699										Percent Non-Detects	50.00%	
1700												
1701	**Raw Statistics**					**Log-transformed Statistics**						
1702				Minimum Detected	0.0017					Minimum Detected	-6.377	
1703				Maximum Detected	0.0172					Maximum Detected	-4.063	
1704				Mean of Detected	0.00547					Mean of Detected	-5.509	
1705				SD of Detected	0.00481					SD of Detected	0.793	
1706				Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298	
1707				Maximum Non-Detect	0.0278					Maximum Non-Detect	-3.583	
1708												
1709	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	22	
1710	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1711	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1712												
1713	**UCL Statistics**											
1714	**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**						
1715				Shapiro Wilk Test Statistic	0.796					Shapiro Wilk Test Statistic	0.911	
1716				5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85	
1717	**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**						
1718												
1719	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
1720				DL/2 Substitution Method						DL/2 Substitution Method		
1721				Mean	0.00837					Mean	-5.036	
1722				SD	0.00499					SD	0.805	
1723				95% DL/2 (t) UCL	0.0102					95% H-Stat (DL/2) UCL	0.0173	
1724												
1725				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1726	**MLE method failed to converge properly**									Mean in Log Scale	-5.55	
1727										SD in Log Scale	0.629	
1728										Mean in Original Scale	0.00478	
1729										SD in Original Scale	0.00362	
1730										95% Percentile Bootstrap UCL	0.00608	
1731										95% BCA Bootstrap UCL	0.00651	
1732												
1733	**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**						
1734				k star (bias corrected)	1.377	**Data appear Gamma Distributed at 5% Significance Level**						
1735				Theta Star	0.00398							
1736				nu star	30.29							
1737												
1738				A-D Test Statistic	0.512	**Nonparametric Statistics**						
1739				5% A-D Critical Value	0.74					Kaplan-Meier (KM) Method		
1740				K-S Test Statistic	0.74					Mean	0.00523	
1741				5% K-S Critical Value	0.259					SD	0.00447	
1742	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00136	
1743										95% KM (t) UCL	0.00757	
1744	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00747	
1745				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00761	
1746				Minimum	0.0017					95% KM (bootstrap t) UCL	0.0101	
1747				Maximum	0.0172					95% KM (BCA) UCL	0.00763	
1748				Mean	0.00572					95% KM (Percentile Bootstrap) UCL	0.00758	
1749				Median	0.00394					95% KM (Chebyshev) UCL	0.0111	

1750					SD	0.00388				97.5% KM (Chebyshev) UCL		0.0137
1751					k star	2.193				99% KM (Chebyshev) UCL		0.0187
1752					Theta star	0.00261						
1753					Nu star	96.51				**Potential UCLs to Use**		
1754					AppChi2	74.85				95% KM (t) UCL		0.00757
1755					95% Gamma Approximate UCL	0.00737						
1756					95% Adjusted Gamma UCL	0.00751						
1757	**Note: DL/2 is not a recommended method.**											
1758												
1759												
1760	**Nickel, dissolved (mw-25)**											
1761												
1762					**General Statistics**							
1763					Number of Valid Data	29				Number of Detected Data		15
1764					Number of Distinct Detected Data	14				Number of Non-Detect Data		14
1765										Percent Non-Detects		48.28%
1766												
1767					**Raw Statistics**					**Log-transformed Statistics**		
1768					Minimum Detected	0.00122				Minimum Detected		-6.709
1769					Maximum Detected	0.0213				Maximum Detected		-3.849
1770					Mean of Detected	0.00467				Mean of Detected		-5.695
1771					SD of Detected	0.00507				SD of Detected		0.766
1772					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
1773					Maximum Non-Detect	0.0278				Maximum Non-Detect		-3.583
1774												
1775	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		29
1776	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1777	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1778												
1779					**UCL Statistics**							
1780					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
1781					Shapiro Wilk Test Statistic	0.64				Shapiro Wilk Test Statistic		0.943
1782					5% Shapiro Wilk Critical Value	0.881				5% Shapiro Wilk Critical Value		0.881
1783					**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
1784												
1785					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
1786					DL/2 Substitution Method					DL/2 Substitution Method		
1787					Mean	0.0072				Mean		-5.248
1788					SD	0.00533				SD		0.852
1789					95% DL/2 (t) UCL	0.00889				95% H-Stat (DL/2) UCL		0.017
1790												
1791					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1792					**MLE method failed to converge properly**					Mean in Log Scale		-5.77
1793										SD in Log Scale		0.617
1794										Mean in Original Scale		0.00392
1795										SD in Original Scale		0.00377
1796										95% Percentile Bootstrap UCL		0.00527
1797										95% BCA Bootstrap UCL		0.00584
1798												
1799					**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**		
1800					k star (bias corrected)	1.379				**Data appear Gamma Distributed at 5% Significance Level**		
1801					Theta Star	0.00339						
1802					nu star	41.37						

1803												
1804					A-D Test Statistic	0.697	**Nonparametric Statistics**					
1805					5% A-D Critical Value	0.751					Kaplan-Meier (KM) Method	
1806					K-S Test Statistic	0.751					Mean	0.00413
1807					5% K-S Critical Value	0.225					SD	0.00423
1808	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0009631
1809											95% KM (t) UCL	0.00577
1810	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00572
1811	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00577
1812					Minimum	0.00122					95% KM (bootstrap t) UCL	0.00778
1813					Maximum	0.0213					95% KM (BCA) UCL	0.00582
1814					Mean	0.00501					95% KM (Percentile Bootstrap) UCL	0.00591
1815					Median	0.0038					95% KM (Chebyshev) UCL	0.00833
1816					SD	0.00401					97.5% KM (Chebyshev) UCL	0.0101
1817					k star	2.028					99% KM (Chebyshev) UCL	0.0137
1818					Theta star	0.00247						
1819					Nu star	117.6	**Potential UCLs to Use**					
1820					AppChi2	93.6					95% KM (t) UCL	0.00577
1821					95% Gamma Approximate UCL	0.0063						
1822					95% Adjusted Gamma UCL	0.00639						
1823	**Note: DL/2 is not a recommended method.**											
1824												
1825												
1826	**Nickel, dissolved (mw-26)**											
1827												
1828	**General Statistics**											
1829					Number of Valid Data	25					Number of Detected Data	11
1830					Number of Distinct Detected Data	11					Number of Non-Detect Data	14
1831											Percent Non-Detects	56.00%
1832												
1833	**Raw Statistics**						**Log-transformed Statistics**					
1834					Minimum Detected	0.0014					Minimum Detected	-6.571
1835					Maximum Detected	0.0183					Maximum Detected	-4.001
1836					Mean of Detected	0.0068					Mean of Detected	-5.366
1837					SD of Detected	0.00609					SD of Detected	0.923
1838					Minimum Non-Detect	0.02					Minimum Non-Detect	-3.912
1839					Maximum Non-Detect	0.0278					Maximum Non-Detect	-3.583
1840												
1841	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	25
1842	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1843	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1844												
1845	**UCL Statistics**											
1846	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1847					Shapiro Wilk Test Statistic	0.82					Shapiro Wilk Test Statistic	0.925
1848					5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85
1849	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1850												
1851	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1852					DL/2 Substitution Method						DL/2 Substitution Method	
1853					Mean	0.00955					Mean	-4.857
1854					SD	0.0048					SD	0.76
1855					95% DL/2 (t) UCL	0.0112					95% H-Stat (DL/2) UCL	0.0193

1856												
1857				Maximum Likelihood Estimate(MLE) Method		N/A		Log ROS Method				
1858				**MLE method failed to converge properly**				Mean in Log Scale				-5.366
1859								SD in Log Scale				0.78
1860								Mean in Original Scale				0.00622
1861								SD in Original Scale				0.00489
1862								95% Percentile Bootstrap UCL				0.00796
1863								95% BCA Bootstrap UCL				0.00808
1864												
1865				**Gamma Distribution Test with Detected Values Only**				**Data Distribution Test with Detected Values Only**				
1866				k star (bias corrected)		1.134		**Data appear Gamma Distributed at 5% Significance Level**				
1867				Theta Star		0.006						
1868				nu star		24.94						
1869												
1870				A-D Test Statistic		0.436		**Nonparametric Statistics**				
1871				5% A-D Critical Value		0.743		Kaplan-Meier (KM) Method				
1872				K-S Test Statistic		0.743		Mean				0.0068
1873				5% K-S Critical Value		0.26		SD				0.00581
1874				**Data appear Gamma Distributed at 5% Significance Level**				SE of Mean				0.00184
1875								95% KM (t) UCL				0.00994
1876				**Assuming Gamma Distribution**				95% KM (z) UCL				0.00982
1877				Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL				0.01
1878				Minimum		1E-09		95% KM (bootstrap t) UCL				0.0121
1879				Maximum		0.0183		95% KM (BCA) UCL				0.00996
1880				Mean		0.00685		95% KM (Percentile Bootstrap) UCL				0.00998
1881				Median		0.0055		95% KM (Chebyshev) UCL				0.0148
1882				SD		0.00512		97.5% KM (Chebyshev) UCL				0.0183
1883				k star		0.637		99% KM (Chebyshev) UCL				0.0251
1884				Theta star		0.0107						
1885				Nu star		31.85		**Potential UCLs to Use**				
1886				AppChi2		19.95		95% KM (t) UCL				0.00994
1887				95% Gamma Approximate UCL		0.0109						
1888				95% Adjusted Gamma UCL		0.0113						
1889	**Note: DL/2 is not a recommended method.**											
1890												
1891												
1892	**Nickel, dissolved (mw-27-20)**											
1893												
1894							**General Statistics**					
1895				Number of Valid Data		22		Number of Detected Data				12
1896				Number of Distinct Detected Data		10		Number of Non-Detect Data				10
1897								Percent Non-Detects				45.45%
1898												
1899				**Raw Statistics**				**Log-transformed Statistics**				
1900				Minimum Detected		0.0014		Minimum Detected				-6.571
1901				Maximum Detected		0.11		Maximum Detected				-2.207
1902				Mean of Detected		0.0183		Mean of Detected				-5.044
1903				SD of Detected		0.0336		SD of Detected				1.331
1904				Minimum Non-Detect		0.005		Minimum Non-Detect				-5.298
1905				Maximum Non-Detect		0.0278		Maximum Non-Detect				-3.583
1906												
1907	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect				20
1908	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected				2

1909	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	90.91%
1910												
1911	**UCL Statistics**											
1912	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1913	Shapiro Wilk Test Statistic				0.553		Shapiro Wilk Test Statistic					0.851
1914	5% Shapiro Wilk Critical Value				0.859		5% Shapiro Wilk Critical Value					0.859
1915	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1916												
1917	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1918	DL/2 Substitution Method						DL/2 Substitution Method					
1919	Mean				0.0151		Mean					-4.833
1920	SD				0.0247		SD					1.047
1921	95% DL/2 (t) UCL				0.0241		95% H-Stat (DL/2) UCL					0.0241
1922												
1923	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
1924	**MLE method failed to converge properly**						Mean in Log Scale					-5.265
1925							SD in Log Scale					1.064
1926							Mean in Original Scale					0.0121
1927							SD in Original Scale					0.0253
1928							95% Percentile Bootstrap UCL					0.0218
1929							95% BCA Bootstrap UCL					0.0271
1930												
1931	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1932	k star (bias corrected)				0.5		**Data do not follow a Discernable Distribution (0.05)**					
1933	Theta Star				0.0366							
1934	nu star				12.01							
1935												
1936	A-D Test Statistic				1.508		**Nonparametric Statistics**					
1937	5% A-D Critical Value				0.778		Kaplan-Meier (KM) Method					
1938	K-S Test Statistic				0.778		Mean					0.0119
1939	5% K-S Critical Value				0.257		SD					0.0248
1940	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.00556
1941							95% KM (t) UCL					0.0215
1942	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0211
1943	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0213
1944	Minimum				0.0014		95% KM (bootstrap t) UCL					0.0724
1945	Maximum				0.11		95% KM (BCA) UCL					0.0228
1946	Mean				0.018		95% KM (Percentile Bootstrap) UCL					0.0215
1947	Median				0.0151		95% KM (Chebyshev) UCL					0.0361
1948	SD				0.0244		97.5% KM (Chebyshev) UCL					0.0466
1949	k star				0.898		99% KM (Chebyshev) UCL					0.0672
1950	Theta star				0.0201							
1951	Nu star				39.52		**Potential UCLs to Use**					
1952	AppChi2				26.12		97.5% KM (Chebyshev) UCL					0.0466
1953	95% Gamma Approximate UCL				0.0273							
1954	95% Adjusted Gamma UCL				0.0282							
1955	**Note: DL/2 is not a recommended method.**											
1956												
1957												
1958	**Nickel, dissolved (mw-28-25)**											
1959												
1960	**General Statistics**											
1961	Number of Valid Data				21		Number of Detected Data					10

1962					Number of Distinct Detected Data	6					Number of Non-Detect Data	11
1963											Percent Non-Detects	52.38%
1964												
1965					**Raw Statistics**						**Log-transformed Statistics**	
1966					Minimum Detected	0.0022					Minimum Detected	-6.119
1967					Maximum Detected	0.0206					Maximum Detected	-3.882
1968					Mean of Detected	0.00742					Mean of Detected	-5.071
1969					SD of Detected	0.00515					SD of Detected	0.59
1970					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
1971					Maximum Non-Detect	0.0278					Maximum Non-Detect	-3.583
1972												
1973	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	21
1974	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1975	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1976												
1977					**UCL Statistics**							
1978					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
1979					Shapiro Wilk Test Statistic	0.743					Shapiro Wilk Test Statistic	0.902
1980					5% Shapiro Wilk Critical Value	0.842					5% Shapiro Wilk Critical Value	0.842
1981					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
1982												
1983					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1984					DL/2 Substitution Method						DL/2 Substitution Method	
1985					Mean	0.00943					Mean	-4.804
1986					SD	0.0046					SD	0.588
1987					95% DL/2 (t) UCL	0.0112					95% H-Stat (DL/2) UCL	0.015
1988												
1989					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1990					**MLE method failed to converge properly**						Mean in Log Scale	-5.181
1991											SD in Log Scale	0.5
1992											Mean in Original Scale	0.00639
1993											SD in Original Scale	0.00388
1994											95% Percentile Bootstrap UCL	0.00786
1995											95% BCA Bootstrap UCL	0.00831
1996												
1997					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
1998					k star (bias corrected)	2.266					**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
1999					Theta Star	0.00327						
2000					nu star	45.33						
2001												
2002					A-D Test Statistic	0.72					**Nonparametric Statistics**	
2003					5% A-D Critical Value	0.732					Kaplan-Meier (KM) Method	
2004					K-S Test Statistic	0.732					Mean	0.00665
2005					5% K-S Critical Value	0.268					SD	0.00451
2006					**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean	0.00132
2007											95% KM (t) UCL	0.00893
2008					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00883
2009					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00886
2010					Minimum	0.00161					95% KM (bootstrap t) UCL	0.0105
2011					Maximum	0.0206					95% KM (BCA) UCL	0.00924
2012					Mean	0.00744					95% KM (Percentile Bootstrap) UCL	0.00903
2013					Median	0.00618					95% KM (Chebyshev) UCL	0.0124
2014					SD	0.00407					97.5% KM (Chebyshev) UCL	0.0149

2015					k star	3.249				99% KM (Chebyshev) UCL		0.0198
2016					Theta star	0.00229						
2017					Nu star	136.5				**Potential UCLs to Use**		
2018					AppChi2	110.5				95% KM (t) UCL		0.00893
2019					95% Gamma Approximate UCL	0.00919						
2020					95% Adjusted Gamma UCL	0.00934						
2021	**Note: DL/2 is not a recommended method.**											
2022												
2023												
2024	**Nickel, dissolved (mw-29)**											
2025												
2026	**General Statistics**											
2027					Number of Valid Data	22				Number of Detected Data		14
2028					Number of Distinct Detected Data	13				Number of Non-Detect Data		8
2029										Percent Non-Detects		36.36%
2030												
2031	**Raw Statistics**									**Log-transformed Statistics**		
2032					Minimum Detected	0.0015				Minimum Detected		-6.502
2033					Maximum Detected	0.0213				Maximum Detected		-3.849
2034					Mean of Detected	0.00772				Mean of Detected		-5.15
2035					SD of Detected	0.00625				SD of Detected		0.796
2036					Minimum Non-Detect	0.02				Minimum Non-Detect		-3.912
2037					Maximum Non-Detect	0.0278				Maximum Non-Detect		-3.583
2038												
2039	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		22
2040	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
2041	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
2042												
2043	**UCL Statistics**											
2044	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
2045					Shapiro Wilk Test Statistic	0.82				Shapiro Wilk Test Statistic		0.958
2046					5% Shapiro Wilk Critical Value	0.874				5% Shapiro Wilk Critical Value		0.874
2047	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
2048												
2049	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
2050					DL/2 Substitution Method					DL/2 Substitution Method		
2051					Mean	0.00923				Mean		-4.892
2052					SD	0.00541				SD		0.721
2053					95% DL/2 (t) UCL	0.0112				95% H-Stat (DL/2) UCL		0.0163
2054												
2055					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
2056	**MLE method failed to converge properly**									Mean in Log Scale		-5.172
2057										SD in Log Scale		0.668
2058										Mean in Original Scale		0.00704
2059										SD in Original Scale		0.00517
2060										95% Percentile Bootstrap UCL		0.009
2061										95% BCA Bootstrap UCL		0.00928
2062												
2063	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
2064					k star (bias corrected)	1.539				**Data appear Gamma Distributed at 5% Significance Level**		
2065					Theta Star	0.00502						
2066					nu star	43.1						
2067												

2068				A-D Test Statistic	0.396		**Nonparametric Statistics**					
2069				5% A-D Critical Value	0.747					Kaplan-Meier (KM) Method		
2070				K-S Test Statistic	0.747					Mean		0.00754
2071				5% K-S Critical Value	0.232					SD		0.00585
2072			**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean		0.00158
2073										95% KM (t) UCL		0.0103
2074			**Assuming Gamma Distribution**							95% KM (z) UCL		0.0101
2075			Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL		0.0103
2076				Minimum	0.0015					95% KM (bootstrap t) UCL		0.0115
2077				Maximum	0.0213					95% KM (BCA) UCL		0.0106
2078				Mean	0.00793					95% KM (Percentile Bootstrap) UCL		0.0102
2079				Median	0.00654					95% KM (Chebyshev) UCL		0.0144
2080				SD	0.00507					97.5% KM (Chebyshev) UCL		0.0174
2081				k star	2.4					99% KM (Chebyshev) UCL		0.0233
2082				Theta star	0.00331							
2083				Nu star	105.6		**Potential UCLs to Use**					
2084				AppChi2	82.88					95% KM (Percentile Bootstrap) UCL		0.0102
2085				95% Gamma Approximate UCL	0.0101							
2086				95% Adjusted Gamma UCL	0.0103							
2087	**Note: DL/2 is not a recommended method.**											
2088												
2089												
2090	**Nickel, dissolved (mw-3)**											
2091												
2092					**General Statistics**							
2093				Number of Valid Observations	5					Number of Distinct Observations		5
2094												
2095				**Raw Statistics**						**Log-transformed Statistics**		
2096				Minimum	0.0125					Minimum of Log Data		-4.382
2097				Maximum	0.042					Maximum of Log Data		-3.17
2098				Mean	0.0302					Mean of log Data		-3.588
2099				Median	0.031					SD of log Data		0.501
2100				SD	0.0124							
2101				Coefficient of Variation	0.412							
2102				Skewness	-0.583							
2103												
2104												
2105	**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
2106												
2107	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
2108	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2109												
2110												
2111	**Warning: There are only 5 Values in this data**											
2112	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
2113	**the resulting calculations may not be reliable enough to draw conclusions**											
2114												
2115	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
2116												
2117					**Relevant UCL Statistics**							
2118				**Normal Distribution Test**						**Lognormal Distribution Test**		
2119				Shapiro Wilk Test Statistic	0.917					Shapiro Wilk Test Statistic		0.876
2120				Shapiro Wilk Critical Value	0.762					Shapiro Wilk Critical Value		0.762

2121	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2122												
2123	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2124					95% Student's-t UCL	0.0421					95% H-UCL	0.0656
2125	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0601
2126					95% Adjusted-CLT UCL	0.0378					97.5% Chebyshev (MVUE) UCL	0.0729
2127					95% Modified-t UCL	0.0418					99% Chebyshev (MVUE) UCL	0.098
2128												
2129	**Gamma Distribution Test**						**Data Distribution**					
2130					k star (bias corrected)	2.481	**Data appear Normal at 5% Significance Level**					
2131					Theta Star	0.0122						
2132					nu star	24.81						
2133					Approximate Chi Square Value (.05)	14.46	**Nonparametric Statistics**					
2134					Adjusted Level of Significance	0.0086					95% CLT UCL	0.0394
2135					Adjusted Chi Square Value	11.17					95% Jackknife UCL	0.0421
2136											95% Standard Bootstrap UCL	0.0385
2137					Anderson-Darling Test Statistic	0.357					95% Bootstrap-t UCL	0.0412
2138					Anderson-Darling 5% Critical Value	0.68					95% Hall's Bootstrap UCL	0.0384
2139					Kolmogorov-Smirnov Test Statistic	0.228					95% Percentile Bootstrap UCL	0.0382
2140					Kolmogorov-Smirnov 5% Critical Value	0.358					95% BCA Bootstrap UCL	0.0375
2141	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.0545
2142											97.5% Chebyshev(Mean, Sd) UCL	0.065
2143	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.0856
2144					95% Approximate Gamma UCL	0.0518						
2145					95% Adjusted Gamma UCL	0.0671						
2146												
2147	**Potential UCL to Use**										Use 95% Student's-t UCL	0.0421
2148	**Recommended UCL exceeds the maximum observation**											
2149												
2150												
2151	**Nickel, dissolved (mw-30-30)**											
2152												
2153	**General Statistics**											
2154					Number of Valid Data	22					Number of Detected Data	15
2155					Number of Distinct Detected Data	14					Number of Non-Detect Data	7
2156											Percent Non-Detects	31.82%
2157												
2158	**Raw Statistics**						**Log-transformed Statistics**					
2159					Minimum Detected	0.0017					Minimum Detected	-6.377
2160					Maximum Detected	0.5					Maximum Detected	-0.693
2161					Mean of Detected	0.0509					Mean of Detected	-4.29
2162					SD of Detected	0.125					SD of Detected	1.541
2163					Minimum Non-Detect	0.02					Minimum Non-Detect	-3.912
2164					Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
2165												
2166	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	21
2167	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
2168	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	95.45%
2169												
2170	**UCL Statistics**											
2171	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2172					Shapiro Wilk Test Statistic	0.394					Shapiro Wilk Test Statistic	0.911
2173					5% Shapiro Wilk Critical Value	0.881					5% Shapiro Wilk Critical Value	0.881

2174	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2175												
2176	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2177				DL/2 Substitution Method						DL/2 Substitution Method		
2178				Mean		0.0467				Mean		-4.234
2179				SD		0.109				SD		1.394
2180				95% DL/2 (t) UCL		0.0869				95% H-Stat (DL/2) UCL		0.088
2181												
2182				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
2183	**MLE method failed to converge properly**									Mean in Log Scale		-4.597
2184										SD in Log Scale		1.387
2185										Mean in Original Scale		0.0367
2186										SD in Original Scale		0.105
2187										95% Percentile Bootstrap UCL		0.0797
2188										95% BCA Bootstrap UCL		0.104
2189												
2190	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2191				k star (bias corrected)		0.433	**Data appear Lognormal at 5% Significance Level**					
2192				Theta Star		0.117						
2193				nu star		13						
2194												
2195				A-D Test Statistic		1.267	**Nonparametric Statistics**					
2196				5% A-D Critical Value		0.796				Kaplan-Meier (KM) Method		
2197				K-S Test Statistic		0.796				Mean		0.037
2198				5% K-S Critical Value		0.234				SD		0.102
2199	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.0226
2200										95% KM (t) UCL		0.0758
2201	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0741
2202				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0754
2203				Minimum		0.0017				95% KM (bootstrap t) UCL		0.231
2204				Maximum		0.5				95% KM (BCA) UCL		0.0825
2205				Mean		0.0502				95% KM (Percentile Bootstrap) UCL		0.0805
2206				Median		0.0352				95% KM (Chebyshev) UCL		0.135
2207				SD		0.103				97.5% KM (Chebyshev) UCL		0.178
2208				k star		0.609				99% KM (Chebyshev) UCL		0.261
2209				Theta star		0.0824						
2210				Nu star		26.8	**Potential UCLs to Use**					
2211				AppChi2		15.99				99% KM (Chebyshev) UCL		0.261
2212				95% Gamma Approximate UCL		0.0841						
2213				95% Adjusted Gamma UCL		0.0875						
2214	**Note: DL/2 is not a recommended method.**											
2215												
2216												
2217	**Nickel, dissolved (mw-30-50)**											
2218												
2219	**General Statistics**											
2220				Number of Valid Data		6				Number of Detected Data		0
2221				Number of Distinct Detected Data		0				Number of Non-Detect Data		6
2222										Percent Non-Detects		100.00%
2223												
2224	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2225	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
2226	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											

2227												
2228	**The data set for variable Nickel, dissolved (mw-30-50) was not processed!**											
2229												
2230												
2231												
2232	**Nickel, dissolved (mw-31-135)**											
2233												
2234	**General Statistics**											
2235						Number of Valid Data	1			Number of Detected Data	0	
2236						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
2237										Percent Non-Detects	100.00%	
2238												
2239	**Warning: This data set only has 1 observations!**											
2240	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2241	**The data set for variable Nickel, dissolved (mw-31-135) was not processed!**											
2242												
2243	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2244	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2245												
2246												
2247												
2248	**Nickel, dissolved (mw-31-60)**											
2249												
2250	**General Statistics**											
2251						Number of Valid Data	23			Number of Detected Data	12	
2252						Number of Distinct Detected Data	10			Number of Non-Detect Data	11	
2253										Percent Non-Detects	47.83%	
2254												
2255	**Raw Statistics**							**Log-transformed Statistics**				
2256						Minimum Detected	0.0017			Minimum Detected	-6.377	
2257						Maximum Detected	0.13			Maximum Detected	-2.04	
2258						Mean of Detected	0.014			Mean of Detected	-5.552	
2259						SD of Detected	0.0366			SD of Detected	1.247	
2260						Minimum Non-Detect	0.005			Minimum Non-Detect	-5.298	
2261						Maximum Non-Detect	0.0278			Maximum Non-Detect	-3.583	
2262												
2263	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	22	
2264	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
2265	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	95.65%	
2266												
2267	**UCL Statistics**											
2268	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
2269						Shapiro Wilk Test Statistic	0.377			Shapiro Wilk Test Statistic	0.679	
2270						5% Shapiro Wilk Critical Value	0.859			5% Shapiro Wilk Critical Value	0.859	
2271	**Data not Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**				
2272												
2273	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
2274						DL/2 Substitution Method				DL/2 Substitution Method		
2275						Mean	0.0121			Mean	-5.154	
2276						SD	0.0261			SD	1.064	
2277						95% DL/2 (t) UCL	0.0215			95% H-Stat (DL/2) UCL	0.0171	
2278												
2279						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		

2280	MLE method failed to converge properly									Mean in Log Scale		-5.685
2281										SD in Log Scale		0.953
2282										Mean in Original Scale		0.00887
2283										SD in Original Scale		0.0265
2284										95% Percentile Bootstrap UCL		0.0197
2285										95% BCA Bootstrap UCL		0.0253
2286												
2287	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
2288				k star (bias corrected)		0.428	Data do not follow a Discernable Distribution (0.05)					
2289				Theta Star		0.0327						
2290				nu star		10.26						
2291												
2292				A-D Test Statistic		2.471	Nonparametric Statistics					
2293				5% A-D Critical Value		0.786	Kaplan-Meier (KM) Method					
2294				K-S Test Statistic		0.786	Mean					0.00875
2295				5% K-S Critical Value		0.259	SD					0.026
2296	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.00567
2297							95% KM (t) UCL					0.0185
2298	Assuming Gamma Distribution						95% KM (z) UCL					0.0181
2299				Gamma ROS Statistics using Extrapolated Data			95% KM (jackknife) UCL					0.0183
2300				Minimum		1E-09	95% KM (bootstrap t) UCL					0.105
2301				Maximum		0.13	95% KM (BCA) UCL					0.0202
2302				Mean		0.0138	95% KM (Percentile Bootstrap) UCL					0.0197
2303				Median		0.0023	95% KM (Chebyshev) UCL					0.0335
2304				SD		0.0285	97.5% KM (Chebyshev) UCL					0.0441
2305				k star		0.237	99% KM (Chebyshev) UCL					0.0652
2306				Theta star		0.0584						
2307				Nu star		10.92	Potential UCLs to Use					
2308				AppChi2		4.522	97.5% KM (Chebyshev) UCL					0.0441
2309				95% Gamma Approximate UCL		0.0334						
2310				95% Adjusted Gamma UCL		0.0358						
2311	Note: DL/2 is not a recommended method.											
2312												
2313												
2314	Nickel, dissolved (mw-32-20)											
2315												
2316	General Statistics											
2317				Number of Valid Data		6	Number of Detected Data					0
2318				Number of Distinct Detected Data		0	Number of Non-Detect Data					6
2319							Percent Non-Detects					100.00%
2320												
2321	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
2322	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
2323	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
2324												
2325	The data set for variable Nickel, dissolved (mw-32-20) was not processed!											
2326												
2327												
2328												
2329	Nickel, dissolved (mw-32-35)											
2330												
2331	General Statistics											
2332				Number of Valid Data		9	Number of Detected Data					0

2333			Number of Distinct Detected Data		0			Number of Non-Detect Data			9	
2334								Percent Non-Detects			100.00%	
2335												
2336	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
2337	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
2338	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
2339												
2340	The data set for variable Nickel, dissolved (mw-32-35) was not processed!											
2341												
2342												
2343												
2344	Nickel, dissolved (mw-33-210)											
2345												
2346	General Statistics											
2347			Number of Valid Data		1			Number of Detected Data			0	
2348			Number of Distinct Detected Data		0			Number of Non-Detect Data			1	
2349								Percent Non-Detects			100.00%	
2350												
2351	Warning: This data set only has 1 observations!											
2352	Data set is too small to compute reliable and meaningful statistics and estimates!											
2353	The data set for variable Nickel, dissolved (mw-33-210) was not processed!											
2354												
2355	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2356	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2357												
2358												
2359												
2360	Nickel, dissolved (mw-33-40)											
2361												
2362	General Statistics											
2363			Number of Valid Data		6			Number of Detected Data			0	
2364			Number of Distinct Detected Data		0			Number of Non-Detect Data			6	
2365								Percent Non-Detects			100.00%	
2366												
2367	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
2368	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
2369	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
2370												
2371	The data set for variable Nickel, dissolved (mw-33-40) was not processed!											
2372												
2373												
2374												
2375	Nickel, dissolved (mw-33-90)											
2376												
2377	General Statistics											
2378			Number of Valid Data		6			Number of Detected Data			1	
2379			Number of Distinct Detected Data		1			Number of Non-Detect Data			5	
2380								Percent Non-Detects			83.33%	
2381												
2382	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
2383	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
2384												
2385	The data set for variable Nickel, dissolved (mw-33-90) was not processed!											

2386												
2387												
2388												
2389	**Nickel, dissolved (mw-34-100)**											
2390												
2391						**General Statistics**						
2392					Number of Valid Data	2			Number of Detected Data	1		
2393					Number of Distinct Detected Data	1			Number of Non-Detect Data	1		
2394									Percent Non-Detects	50.00%		
2395												
2396						**Warning: This data set only has 2 observations!**						
2397						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
2398						**The data set for variable Nickel, dissolved (mw-34-100) was not processed!**						
2399												
2400						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
2401						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
2402												
2403												
2404												
2405	**Nickel, dissolved (mw-34-55)**											
2406												
2407						**General Statistics**						
2408					Number of Valid Data	14			Number of Detected Data	6		
2409					Number of Distinct Detected Data	6			Number of Non-Detect Data	8		
2410									Percent Non-Detects	57.14%		
2411												
2412					**Raw Statistics**				**Log-transformed Statistics**			
2413					Minimum Detected	0.00122			Minimum Detected	-6.709		
2414					Maximum Detected	0.0223			Maximum Detected	-3.803		
2415					Mean of Detected	0.0101			Mean of Detected	-5.058		
2416					SD of Detected	0.00914			SD of Detected	1.147		
2417					Minimum Non-Detect	0.005			Minimum Non-Detect	-5.298		
2418					Maximum Non-Detect	0.0261			Maximum Non-Detect	-3.646		
2419												
2420	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	14		
2421	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	0		
2422	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	100.00%		
2423												
2424						**Warning: There are only 6 Detected Values in this data**						
2425						**Note: It should be noted that even though bootstrap may be performed on this data set**						
2426						**the resulting calculations may not be reliable enough tp draw conclusions**						
2427												
2428						**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**						
2429												
2430												
2431						**UCL Statistics**						
2432					**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**			
2433					Shapiro Wilk Test Statistic	0.855			Shapiro Wilk Test Statistic	0.941		
2434					5% Shapiro Wilk Critical Value	0.788			5% Shapiro Wilk Critical Value	0.788		
2435					**Data appear Normal at 5% Significance Level**				**Data appear Lognormal at 5% Significance Level**			
2436												
2437					**Assuming Normal Distribution**				**Assuming Lognormal Distribution**			
2438					DL/2 Substitution Method				DL/2 Substitution Method			

2439				Mean	0.00865					Mean	-5.077	
2440				SD	0.00662					SD	0.9	
2441				95% DL/2 (t) UCL	0.0118					95% H-Stat (DL/2) UCL	0.0162	
2442												
2443				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2444				**MLE method failed to converge properly**						Mean in Log Scale	-5.51	
2445										SD in Log Scale	0.924	
2446										Mean in Original Scale	0.00621	
2447										SD in Original Scale	0.00678	
2448										95% Percentile Bootstrap UCL	0.00945	
2449										95% BCA Bootstrap UCL	0.00995	
2450												
2451				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
2452				k star (bias corrected)	0.722					**Data appear Normal at 5% Significance Level**		
2453				Theta Star	0.014							
2454				nu star	8.668							
2455												
2456				A-D Test Statistic	0.285					**Nonparametric Statistics**		
2457				5% A-D Critical Value	0.712					Kaplan-Meier (KM) Method		
2458				K-S Test Statistic	0.712					Mean	0.0065	
2459				5% K-S Critical Value	0.339					SD	0.00676	
2460				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00218	
2461										95% KM (t) UCL	0.0103	
2462				**Assuming Gamma Distribution**						95% KM (z) UCL	0.0101	
2463				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0103	
2464				Minimum	0.00122					95% KM (bootstrap t) UCL	0.0119	
2465				Maximum	0.0223					95% KM (BCA) UCL	0.0113	
2466				Mean	0.0108					95% KM (Percentile Bootstrap) UCL	0.0106	
2467				Median	0.00954					95% KM (Chebyshev) UCL	0.016	
2468				SD	0.00648					97.5% KM (Chebyshev) UCL	0.0201	
2469				k star	1.819					99% KM (Chebyshev) UCL	0.0282	
2470				Theta star	0.00591							
2471				Nu star	50.93					**Potential UCLs to Use**		
2472				AppChi2	35.54					95% KM (t) UCL	0.0103	
2473				95% Gamma Approximate UCL	0.0154					95% KM (Percentile Bootstrap) UCL	0.0106	
2474				95% Adjusted Gamma UCL	0.0162							
2475	**Note: DL/2 is not a recommended method.**											
2476												
2477												
2478	**Nickel, dissolved (mw-34-80)**											
2479												
2480										**General Statistics**		
2481				Number of Valid Data	18					Number of Detected Data	11	
2482				Number of Distinct Detected Data	11					Number of Non-Detect Data	7	
2483										Percent Non-Detects	38.89%	
2484												
2485				**Raw Statistics**						**Log-transformed Statistics**		
2486				Minimum Detected	0.001					Minimum Detected	-6.908	
2487				Maximum Detected	0.0222					Maximum Detected	-3.808	
2488				Mean of Detected	0.00591					Mean of Detected	-5.686	
2489				SD of Detected	0.00697					SD of Detected	1.069	
2490				Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298	
2491				Maximum Non-Detect	0.0261					Maximum Non-Detect	-3.646	

2492												
2493	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	18
2494	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
2495	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
2496												
2497	**UCL Statistics**											
2498	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2499	Shapiro Wilk Test Statistic				0.739		Shapiro Wilk Test Statistic					0.898
2500	5% Shapiro Wilk Critical Value				0.85		5% Shapiro Wilk Critical Value					0.85
2501	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2502												
2503	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2504	DL/2 Substitution Method						DL/2 Substitution Method					
2505	Mean				0.00742		Mean					-5.313
2506	SD				0.00606		SD					1.009
2507	95% DL/2 (t) UCL				0.00991		95% H-Stat (DL/2) UCL					0.0274
2508												
2509	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
2510	**MLE method failed to converge properly**						Mean in Log Scale					-5.78
2511							SD in Log Scale					0.9
2512							Mean in Original Scale					0.00482
2513							SD in Original Scale					0.00564
2514							95% Percentile Bootstrap UCL					0.00706
2515							95% BCA Bootstrap UCL					0.00783
2516												
2517	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2518	k star (bias corrected)				0.814		**Data appear Gamma Distributed at 5% Significance Level**					
2519	Theta Star				0.00726							
2520	nu star				17.91							
2521												
2522	A-D Test Statistic				0.723		**Nonparametric Statistics**					
2523	5% A-D Critical Value				0.751		Kaplan-Meier (KM) Method					
2524	K-S Test Statistic				0.751		Mean					0.00519
2525	5% K-S Critical Value				0.262		SD					0.00603
2526	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00171
2527							95% KM (t) UCL					0.00817
2528	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00801
2529	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00818
2530	Minimum				1E-09		95% KM (bootstrap t) UCL					0.011
2531	Maximum				0.0222		95% KM (BCA) UCL					0.00814
2532	Mean				0.00578		95% KM (Percentile Bootstrap) UCL					0.00806
2533	Median				0.00311		95% KM (Chebyshev) UCL					0.0127
2534	SD				0.00599		97.5% KM (Chebyshev) UCL					0.0159
2535	k star				0.47		99% KM (Chebyshev) UCL					0.0222
2536	Theta star				0.0123							
2537	Nu star				16.93		**Potential UCLs to Use**					
2538	AppChi2				8.621		95% KM (BCA) UCL					0.00814
2539	95% Gamma Approximate UCL				0.0113							
2540	95% Adjusted Gamma UCL				0.0121							
2541	**Note: DL/2 is not a recommended method.**											
2542												
2543												
2544	**Nickel, dissolved (mw-35-135)**											

2545												
2546	**General Statistics**											
2547					Number of Valid Data	2			Number of Detected Data			1
2548					Number of Distinct Detected Data	1			Number of Non-Detect Data			1
2549									Percent Non-Detects			50.00%
2550												
2551	**Warning: This data set only has 2 observations!**											
2552	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2553	**The data set for variable Nickel, dissolved (mw-35-135) was not processed!**											
2554												
2555	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2556	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2557												
2558												
2559												
2560	**Nickel, dissolved (mw-35-60)**											
2561												
2562	**General Statistics**											
2563					Number of Valid Observations	1			Number of Distinct Observations			1
2564												
2565												
2566	**Warning: This data set only has 1 observations!**											
2567	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2568	**The data set for variable Nickel, dissolved (mw-35-60) was not processed!**											
2569												
2570	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2571	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2572												
2573												
2574												
2575	**Nickel, dissolved (mw-37d)**											
2576												
2577	**General Statistics**											
2578					Number of Valid Data	13			Number of Detected Data			4
2579					Number of Distinct Detected Data	4			Number of Non-Detect Data			9
2580									Percent Non-Detects			69.23%
2581												
2582					**Raw Statistics**				**Log-transformed Statistics**			
2583					Minimum Detected	0.0015			Minimum Detected			-6.502
2584					Maximum Detected	0.0254			Maximum Detected			-3.673
2585					Mean of Detected	0.0111			Mean of Detected			-4.914
2586					SD of Detected	0.0101			SD of Detected			1.173
2587					Minimum Non-Detect	0.001			Minimum Non-Detect			-6.908
2588					Maximum Non-Detect	0.02			Maximum Non-Detect			-3.912
2589												
2590	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			12
2591	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			1
2592	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			92.31%
2593												
2594	**Warning: There are only 4 Distinct Detected Values in this data**											
2595	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2596	**the resulting calculations may not be reliable enough tp draw conclusions**											
2597												

	A	B	C	D	E	F	G	H	I	J	K	L
2598	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2599												
2600												
2601	**UCL Statistics**											
2602	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2603	Shapiro Wilk Test Statistic					0.892	Shapiro Wilk Test Statistic					0.932
2604	5% Shapiro Wilk Critical Value					0.748	5% Shapiro Wilk Critical Value					0.748
2605	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2606												
2607	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2608	DL/2 Substitution Method						DL/2 Substitution Method					
2609	Mean					0.00553	Mean					-6.066
2610	SD					0.00717	SD					1.458
2611	95% DL/2 (t) UCL					0.00908	95% H-Stat (DL/2) UCL					0.017
2612												
2613	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2614	**MLE method failed to converge properly**						Mean in Log Scale					-6.915
2615							SD in Log Scale					1.701
2616							Mean in Original Scale					0.00382
2617							SD in Original Scale					0.00717
2618							95% Percentile Bootstrap UCL					0.00753
2619							95% BCA Bootstrap UCL					0.00919
2620												
2621	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2622	k star (bias corrected)					0.505	**Data appear Normal at 5% Significance Level**					
2623	Theta Star					0.022						
2624	nu star					4.039						
2625												
2626	A-D Test Statistic					0.292	**Nonparametric Statistics**					
2627	5% A-D Critical Value					0.664	Kaplan-Meier (KM) Method					
2628	K-S Test Statistic					0.664	Mean					0.00468
2629	5% K-S Critical Value					0.4	SD					0.0066
2630	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00215
2631							95% KM (t) UCL					0.00851
2632	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00822
2633	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00936
2634	Minimum					0.00146	95% KM (bootstrap t) UCL					0.00878
2635	Maximum					0.0529	95% KM (BCA) UCL					0.0254
2636	Mean					0.018	95% KM (Percentile Bootstrap) UCL					0.0122
2637	Median					0.0133	95% KM (Chebyshev) UCL					0.0141
2638	SD					0.0156	97.5% KM (Chebyshev) UCL					0.0181
2639	k star					1.011	99% KM (Chebyshev) UCL					0.0261
2640	Theta star					0.0178						
2641	Nu star					26.28	**Potential UCLs to Use**					
2642	AppChi2					15.59	95% KM (t) UCL					0.00851
2643	95% Gamma Approximate UCL					0.0304	95% KM (Percentile Bootstrap) UCL					0.0122
2644	95% Adjusted Gamma UCL					N/A						
2645	**Note: DL/2 is not a recommended method.**											
2646												
2647												
2648	**Nickel, dissolved (mw-37s)**											
2649												
2650	**General Statistics**											

2651				Number of Valid Data	1					Number of Detected Data	0	
2652				Number of Distinct Detected Data	0					Number of Non-Detect Data	1	
2653										Percent Non-Detects	100.00%	
2654												
2655												
2656												
2657												
2658												
2659												
2660												
2661												
2662												
2663												
2664	**Nickel, dissolved (mw-38d)**											
2665												
2666												
2667				Number of Valid Data	1					Number of Detected Data	0	
2668				Number of Distinct Detected Data	0					Number of Non-Detect Data	1	
2669										Percent Non-Detects	100.00%	
2670												
2671												
2672												
2673												
2674												
2675												
2676												
2677												
2678												
2679												
2680	**Nickel, dissolved (mw-38s)**											
2681												
2682												
2683				Number of Valid Data	1					Number of Detected Data	0	
2684				Number of Distinct Detected Data	0					Number of Non-Detect Data	1	
2685										Percent Non-Detects	100.00%	
2686												
2687												
2688												
2689												
2690												
2691												
2692												
2693												
2694												
2695												
2696	**Nickel, dissolved (mw-39-60)**											
2697												
2698												
2699				Number of Valid Observations	1					Number of Distinct Observations	1	
2700												
2701												
2702												
2703												

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Nickel, dissolved (mw-37s) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

General Statistics

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Nickel, dissolved (mw-38d) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

General Statistics

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Nickel, dissolved (mw-38s) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

General Statistics

2699				Number of Valid Observations	1					Number of Distinct Observations	1	

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

2704	The data set for variable Nickel, dissolved (mw-39-60) was not processed!											
2705												
2706	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2707	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2708												
2709												
2710												
2711	Nickel, dissolved (mw-4)											
2712												
2713	General Statistics											
2714					Number of Valid Observations	5			Number of Distinct Observations	5		
2715												
2716	Raw Statistics						Log-transformed Statistics					
2717					Minimum	0.00774			Minimum of Log Data	-4.861		
2718					Maximum	0.022			Maximum of Log Data	-3.817		
2719					Mean	0.0162			Mean of log Data	-4.189		
2720					Median	0.017			SD of log Data	0.427		
2721					SD	0.00587						
2722					Coefficient of Variation	0.363						
2723					Skewness	-0.661						
2724												
2725												
2726	Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!											
2727												
2728	It is suggested to collect at least 8 to 10 observations using these statistical methods!											
2729	If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2730												
2731												
2732	Warning: There are only 5 Values in this data											
2733	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
2734	the resulting calculations may not be reliable enough to draw conclusions											
2735												
2736	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
2737												
2738	Relevant UCL Statistics											
2739	Normal Distribution Test						Lognormal Distribution Test					
2740					Shapiro Wilk Test Statistic	0.936			Shapiro Wilk Test Statistic	0.892		
2741					Shapiro Wilk Critical Value	0.762			Shapiro Wilk Critical Value	0.762		
2742	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
2743												
2744	Assuming Normal Distribution						Assuming Lognormal Distribution					
2745					95% Student's-t UCL	0.0218			95% H-UCL	0.0297		
2746	95% UCLs (Adjusted for Skewness)								95% Chebyshev (MVUE) UCL	0.0298		
2747					95% Adjusted-CLT UCL	0.0197			97.5% Chebyshev (MVUE) UCL	0.0356		
2748					95% Modified-t UCL	0.0217			99% Chebyshev (MVUE) UCL	0.0471		
2749												
2750	Gamma Distribution Test						Data Distribution					
2751					k star (bias corrected)	3.266	Data appear Normal at 5% Significance Level					
2752					Theta Star	0.00496						
2753					nu star	32.66						
2754					Approximate Chi Square Value (.05)	20.6	Nonparametric Statistics					
2755					Adjusted Level of Significance	0.0086			95% CLT UCL	0.0205		
2756					Adjusted Chi Square Value	16.55			95% Jackknife UCL	0.0218		

2757											95% Standard Bootstrap UCL	0.02
2758				Anderson-Darling Test Statistic	0.329						95% Bootstrap-t UCL	0.0213
2759				Anderson-Darling 5% Critical Value	0.68						95% Hall's Bootstrap UCL	0.02
2760				Kolmogorov-Smirnov Test Statistic	0.21						95% Percentile Bootstrap UCL	0.02
2761				Kolmogorov-Smirnov 5% Critical Value	0.358						95% BCA Bootstrap UCL	0.0196
2762				**Data appear Gamma Distributed at 5% Significance Level**							95% Chebyshev(Mean, Sd) UCL	0.0276
2763											97.5% Chebyshev(Mean, Sd) UCL	0.0326
2764				**Assuming Gamma Distribution**							99% Chebyshev(Mean, Sd) UCL	0.0423
2765				95% Approximate Gamma UCL	0.0257							
2766				95% Adjusted Gamma UCL	0.032							
2767												
2768				**Potential UCL to Use**							Use 95% Student's-t UCL	0.0218
2769												
2770												
2771	**Nickel, dissolved (mw-40d)**											
2772												
2773					**General Statistics**							
2774				Number of Valid Observations	1						Number of Distinct Observations	1
2775												
2776												
2777					**Warning: This data set only has 1 observations!**							
2778					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
2779					**The data set for variable Nickel, dissolved (mw-40d) was not processed!**							
2780												
2781					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
2782					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
2783												
2784												
2785												
2786	**Nickel, dissolved (mw-40s)**											
2787												
2788					**General Statistics**							
2789				Number of Valid Data	1						Number of Detected Data	0
2790				Number of Distinct Detected Data	0						Number of Non-Detect Data	1
2791											Percent Non-Detects	100.00%
2792												
2793					**Warning: This data set only has 1 observations!**							
2794					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
2795					**The data set for variable Nickel, dissolved (mw-40s) was not processed!**							
2796												
2797					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
2798					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
2799												
2800												
2801												
2802	**Nickel, dissolved (mw-43-25)**											
2803												
2804					**General Statistics**							
2805				Number of Valid Data	3						Number of Detected Data	0
2806				Number of Distinct Detected Data	0						Number of Non-Detect Data	3
2807											Percent Non-Detects	100.00%
2808												
2809					**Warning: This data set only has 3 observations!**							

	A	B	C	D	E	F	G	H	I	J	K	L
2810	Data set is too small to compute reliable and meaningful statistics and estimates!											
2811	The data set for variable Nickel, dissolved (mw-43-25) was not processed!											
2812												
2813	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2814	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2815												
2816												
2817												
2818	Nickel, dissolved (mw-44-115)											
2819												
2820	General Statistics											
2821						Number of Valid Data	3			Number of Detected Data	0	
2822						Number of Distinct Detected Data	0			Number of Non-Detect Data	3	
2823										Percent Non-Detects	100.00%	
2824												
2825	Warning: This data set only has 3 observations!											
2826	Data set is too small to compute reliable and meaningful statistics and estimates!											
2827	The data set for variable Nickel, dissolved (mw-44-115) was not processed!											
2828												
2829	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2830	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2831												
2832												
2833												
2834	Nickel, dissolved (mw-44-125)											
2835												
2836	General Statistics											
2837						Number of Valid Data	1			Number of Detected Data	0	
2838						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
2839										Percent Non-Detects	100.00%	
2840												
2841	Warning: This data set only has 1 observations!											
2842	Data set is too small to compute reliable and meaningful statistics and estimates!											
2843	The data set for variable Nickel, dissolved (mw-44-125) was not processed!											
2844												
2845	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2846	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2847												
2848												
2849												
2850	Nickel, dissolved (mw-45-095a)											
2851												
2852	General Statistics											
2853						Number of Valid Data	1			Number of Detected Data	0	
2854						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
2855										Percent Non-Detects	100.00%	
2856												
2857	Warning: This data set only has 1 observations!											
2858	Data set is too small to compute reliable and meaningful statistics and estimates!											
2859	The data set for variable Nickel, dissolved (mw-45-095a) was not processed!											
2860												
2861	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2862	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											

	A	B	C	D	E	F	G	H	I	J	K	L
2863												
2864												
2865												
2866	**Nickel, dissolved (mw-46-175)**											
2867												
2868	**General Statistics**											
2869					Number of Valid Data	1			Number of Detected Data			0
2870					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
2871									Percent Non-Detects			100.00%
2872												
2873	**Warning: This data set only has 1 observations!**											
2874	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2875	**The data set for variable Nickel, dissolved (mw-46-175) was not processed!**											
2876												
2877	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2878	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2879												
2880												
2881												
2882	**Nickel, dissolved (mw-47-55)**											
2883												
2884	**General Statistics**											
2885					Number of Valid Data	1			Number of Detected Data			0
2886					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
2887									Percent Non-Detects			100.00%
2888												
2889	**Warning: This data set only has 1 observations!**											
2890	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2891	**The data set for variable Nickel, dissolved (mw-47-55) was not processed!**											
2892												
2893	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2894	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2895												
2896												
2897												
2898	**Nickel, dissolved (mw-48)**											
2899												
2900	**General Statistics**											
2901					Number of Valid Data	3			Number of Detected Data			0
2902					Number of Distinct Detected Data	0			Number of Non-Detect Data			3
2903									Percent Non-Detects			100.00%
2904												
2905	**Warning: This data set only has 3 observations!**											
2906	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2907	**The data set for variable Nickel, dissolved (mw-48) was not processed!**											
2908												
2909	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2910	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2911												
2912												
2913												
2914	**Nickel, dissolved (mw-5)**											
2915												

2916	**General Statistics**											
2917					Number of Valid Data	5				Number of Detected Data		4
2918					Number of Distinct Detected Data	4				Number of Non-Detect Data		1
2919										Percent Non-Detects		20.00%
2920												
2921	**Raw Statistics**							**Log-transformed Statistics**				
2922					Minimum Detected	0.00497				Minimum Detected		-5.304
2923					Maximum Detected	0.02				Maximum Detected		-3.912
2924					Mean of Detected	0.0135				Mean of Detected		-4.424
2925					SD of Detected	0.00636				SD of Detected		0.613
2926					Minimum Non-Detect	0.00646				Minimum Non-Detect		-5.042
2927					Maximum Non-Detect	0.00646				Maximum Non-Detect		-5.042
2928												
2929												
2930	**Warning: There are only 4 Distinct Detected Values in this data**											
2931	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2932	**the resulting calculations may not be reliable enough tp draw conclusions**											
2933												
2934	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2935												
2936												
2937	**UCL Statistics**											
2938	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
2939					Shapiro Wilk Test Statistic	0.966				Shapiro Wilk Test Statistic		0.872
2940					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value		0.748
2941	**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
2942												
2943	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
2944					DL/2 Substitution Method					DL/2 Substitution Method		
2945					Mean	0.0114				Mean		-4.686
2946					SD	0.00717				SD		0.791
2947					95% DL/2 (t) UCL	0.0183				95% H-Stat (DL/2) UCL		0.0259
2948												
2949					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
2950					Mean	0.0102				Mean in Log Scale		-4.583
2951					SD	0.00828				SD in Log Scale		0.639
2952					95% MLE (t) UCL	0.0181				Mean in Original Scale		0.0119
2953					95% MLE (Tiku) UCL	0.0193				SD in Original Scale		0.00659
2954										95% Percentile Bootstrap UCL		0.0162
2955										95% BCA Bootstrap UCL		0.0162
2956												
2957	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
2958					k star (bias corrected)	1.266		**Data appear Normal at 5% Significance Level**				
2959					Theta Star	0.0107						
2960					nu star	10.13						
2961												
2962					A-D Test Statistic	0.364		**Nonparametric Statistics**				
2963					5% A-D Critical Value	0.659				Kaplan-Meier (KM) Method		
2964					K-S Test Statistic	0.659				Mean		0.0118
2965					5% K-S Critical Value	0.396				SD		0.00599
2966	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.0031
2967										95% KM (t) UCL		0.0184
2968	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0169

2969	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL		0.019
2970					Minimum	0.00497				95% KM (bootstrap t) UCL		0.0156
2971					Maximum	0.02				95% KM (BCA) UCL		0.0176
2972					Mean	0.0126				95% KM (Percentile Bootstrap) UCL		0.0176
2973					Median	0.013				95% KM (Chebyshev) UCL		0.0253
2974					SD	0.00588				97.5% KM (Chebyshev) UCL		0.0311
2975					k star	2.066				99% KM (Chebyshev) UCL		0.0426
2976					Theta star	0.00609						
2977					Nu star	20.66				**Potential UCLs to Use**		
2978					AppChi2	11.34				95% KM (t) UCL		0.0184
2979				95% Gamma Approximate UCL		0.0229				95% KM (Percentile Bootstrap) UCL		0.0176
2980				95% Adjusted Gamma UCL		N/A						
2981	**Note: DL/2 is not a recommended method.**											
2982												
2983												
2984	**Nickel, dissolved (mw-50-200)**											
2985												
2986	**General Statistics**											
2987				Number of Valid Data		3				Number of Detected Data		0
2988				Number of Distinct Detected Data		0				Number of Non-Detect Data		3
2989										Percent Non-Detects		100.00%
2990												
2991	**Warning: This data set only has 3 observations!**											
2992	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2993	**The data set for variable Nickel, dissolved (mw-50-200) was not processed!**											
2994												
2995	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2996	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2997												
2998												
2999												
3000	**Nickel, dissolved (mw-51)**											
3001												
3002	**General Statistics**											
3003				Number of Valid Data		3				Number of Detected Data		0
3004				Number of Distinct Detected Data		0				Number of Non-Detect Data		3
3005										Percent Non-Detects		100.00%
3006												
3007	**Warning: This data set only has 3 observations!**											
3008	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3009	**The data set for variable Nickel, dissolved (mw-51) was not processed!**											
3010												
3011	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3012	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3013												
3014												
3015												
3016	**Nickel, dissolved (mw-6)**											
3017												
3018	**General Statistics**											
3019				Number of Valid Data		5				Number of Detected Data		1
3020				Number of Distinct Detected Data		1				Number of Non-Detect Data		4
3021										Percent Non-Detects		80.00%

	A	B	C	D	E	F	G	H	I	J	K	L
3022												
3023	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
3024	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
3025												
3026	**The data set for variable Nickel, dissolved (mw-6) was not processed!**											
3027												
3028												
3029												
3030	**Nickel, dissolved (mw-7)**											
3031												
3032	**General Statistics**											
3033	Number of Valid Observations					5	Number of Distinct Observations					5
3034												
3035	**Raw Statistics**						**Log-transformed Statistics**					
3036	Minimum					0.00529	Minimum of Log Data					-5.242
3037	Maximum					0.02	Maximum of Log Data					-3.912
3038	Mean					0.0115	Mean of log Data					-4.566
3039	Median					0.011	SD of log Data					0.501
3040	SD					0.0056						
3041	Coefficient of Variation					0.488						
3042	Skewness					0.83						
3043												
3044												
3045	**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
3046												
3047	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
3048	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3049												
3050												
3051	**Warning: There are only 5 Values in this data**											
3052	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
3053	**the resulting calculations may not be reliable enough to draw conclusions**											
3054												
3055	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
3056												
3057	**Relevant UCL Statistics**											
3058	**Normal Distribution Test**						**Lognormal Distribution Test**					
3059	Shapiro Wilk Test Statistic					0.961	Shapiro Wilk Test Statistic					0.996
3060	Shapiro Wilk Critical Value					0.762	Shapiro Wilk Critical Value					0.762
3061	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3062												
3063	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3064	95% Student's-t UCL					0.0168	95% H-UCL					0.0247
3065	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0226
3066	95% Adjusted-CLT UCL					0.0166	97.5% Chebyshev (MVUE) UCL					0.0274
3067	95% Modified-t UCL					0.017	99% Chebyshev (MVUE) UCL					0.0368
3068												
3069	**Gamma Distribution Test**						**Data Distribution**					
3070	k star (bias corrected)					2.245	**Data appear Normal at 5% Significance Level**					
3071	Theta Star					0.00511						
3072	nu star					22.45						
3073	Approximate Chi Square Value (.05)					12.68	**Nonparametric Statistics**					
3074	Adjusted Level of Significance					0.0086	95% CLT UCL					0.0156

3075				Adjusted Chi Square Value	9.624					95% Jackknife UCL	0.0168	
3076										95% Standard Bootstrap UCL	0.0152	
3077				Anderson-Darling Test Statistic	0.171					95% Bootstrap-t UCL	0.0183	
3078				Anderson-Darling 5% Critical Value	0.681					95% Hall's Bootstrap UCL	0.0254	
3079				Kolmogorov-Smirnov Test Statistic	0.139					95% Percentile Bootstrap UCL	0.0154	
3080				Kolmogorov-Smirnov 5% Critical Value	0.358					95% BCA Bootstrap UCL	0.0158	
3081				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0224	
3082										97.5% Chebyshev(Mean, Sd) UCL	0.0271	
3083				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0364	
3084				95% Approximate Gamma UCL	0.0203							
3085				95% Adjusted Gamma UCL	0.0267							
3086												
3087				**Potential UCL to Use**						Use 95% Student's-t UCL	0.0168	
3088												
3089												
3090	**Nickel, dissolved (mw-8)**											
3091												
3092					**General Statistics**							
3093				Number of Valid Data	5					Number of Detected Data	4	
3094				Number of Distinct Detected Data	4					Number of Non-Detect Data	1	
3095										Percent Non-Detects	20.00%	
3096												
3097				**Raw Statistics**						**Log-transformed Statistics**		
3098				Minimum Detected	0.00246					Minimum Detected	-6.008	
3099				Maximum Detected	0.016					Maximum Detected	-4.135	
3100				Mean of Detected	0.0109					Mean of Detected	-4.737	
3101				SD of Detected	0.00619					SD of Detected	0.872	
3102				Minimum Non-Detect	0.00549					Minimum Non-Detect	-5.205	
3103				Maximum Non-Detect	0.00549					Maximum Non-Detect	-5.205	
3104												
3105												
3106					**Warning: There are only 4 Distinct Detected Values in this data**							
3107					**Note: It should be noted that even though bootstrap may be performed on this data set**							
3108					**the resulting calculations may not be reliable enough tp draw conclusions**							
3109												
3110					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
3111												
3112												
3113					**UCL Statistics**							
3114				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
3115				Shapiro Wilk Test Statistic	0.896					Shapiro Wilk Test Statistic	0.804	
3116				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748	
3117				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
3118												
3119				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
3120				DL/2 Substitution Method						DL/2 Substitution Method		
3121				Mean	0.00924					Mean	-4.969	
3122				SD	0.00647					SD	0.917	
3123				95% DL/2 (t) UCL	0.0154					95% H-Stat (DL/2) UCL	0.0322	
3124												
3125				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
3126				Mean	0.0137					Mean in Log Scale	-4.958	
3127				SD	0.00262					SD in Log Scale	0.903	

3128				95% MLE (t) UCL	0.0162					Mean in Original Scale		0.00927
3129				95% MLE (Tiku) UCL	0.0169					SD in Original Scale		0.00643
3130										95% Percentile Bootstrap UCL		0.0132
3131										95% BCA Bootstrap UCL		0.013
3132												
3133	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
3134				k star (bias corrected)	0.787					**Data appear Normal at 5% Significance Level**		
3135				Theta Star	0.0138							
3136				nu star	6.299							
3137												
3138				A-D Test Statistic	0.486					**Nonparametric Statistics**		
3139				5% A-D Critical Value	0.66					Kaplan-Meier (KM) Method		
3140				K-S Test Statistic	0.66					Mean		0.00918
3141				5% K-S Critical Value	0.397					SD		0.00585
3142	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.00302
3143										95% KM (t) UCL		0.0156
3144	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0142
3145				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0162
3146				Minimum	0.00246					95% KM (bootstrap t) UCL		0.0135
3147				Maximum	0.016					95% KM (BCA) UCL		0.0154
3148				Mean	0.00999					95% KM (Percentile Bootstrap) UCL		0.0152
3149				Median	0.01					95% KM (Chebyshev) UCL		0.0224
3150				SD	0.0057					97.5% KM (Chebyshev) UCL		0.0281
3151				k star	1.244					99% KM (Chebyshev) UCL		0.0393
3152				Theta star	0.00803							
3153				Nu star	12.44					**Potential UCLs to Use**		
3154				AppChi2	5.515					95% KM (t) UCL		0.0156
3155				95% Gamma Approximate UCL	0.0225					95% KM (Percentile Bootstrap) UCL		0.0152
3156				95% Adjusted Gamma UCL	N/A							
3157	**Note: DL/2 is not a recommended method.**											
3158												
3159												
3160	**Nickel, dissolved (mw-9)**											
3161												
3162	**General Statistics**											
3163				Number of Valid Data	27					Number of Detected Data		15
3164				Number of Distinct Detected Data	14					Number of Non-Detect Data		12
3165										Percent Non-Detects		44.44%
3166												
3167	**Raw Statistics**									**Log-transformed Statistics**		
3168				Minimum Detected	0.0014					Minimum Detected		-6.571
3169				Maximum Detected	0.0297					Maximum Detected		-3.517
3170				Mean of Detected	0.00675					Mean of Detected		-5.46
3171				SD of Detected	0.00784					SD of Detected		0.935
3172				Minimum Non-Detect	0.005					Minimum Non-Detect		-5.298
3173				Maximum Non-Detect	0.0278					Maximum Non-Detect		-3.583
3174												
3175	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		26
3176	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
3177	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		96.30%
3178												
3179	**UCL Statistics**											
3180	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		

3181					Shapiro Wilk Test Statistic	0.699					Shapiro Wilk Test Statistic	0.909
3182					5% Shapiro Wilk Critical Value	0.881					5% Shapiro Wilk Critical Value	0.881
3183					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
3184												
3185					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3186					DL/2 Substitution Method						DL/2 Substitution Method	
3187					Mean	0.00814					Mean	-5.145
3188					SD	0.00656					SD	0.872
3189					95% DL/2 (t) UCL	0.0103					95% H-Stat (DL/2) UCL	0.0164
3190												
3191					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3192					**MLE method failed to converge properly**						Mean in Log Scale	-5.574
3193											SD in Log Scale	0.747
3194											Mean in Original Scale	0.00533
3195											SD in Original Scale	0.00606
3196											95% Percentile Bootstrap UCL	0.00745
3197											95% BCA Bootstrap UCL	0.00804
3198												
3199					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
3200					k star (bias corrected)	1.023					**Data appear Lognormal at 5% Significance Level**	
3201					Theta Star	0.0066						
3202					nu star	30.68						
3203												
3204					A-D Test Statistic	0.912					**Nonparametric Statistics**	
3205					5% A-D Critical Value	0.759					Kaplan-Meier (KM) Method	
3206					K-S Test Statistic	0.759					Mean	0.00559
3207					5% K-S Critical Value	0.227					SD	0.00635
3208					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00141
3209											95% KM (t) UCL	0.008
3210					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00791
3211					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00799
3212					Minimum	0.0014					95% KM (bootstrap t) UCL	0.01
3213					Maximum	0.0297					95% KM (BCA) UCL	0.00826
3214					Mean	0.007					95% KM (Percentile Bootstrap) UCL	0.00801
3215					Median	0.005					95% KM (Chebyshev) UCL	0.0117
3216					SD	0.00621					97.5% KM (Chebyshev) UCL	0.0144
3217					k star	1.591					99% KM (Chebyshev) UCL	0.0196
3218					Theta star	0.0044						
3219					Nu star	85.94					**Potential UCLs to Use**	
3220					AppChi2	65.57					95% KM (t) UCL	0.008
3221					95% Gamma Approximate UCL	0.00917					95% KM (% Bootstrap) UCL	0.00801
3222					95% Adjusted Gamma UCL	0.00933						
3223	**Note: DL/2 is not a recommended method.**											
3224												
3225												
3226	**Nickel, dissolved (ow-1d)**											
3227												
3228						**General Statistics**							
3229					Number of Valid Data	15					Number of Detected Data	3
3230					Number of Distinct Detected Data	3					Number of Non-Detect Data	12
3231											Percent Non-Detects	80.00%
3232												
3233					**Raw Statistics**						**Log-transformed Statistics**	

3234				Minimum Detected	0.00105					Minimum Detected	-6.859	
3235				Maximum Detected	0.0095					Maximum Detected	-4.656	
3236				Mean of Detected	0.00397					Mean of Detected	-6.039	
3237				SD of Detected	0.00479					SD of Detected	1.204	
3238				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
3239				Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912	
3240												
3241	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	15	
3242	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
3243	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
3244												
3245	**Warning: There are only 3 Distinct Detected Values in this data set**											
3246	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3247	**Those methods will return a 'N/A' value on your output display!**											
3248												
3249	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
3250	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
3251												
3252												
3253	**UCL Statistics**											
3254	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
3255				Shapiro Wilk Test Statistic	0.777					Shapiro Wilk Test Statistic	0.837	
3256				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
3257	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
3258												
3259	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
3260				DL/2 Substitution Method						DL/2 Substitution Method		
3261				Mean	0.00616					Mean	-5.461	
3262				SD	0.00422					SD	1.026	
3263				95% DL/2 (t) UCL	0.00808					95% H-Stat (DL/2) UCL	0.0304	
3264												
3265				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3266	**MLE method failed to converge properly**									Mean in Log Scale	-6.985	
3267										SD in Log Scale	1.165	
3268										Mean in Original Scale	0.00178	
3269										SD in Original Scale	0.00246	
3270										95% Percentile Bootstrap UCL	0.00283	
3271										95% BCA Bootstrap UCL	0.00341	
3272												
3273	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
3274				k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**		
3275				Theta Star	N/A							
3276				nu star	N/A							
3277												
3278				A-D Test Statistic	0.516					**Nonparametric Statistics**		
3279				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
3280				K-S Test Statistic	N/A					Mean	0.0022	
3281				5% K-S Critical Value	N/A					SD	0.00276	
3282	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0012	
3283										95% KM (t) UCL	0.00431	
3284	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00417	
3285				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00403	
3286				Minimum	N/A					95% KM (bootstrap t) UCL	0.0223	

3287					Maximum	N/A					95% KM (BCA) UCL	0.0095
3288					Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
3289					Median	N/A					95% KM (Chebyshev) UCL	0.00742
3290					SD	N/A					97.5% KM (Chebyshev) UCL	0.00968
3291					k star	N/A					99% KM (Chebyshev) UCL	0.0141
3292					Theta star	N/A						
3293					Nu star	N/A					**Potential UCLs to Use**	
3294					AppChi2	N/A					95% KM (t) UCL	0.00431
3295					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	N/A
3296					95% Adjusted Gamma UCL	N/A						
3297	**Note: DL/2 is not a recommended method.**											
3298												
3299												
3300	**Nickel, dissolved (ow-1m)**											
3301												
3302					**General Statistics**							
3303					Number of Valid Data	15					Number of Detected Data	1
3304					Number of Distinct Detected Data	1					Number of Non-Detect Data	14
3305											Percent Non-Detects	93.33%
3306												
3307	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
3308	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
3309												
3310	**The data set for variable Nickel, dissolved (ow-1m) was not processed!**											
3311												
3312												
3313												
3314	**Nickel, dissolved (ow-1s)**											
3315												
3316					**General Statistics**							
3317					Number of Valid Data	13					Number of Detected Data	6
3318					Number of Distinct Detected Data	6					Number of Non-Detect Data	7
3319											Percent Non-Detects	53.85%
3320												
3321					**Raw Statistics**						**Log-transformed Statistics**	
3322					Minimum Detected	0.00173					Minimum Detected	-6.36
3323					Maximum Detected	0.0103					Maximum Detected	-4.576
3324					Mean of Detected	0.00636					Mean of Detected	-5.213
3325					SD of Detected	0.00322					SD of Detected	0.673
3326					Minimum Non-Detect	0.02					Minimum Non-Detect	-3.912
3327					Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912
3328												
3329												
3330	**Warning: There are only 6 Detected Values in this data**											
3331	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3332	**the resulting calculations may not be reliable enough tp draw conclusions**											
3333												
3334	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3335												
3336												
3337					**UCL Statistics**							
3338					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
3339					Shapiro Wilk Test Statistic	0.962					Shapiro Wilk Test Statistic	0.886

3340				5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
3341	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3342												
3343	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3344				DL/2 Substitution Method						DL/2 Substitution Method		
3345				Mean	0.00832					Mean	-4.886	
3346				SD	0.00281					SD	0.537	
3347				95% DL/2 (t) UCL	0.00971					95% H-Stat (DL/2) UCL	0.0254	
3348												
3349				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3350	**MLE method failed to converge properly**									Mean in Log Scale	-5.213	
3351										SD in Log Scale	0.632	
3352										Mean in Original Scale	0.00643	
3353										SD in Original Scale	0.00358	
3354										95% Percentile Bootstrap UCL	0.00806	
3355										95% BCA Bootstrap UCL	0.00823	
3356												
3357	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3358				k star (bias corrected)	1.809		**Data appear Normal at 5% Significance Level**					
3359				Theta Star	0.00351							
3360				nu star	21.7							
3361												
3362				A-D Test Statistic	0.345		**Nonparametric Statistics**					
3363				5% A-D Critical Value	0.701					Kaplan-Meier (KM) Method		
3364				K-S Test Statistic	0.701					Mean	0.00636	
3365				5% K-S Critical Value	0.334					SD	0.00294	
3366	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00131	
3367										95% KM (t) UCL	0.0087	
3368	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00852	
3369				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00882	
3370				Minimum	0.00137					95% KM (bootstrap t) UCL	0.00862	
3371				Maximum	0.0105					95% KM (BCA) UCL	0.00838	
3372				Mean	0.00635					95% KM (Percentile Bootstrap) UCL	0.00843	
3373				Median	0.00663					95% KM (Chebyshev) UCL	0.0121	
3374				SD	0.0031					97.5% KM (Chebyshev) UCL	0.0146	
3375				k star	2.539					99% KM (Chebyshev) UCL	0.0194	
3376				Theta star	0.0025							
3377				Nu star	66.02		**Potential UCLs to Use**					
3378				AppChi2	48.33					95% KM (t) UCL	0.0087	
3379				95% Gamma Approximate UCL	0.00867					95% KM (Percentile Bootstrap) UCL	0.00843	
3380				95% Adjusted Gamma UCL	0.00908							
3381	**Note: DL/2 is not a recommended method.**											
3382												
3383												
3384	**Nickel, dissolved (ow-2d)**											
3385												
3386	**General Statistics**											
3387				Number of Valid Data	14					Number of Detected Data	3	
3388				Number of Distinct Detected Data	3					Number of Non-Detect Data	11	
3389										Percent Non-Detects	78.57%	
3390												
3391	**Raw Statistics**						**Log-transformed Statistics**					
3392				Minimum Detected	0.00102					Minimum Detected	-6.888	

3393				Maximum Detected	0.0135					Maximum Detected	-4.305	
3394				Mean of Detected	0.00707					Mean of Detected	-5.4	
3395				SD of Detected	0.00625					SD of Detected	1.336	
3396				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
3397				Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912	
3398												
3399	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	14	
3400	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
3401	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
3402												
3403	**Warning: There are only 3 Distinct Detected Values in this data set**											
3404	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3405	**Those methods will return a 'N/A' value on your output display!**											
3406												
3407	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
3408	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
3409												
3410												
3411	**UCL Statistics**											
3412	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
3413				Shapiro Wilk Test Statistic	0.997					Shapiro Wilk Test Statistic	0.935	
3414				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
3415	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
3416												
3417	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
3418				DL/2 Substitution Method						DL/2 Substitution Method		
3419				Mean	0.00694					Mean	-5.401	
3420				SD	0.00452					SD	1.189	
3421				95% DL/2 (t) UCL	0.00909					95% H-Stat (DL/2) UCL	0.0433	
3422												
3423				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3424	**MLE method failed to converge properly**									Mean in Log Scale	-7.356	
3425										SD in Log Scale	1.934	
3426										Mean in Original Scale	0.00273	
3427										SD in Original Scale	0.00435	
3428										95% Percentile Bootstrap UCL	0.00469	
3429										95% BCA Bootstrap UCL	0.00509	
3430												
3431	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
3432				k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**		
3433				Theta Star	N/A							
3434				nu star	N/A							
3435												
3436				A-D Test Statistic	0.286					**Nonparametric Statistics**		
3437				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
3438				K-S Test Statistic	N/A					Mean	0.00361	
3439				5% K-S Critical Value	N/A					SD	0.00449	
3440	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00208	
3441										95% KM (t) UCL	0.00729	
3442	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00703	
3443				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00783	
3444				Minimum	N/A					95% KM (bootstrap t) UCL	0.00676	
3445				Maximum	N/A					95% KM (BCA) UCL	0.0135	

3446					Mean	N/A				95% KM (Percentile Bootstrap) UCL		N/A
3447					Median	N/A				95% KM (Chebyshev) UCL		0.0127
3448					SD	N/A				97.5% KM (Chebyshev) UCL		0.0166
3449					k star	N/A				99% KM (Chebyshev) UCL		0.0243
3450					Theta star	N/A						
3451					Nu star	N/A				**Potential UCLs to Use**		
3452					AppChi2	N/A				95% KM (t) UCL		0.00729
3453					95% Gamma Approximate UCL	N/A				95% KM (Percentile Bootstrap) UCL		N/A
3454					95% Adjusted Gamma UCL	N/A						
3455	**Note: DL/2 is not a recommended method.**											
3456												
3457												
3458	**Nickel, dissolved (ow-2m)**											
3459												
3460	**General Statistics**											
3461					Number of Valid Data	13				Number of Detected Data		1
3462					Number of Distinct Detected Data	1				Number of Non-Detect Data		12
3463										Percent Non-Detects		92.31%
3464												
3465	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
3466	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
3467												
3468	**The data set for variable Nickel, dissolved (ow-2m) was not processed!**											
3469												
3470												
3471												
3472	**Nickel, dissolved (ow-2s)**											
3473												
3474	**General Statistics**											
3475					Number of Valid Data	13				Number of Detected Data		1
3476					Number of Distinct Detected Data	1				Number of Non-Detect Data		12
3477										Percent Non-Detects		92.31%
3478												
3479	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
3480	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
3481												
3482	**The data set for variable Nickel, dissolved (ow-2s) was not processed!**											
3483												
3484												
3485												
3486	**Nickel, dissolved (ow-3d)**											
3487												
3488	**General Statistics**											
3489					Number of Valid Data	2				Number of Detected Data		0
3490					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
3491										Percent Non-Detects		100.00%
3492												
3493	**Warning: This data set only has 2 observations!**											
3494	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3495	**The data set for variable Nickel, dissolved (ow-3d) was not processed!**											
3496												
3497	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3498	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											

	A	B	C	D	E	F	G	H	I	J	K	L
3499												
3500												
3501												
3502	**Nickel, dissolved (ow-3m)**											
3503												
3504						**General Statistics**							
3505						Number of Valid Data	4			Number of Detected Data		0
3506						Number of Distinct Detected Data	0			Number of Non-Detect Data		4
3507										Percent Non-Detects		100.00%
3508												
3509						**Warning: This data set only has 4 observations!**							
3510						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
3511						**The data set for variable Nickel, dissolved (ow-3m) was not processed!**						
3512												
3513						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
3514						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
3515												
3516												
3517												
3518	**Nickel, dissolved (ow-3s)**											
3519												
3520						**General Statistics**							
3521						Number of Valid Data	3			Number of Detected Data		1
3522						Number of Distinct Detected Data	1			Number of Non-Detect Data		2
3523										Percent Non-Detects		66.67%
3524												
3525						**Warning: This data set only has 3 observations!**							
3526						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
3527						**The data set for variable Nickel, dissolved (ow-3s) was not processed!**						
3528												
3529						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
3530						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
3531												
3532												
3533												
3534	**Nickel, dissolved (ow-5d)**											
3535												
3536						**General Statistics**							
3537						Number of Valid Data	14			Number of Detected Data		6
3538						Number of Distinct Detected Data	6			Number of Non-Detect Data		8
3539										Percent Non-Detects		57.14%
3540												
3541						**Raw Statistics**				**Log-transformed Statistics**		
3542						Minimum Detected	0.001			Minimum Detected		-6.908
3543						Maximum Detected	0.0097			Maximum Detected		-4.636
3544						Mean of Detected	0.00582			Mean of Detected		-5.381
3545						SD of Detected	0.00343			SD of Detected		0.861
3546						Minimum Non-Detect	0.001			Minimum Non-Detect		-6.908
3547						Maximum Non-Detect	0.02			Maximum Non-Detect		-3.912
3548												
3549	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
3550	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
3551	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%

3552												
3553	**Warning: There are only 6 Detected Values in this data**											
3554	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3555	**the resulting calculations may not be reliable enough tp draw conclusions**											
3556												
3557	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3558												
3559												
3560	**UCL Statistics**											
3561	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3562				Shapiro Wilk Test Statistic	0.943					Shapiro Wilk Test Statistic	0.869	
3563				5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788	
3564	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3565												
3566	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3567				DL/2 Substitution Method						DL/2 Substitution Method		
3568				Mean	0.00753					Mean	-5.152	
3569				SD	0.0036					SD	0.965	
3570				95% DL/2 (t) UCL	0.00923					95% H-Stat (DL/2) UCL	0.0383	
3571												
3572				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3573	**MLE method failed to converge properly**									Mean in Log Scale	-5.655	
3574										SD in Log Scale	0.983	
3575										Mean in Original Scale	0.00508	
3576										SD in Original Scale	0.00402	
3577										95% Percentile Bootstrap UCL	0.00677	
3578										95% BCA Bootstrap UCL	0.0069	
3579												
3580	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3581				k star (bias corrected)	1.255		**Data appear Normal at 5% Significance Level**					
3582				Theta Star	0.00464							
3583				nu star	15.06							
3584												
3585				A-D Test Statistic	0.338		**Nonparametric Statistics**					
3586				5% A-D Critical Value	0.703					Kaplan-Meier (KM) Method		
3587				K-S Test Statistic	0.703					Mean	0.00513	
3588				5% K-S Critical Value	0.335					SD	0.00336	
3589	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00139	
3590										95% KM (t) UCL	0.00759	
3591	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00741	
3592				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00765	
3593				Minimum	0.0006128					95% KM (bootstrap t) UCL	0.00756	
3594				Maximum	0.0114					95% KM (BCA) UCL	0.00793	
3595				Mean	0.00586					95% KM (Percentile Bootstrap) UCL	0.0076	
3596				Median	0.00595					95% KM (Chebyshev) UCL	0.0112	
3597				SD	0.00357					97.5% KM (Chebyshev) UCL	0.0138	
3598				k star	1.528					99% KM (Chebyshev) UCL	0.019	
3599				Theta star	0.00383							
3600				Nu star	42.8		**Potential UCLs to Use**					
3601				AppChi2	28.8					95% KM (t) UCL	0.00759	
3602				95% Gamma Approximate UCL	0.00871					95% KM (Percentile Bootstrap) UCL	0.0076	
3603				95% Adjusted Gamma UCL	0.00919							
3604	**Note: DL/2 is not a recommended method.**											

	A	B	C	D	E	F	G	H	I	J	K	L
3605												
3606												
3607	**Nickel, dissolved (ow-5m)**											
3608												
3609						**General Statistics**						
3610					Number of Valid Data	14			Number of Detected Data			4
3611					Number of Distinct Detected Data	4			Number of Non-Detect Data			10
3612									Percent Non-Detects			71.43%
3613												
3614					**Raw Statistics**				**Log-transformed Statistics**			
3615					Minimum Detected	0.00128			Minimum Detected			-6.661
3616					Maximum Detected	0.0201			Maximum Detected			-3.907
3617					Mean of Detected	0.00727			Mean of Detected			-5.465
3618					SD of Detected	0.00873			SD of Detected			1.195
3619					Minimum Non-Detect	0.001			Minimum Non-Detect			-6.908
3620					Maximum Non-Detect	0.02			Maximum Non-Detect			-3.912
3621												
3622	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			13
3623	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			1
3624	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			92.86%
3625												
3626					**Warning: There are only 4 Distinct Detected Values in this data**							
3627					**Note: It should be noted that even though bootstrap may be performed on this data set**							
3628					**the resulting calculations may not be reliable enough tp draw conclusions**							
3629												
3630					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
3631												
3632												
3633						**UCL Statistics**						
3634					**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**			
3635					Shapiro Wilk Test Statistic	0.792			Shapiro Wilk Test Statistic			0.967
3636					5% Shapiro Wilk Critical Value	0.748			5% Shapiro Wilk Critical Value			0.748
3637					**Data appear Normal at 5% Significance Level**				**Data appear Lognormal at 5% Significance Level**			
3638												
3639					**Assuming Normal Distribution**				**Assuming Lognormal Distribution**			
3640					DL/2 Substitution Method				DL/2 Substitution Method			
3641					Mean	0.00747			Mean			-5.263
3642					SD	0.00535			SD			1.038
3643					95% DL/2 (t) UCL	0.01			95% H-Stat (DL/2) UCL			0.0296
3644												
3645					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
3646					**MLE method failed to converge properly**				Mean in Log Scale			-6.422
3647									SD in Log Scale			1.154
3648									Mean in Original Scale			0.00324
3649									SD in Original Scale			0.00512
3650									95% Percentile Bootstrap UCL			0.00578
3651									95% BCA Bootstrap UCL			0.0071
3652												
3653					**Gamma Distribution Test with Detected Values Only**				**Data Distribution Test with Detected Values Only**			
3654					k star (bias corrected)	0.431			**Data appear Normal at 5% Significance Level**			
3655					Theta Star	0.0169						
3656					nu star	3.452						
3657												

3658				A-D Test Statistic	0.328		**Nonparametric Statistics**					
3659				5% A-D Critical Value	0.666					Kaplan-Meier (KM) Method		
3660				K-S Test Statistic	0.666					Mean		0.00353
3661				5% K-S Critical Value	0.402					SD		0.00481
3662			**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean		0.00157
3663										95% KM (t) UCL		0.0063
3664			**Assuming Gamma Distribution**							95% KM (z) UCL		0.0061
3665			Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL		0.00595
3666				Minimum	0.0002018					95% KM (bootstrap t) UCL		0.00863
3667				Maximum	0.0201					95% KM (BCA) UCL		N/A
3668				Mean	0.00661					95% KM (Percentile Bootstrap) UCL		0.0075
3669				Median	0.00631					95% KM (Chebyshev) UCL		0.0104
3670				SD	0.00487					97.5% KM (Chebyshev) UCL		0.0133
3671				k star	1.219					99% KM (Chebyshev) UCL		0.0191
3672				Theta star	0.00543							
3673				Nu star	34.13		**Potential UCLs to Use**					
3674				AppChi2	21.77					95% KM (t) UCL		0.0063
3675				95% Gamma Approximate UCL	0.0104					95% KM (Percentile Bootstrap) UCL		0.0075
3676				95% Adjusted Gamma UCL	N/A							
3677	**Note: DL/2 is not a recommended method.**											
3678												
3679												
3680	**Nickel, dissolved (ow-5s)**											
3681												
3682					**General Statistics**							
3683				Number of Valid Data	14					Number of Detected Data		3
3684				Number of Distinct Detected Data	3					Number of Non-Detect Data		11
3685										Percent Non-Detects		78.57%
3686												
3687			**Raw Statistics**				**Log-transformed Statistics**					
3688				Minimum Detected	0.003					Minimum Detected		-5.809
3689				Maximum Detected	0.00529					Maximum Detected		-5.242
3690				Mean of Detected	0.0044					Mean of Detected		-5.457
3691				SD of Detected	0.00123					SD of Detected		0.308
3692				Minimum Non-Detect	0.005					Minimum Non-Detect		-5.298
3693				Maximum Non-Detect	0.02					Maximum Non-Detect		-3.912
3694												
3695	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
3696	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
3697	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
3698												
3699	**Warning: There are only 3 Distinct Detected Values in this data set**											
3700	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3701	**Those methods will return a 'N/A' value on your output display!**											
3702												
3703	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
3704	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
3705												
3706												
3707					**UCL Statistics**							
3708			**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**					
3709				Shapiro Wilk Test Statistic	0.873					Shapiro Wilk Test Statistic		0.849
3710				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value		0.767

3711	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
3712												
3713	Assuming Normal Distribution						Assuming Lognormal Distribution					
3714				DL/2 Substitution Method						DL/2 Substitution Method		
3715				Mean	0.00666					Mean	-5.184	
3716				SD	0.00357					SD	0.642	
3717				95% DL/2 (t) UCL	0.00835					95% H-Stat (DL/2) UCL	0.0144	
3718												
3719				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3720	MLE method failed to converge properly									Mean in Log Scale	-5.544	
3721										SD in Log Scale	0.205	
3722										Mean in Original Scale	0.00399	
3723										SD in Original Scale	0.0008138	
3724										95% Percentile Bootstrap UCL	0.00433	
3725										95% BCA Bootstrap UCL	0.00435	
3726												
3727	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
3728				k star (bias corrected)	N/A		Data appear Normal at 5% Significance Level					
3729				Theta Star	N/A							
3730				nu star	N/A							
3731												
3732				A-D Test Statistic	0.453		Nonparametric Statistics					
3733				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
3734				K-S Test Statistic	N/A					Mean	0.00414	
3735				5% K-S Critical Value	N/A					SD	0.0009967	
3736	Data not Gamma Distributed at 5% Significance Level									SE of Mean	0.0007378	
3737										95% KM (t) UCL	0.00545	
3738	Assuming Gamma Distribution									95% KM (z) UCL	0.00536	
3739				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00608	
3740				Minimum	N/A					95% KM (bootstrap t) UCL	0.00562	
3741				Maximum	N/A					95% KM (BCA) UCL	0.00529	
3742				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00529	
3743				Median	N/A					95% KM (Chebyshev) UCL	0.00736	
3744				SD	N/A					97.5% KM (Chebyshev) UCL	0.00875	
3745				k star	N/A					99% KM (Chebyshev) UCL	0.0115	
3746				Theta star	N/A							
3747				Nu star	N/A		Potential UCLs to Use					
3748				AppChi2	N/A					95% KM (t) UCL	0.00545	
3749				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.00529	
3750				95% Adjusted Gamma UCL	N/A							
3751	Warning: Recommended UCL exceeds the maximum observation											
3752	Note: DL/2 is not a recommended method.											
3753												
3754												
3755	Nickel, dissolved (park moabi-4)											
3756												
3757	General Statistics											
3758				Number of Valid Observations	1					Number of Distinct Observations	1	
3759												
3760												
3761	Warning: This data set only has 1 observations!											
3762	Data set is too small to compute reliable and meaningful statistics and estimates!											
3763	The data set for variable Nickel, dissolved (park moabi-4) was not processed!											

	A	B	C	D	E	F	G	H	I	J	K	L
3764												
3765	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3766	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3767												
3768												
3769												
3770	**Nickel, dissolved (pge-6)**											
3771												
3772	**General Statistics**											
3773					Number of Valid Data	17			Number of Detected Data			10
3774					Number of Distinct Detected Data	9			Number of Non-Detect Data			7
3775									Percent Non-Detects			41.18%
3776												
3777	**Raw Statistics**						**Log-transformed Statistics**					
3778					Minimum Detected	0.00091			Minimum Detected			-7.002
3779					Maximum Detected	0.014			Maximum Detected			-4.269
3780					Mean of Detected	0.00406			Mean of Detected			-5.869
3781					SD of Detected	0.00402			SD of Detected			0.869
3782					Minimum Non-Detect	0.02			Minimum Non-Detect			-3.912
3783					Maximum Non-Detect	0.4			Maximum Non-Detect			-0.916
3784												
3785	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			17
3786	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			0
3787	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
3788												
3789	**UCL Statistics**											
3790	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3791					Shapiro Wilk Test Statistic	0.756			Shapiro Wilk Test Statistic			0.926
3792					5% Shapiro Wilk Critical Value	0.842			5% Shapiro Wilk Critical Value			0.842
3793	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3794												
3795	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3796					DL/2 Substitution Method				DL/2 Substitution Method			
3797					Mean	0.0185			Mean			-5.104
3798					SD	0.047			SD			1.318
3799					95% DL/2 (t) UCL	0.0384			95% H-Stat (DL/2) UCL			0.0887
3800												
3801					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
3802	**MLE method failed to converge properly**								Mean in Log Scale			-5.869
3803									SD in Log Scale			0.724
3804									Mean in Original Scale			0.00369
3805									SD in Original Scale			0.00322
3806									95% Percentile Bootstrap UCL			0.00502
3807									95% BCA Bootstrap UCL			0.00554
3808												
3809	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3810					k star (bias corrected)	1.133	**Data appear Gamma Distributed at 5% Significance Level**					
3811					Theta Star	0.00359						
3812					nu star	22.65						
3813												
3814					A-D Test Statistic	0.57	**Nonparametric Statistics**					
3815					5% A-D Critical Value	0.739			Kaplan-Meier (KM) Method			
3816					K-S Test Statistic	0.739			Mean			0.00406

3817				5% K-S Critical Value	0.271					SD	0.00381
3818	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00127
3819										95% KM (t) UCL	0.00628
3820	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00615
3821	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL	0.00633
3822				Minimum	0.000412					95% KM (bootstrap t) UCL	0.00826
3823				Maximum	0.014					95% KM (BCA) UCL	0.00629
3824				Mean	0.00408					95% KM (Percentile Bootstrap) UCL	0.0062
3825				Median	0.00414					95% KM (Chebyshev) UCL	0.0096
3826				SD	0.00331					97.5% KM (Chebyshev) UCL	0.012
3827				k star	1.467					99% KM (Chebyshev) UCL	0.0167
3828				Theta star	0.00278						
3829				Nu star	49.86					**Potential UCLs to Use**	
3830				AppChi2	34.65					95% KM (t) UCL	0.00628
3831				95% Gamma Approximate UCL	0.00587						
3832				95% Adjusted Gamma UCL	0.0061						
3833	**Note: DL/2 is not a recommended method.**										
3834											
3835											
3836	**Nickel, dissolved (pge-7)**										
3837											
3838	**General Statistics**										
3839				Number of Valid Data	15					Number of Detected Data	9
3840				Number of Distinct Detected Data	7					Number of Non-Detect Data	6
3841										Percent Non-Detects	40.00%
3842											
3843	**Raw Statistics**									**Log-transformed Statistics**	
3844				Minimum Detected	0.0015					Minimum Detected	-6.502
3845				Maximum Detected	0.015					Maximum Detected	-4.2
3846				Mean of Detected	0.0048					Mean of Detected	-5.726
3847				SD of Detected	0.00477					SD of Detected	0.901
3848				Minimum Non-Detect	0.02					Minimum Non-Detect	-3.912
3849				Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916
3850											
3851	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	15
3852	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0
3853	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%
3854											
3855	**Warning: There are only 9 Detected Values in this data**										
3856	**Note: It should be noted that even though bootstrap may be performed on this data set**										
3857	**the resulting calculations may not be reliable enough tp draw conclusions**										
3858											
3859	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**										
3860											
3861											
3862	**UCL Statistics**										
3863	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**	
3864				Shapiro Wilk Test Statistic	0.756					Shapiro Wilk Test Statistic	0.826
3865				5% Shapiro Wilk Critical Value	0.829					5% Shapiro Wilk Critical Value	0.829
3866	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**	
3867											
3868	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**	
3869				DL/2 Substitution Method						DL/2 Substitution Method	

3870					Mean	0.0202					Mean	-5.018
3871					SD	0.05					SD	1.32
3872					95% DL/2 (t) UCL	0.0429					95% H-Stat (DL/2) UCL	0.15
3873												
3874					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3875					**MLE method failed to converge properly**						Mean in Log Scale	-5.726
3876											SD in Log Scale	0.76
3877											Mean in Original Scale	0.00437
3878											SD in Original Scale	0.00387
3879											95% Percentile Bootstrap UCL	0.00608
3880											95% BCA Bootstrap UCL	0.0065
3881												
3882					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
3883					k star (bias corrected)	1.032					**Data do not follow a Discernable Distribution (0.05)**	
3884					Theta Star	0.00465						
3885					nu star	18.58						
3886												
3887					A-D Test Statistic	0.805					**Nonparametric Statistics**	
3888					5% A-D Critical Value	0.736					Kaplan-Meier (KM) Method	
3889					K-S Test Statistic	0.736					Mean	0.0048
3890					5% K-S Critical Value	0.284					SD	0.0045
3891					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00159
3892											95% KM (t) UCL	0.0076
3893					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00741
3894					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00767
3895					Minimum	0.000305					95% KM (bootstrap t) UCL	0.0121
3896					Maximum	0.015					95% KM (BCA) UCL	0.00787
3897					Mean	0.0048					95% KM (Percentile Bootstrap) UCL	0.00773
3898					Median	0.0048					95% KM (Chebyshev) UCL	0.0117
3899					SD	0.00403					97.5% KM (Chebyshev) UCL	0.0147
3900					k star	1.217					99% KM (Chebyshev) UCL	0.0206
3901					Theta star	0.00394						
3902					Nu star	36.5					**Potential UCLs to Use**	
3903					AppChi2	23.67					95% KM (t) UCL	0.0076
3904					95% Gamma Approximate UCL	0.0074					95% KM (% Bootstrap) UCL	0.00773
3905					95% Adjusted Gamma UCL	0.00782						
3906	**Note: DL/2 is not a recommended method.**											
3907												
3908												
3909	**Nickel, dissolved (pge-8)**											
3910												
3911							**General Statistics**					
3912					Number of Valid Data	17					Number of Detected Data	9
3913					Number of Distinct Detected Data	9					Number of Non-Detect Data	8
3914											Percent Non-Detects	47.06%
3915												
3916					**Raw Statistics**						**Log-transformed Statistics**	
3917					Minimum Detected	0.0012					Minimum Detected	-6.725
3918					Maximum Detected	0.045					Maximum Detected	-3.101
3919					Mean of Detected	0.0101					Mean of Detected	-5.259
3920					SD of Detected	0.0141					SD of Detected	1.178
3921					Minimum Non-Detect	0.02					Minimum Non-Detect	-3.912
3922					Maximum Non-Detect	0.4					Maximum Non-Detect	-0.916

3923												
3924	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	17
3925	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
3926	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
3927												
3928	**Warning: There are only 9 Detected Values in this data**											
3929	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3930	**the resulting calculations may not be reliable enough tp draw conclusions**											
3931												
3932	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3933												
3934												
3935	**UCL Statistics**											
3936	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3937	Shapiro Wilk Test Statistic				0.674		Shapiro Wilk Test Statistic					0.941
3938	5% Shapiro Wilk Critical Value				0.829		5% Shapiro Wilk Critical Value					0.829
3939	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3940												
3941	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3942	DL/2 Substitution Method						DL/2 Substitution Method					
3943	Mean				0.0221		Mean					-4.696
3944	SD				0.0469		SD					1.227
3945	95% DL/2 (t) UCL				0.042		95% H-Stat (DL/2) UCL					0.126
3946												
3947	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
3948	**MLE method failed to converge properly**						Mean in Log Scale					-5.373
3949							SD in Log Scale					0.972
3950							Mean in Original Scale					0.00777
3951							SD in Original Scale					0.0106
3952							95% Percentile Bootstrap UCL					0.0124
3953							95% BCA Bootstrap UCL					0.0141
3954												
3955	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3956	k star (bias corrected)				0.66		**Data appear Gamma Distributed at 5% Significance Level**					
3957	Theta Star				0.0154							
3958	nu star				11.87							
3959												
3960	A-D Test Statistic				0.554		**Nonparametric Statistics**					
3961	5% A-D Critical Value				0.747		Kaplan-Meier (KM) Method					
3962	K-S Test Statistic				0.747		Mean					0.00824
3963	5% K-S Critical Value				0.288		SD					0.0107
3964	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00311
3965							95% KM (t) UCL					0.0137
3966	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0134
3967	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0137
3968	Minimum				0.0012		95% KM (bootstrap t) UCL					0.021
3969	Maximum				0.045		95% KM (BCA) UCL					0.0133
3970	Mean				0.0101		95% KM (Percentile Bootstrap) UCL					0.0134
3971	Median				0.00848		95% KM (Chebyshev) UCL					0.0218
3972	SD				0.0102		97.5% KM (Chebyshev) UCL					0.0277
3973	k star				1.233		99% KM (Chebyshev) UCL					0.0392
3974	Theta star				0.00821							
3975	Nu star				41.93		**Potential UCLs to Use**					

3976					AppChi2	28.09					95% KM (BCA) UCL	0.0133
3977					95% Gamma Approximate UCL	0.0151						
3978					95% Adjusted Gamma UCL	0.0158						
3979	**Note: DL/2 is not a recommended method.**											
3980												
3981												
3982	**Nickel, dissolved (tw-1)**											
3983												
3984	**General Statistics**											
3985					Number of Valid Data	4					Number of Detected Data	0
3986					Number of Distinct Detected Data	0					Number of Non-Detect Data	4
3987											Percent Non-Detects	100.00%
3988												
3989	**Warning: This data set only has 4 observations!**											
3990	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3991	**The data set for variable Nickel, dissolved (tw-1) was not processed!**											
3992												
3993	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3994	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3995												
3996												
3997												
3998	**Nickel, dissolved (tw-2d)**											
3999												
4000	**General Statistics**											
4001					Number of Valid Data	3					Number of Detected Data	1
4002					Number of Distinct Detected Data	1					Number of Non-Detect Data	2
4003											Percent Non-Detects	66.67%
4004												
4005	**Warning: This data set only has 3 observations!**											
4006	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4007	**The data set for variable Nickel, dissolved (tw-2d) was not processed!**											
4008												
4009	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4010	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4011												
4012												
4013												
4014	**Nickel, dissolved (tw-2s)**											
4015												
4016	**General Statistics**											
4017					Number of Valid Data	3					Number of Detected Data	0
4018					Number of Distinct Detected Data	0					Number of Non-Detect Data	3
4019											Percent Non-Detects	100.00%
4020												
4021	**Warning: This data set only has 3 observations!**											
4022	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4023	**The data set for variable Nickel, dissolved (tw-2s) was not processed!**											
4024												
4025	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4026	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4027												
4028												

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_dat								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Nitrate as Nitrogen (1)											
10												
11	General Statistics											
12	Number of Valid Data			148		Number of Detected Data			118			
13	Number of Distinct Detected Data			92		Number of Non-Detect Data			30			
14						Percent Non-Detects			20.27%			
15												
16	Raw Statistics					Log-transformed Statistics						
17	Minimum Detected			0.687		Minimum Detected			-0.375			
18	Maximum Detected			4.75		Maximum Detected			1.558			
19	Mean of Detected			2.587		Mean of Detected			0.871			
20	SD of Detected			0.984		SD of Detected			0.416			
21	Minimum Non-Detect			0.1		Minimum Non-Detect			-2.303			
22	Maximum Non-Detect			0.5		Maximum Non-Detect			-0.693			
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect			30			
25	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected			118			
26	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage			20.27%			
27												
28	UCL Statistics											
29	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
30	Lilliefors Test Statistic			0.162		Lilliefors Test Statistic			0.103			
31	5% Lilliefors Critical Value			0.0816		5% Lilliefors Critical Value			0.0816			
32	Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level						
33												
34	Assuming Normal Distribution					Assuming Lognormal Distribution						
35	DL/2 Substitution Method					DL/2 Substitution Method						
36	Mean			2.11		Mean			0.392			
37	SD			1.292		SD			1.04			
38	95% DL/2 (t) UCL			2.286		95% H-Stat (DL/2) UCL			2.336			
39												
40	Maximum Likelihood Estimate(MLE) Method					Log ROS Method						
41	Mean			2.008		Mean in Log Scale			0.689			
42	SD			1.472		SD in Log Scale			0.527			
43	95% MLE (t) UCL			2.209		Mean in Original Scale			2.264			
44	95% MLE (Tiku) UCL			2.219		SD in Original Scale			1.091			
45						95% Percentile Bootstrap UCL			2.41			
46						95% BCA Bootstrap UCL			2.412			
47												
48	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
49	k star (bias corrected)			6.328		Data do not follow a Discernable Distribution (0.05)						
50	Theta Star			0.409								
51	nu star			1494								
52												
53	A-D Test Statistic			1.637		Nonparametric Statistics						

54				5% A-D Critical Value	0.754					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.754					Mean		2.201
56				5% K-S Critical Value	0.0849					SD		1.161
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.0958
58										95% KM (t) UCL		2.36
59				**Assuming Gamma Distribution**						95% KM (z) UCL		2.359
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		2.36
61				Minimum	1E-09					95% KM (bootstrap t) UCL		2.355
62				Maximum	4.75					95% KM (BCA) UCL		2.367
63				Mean	2.333					95% KM (Percentile Bootstrap) UCL		2.368
64				Median	1.955					95% KM (Chebyshev) UCL		2.619
65				SD	1.044					97.5% KM (Chebyshev) UCL		2.8
66				k star	2.088					99% KM (Chebyshev) UCL		3.155
67				Theta star	1.118							
68				Nu star	618					**Potential UCLs to Use**		
69				AppChi2	561.3					95% KM (BCA) UCL		2.367
70				95% Gamma Approximate UCL	2.569							
71				95% Adjusted Gamma UCL	2.571							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Nitrate as Nitrogen (cw-1d)**											
76												
77					**General Statistics**							
78				Number of Valid Observations	8					Number of Distinct Observations		8
79												
80				**Raw Statistics**						**Log-transformed Statistics**		
81				Minimum	0.566					Minimum of Log Data		-0.569
82				Maximum	3.78					Maximum of Log Data		1.33
83				Mean	1.916					Mean of log Data		0.42
84				Median	1.705					SD of log Data		0.761
85				SD	1.263							
86				Coefficient of Variation	0.659							
87				Skewness	0.368							
88												
89												
90					**Warning: There are only 8 Values in this data**							
91					**Note: It should be noted that even though bootstrap methods may be performed on this data set,**							
92					**the resulting calculations may not be reliable enough to draw conclusions**							
93												
94					**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**							
95												
96					**Relevant UCL Statistics**							
97				**Normal Distribution Test**						**Lognormal Distribution Test**		
98				Shapiro Wilk Test Statistic	0.901					Shapiro Wilk Test Statistic		0.902
99				Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value		0.818
100				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
101												
102				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
103				95% Student's-t UCL	2.762					95% H-UCL		4.64
104				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL		4.275
105				95% Adjusted-CLT UCL	2.713					97.5% Chebyshev (MVUE) UCL		5.282
106				95% Modified-t UCL	2.772					99% Chebyshev (MVUE) UCL		7.259

107												
108	**Gamma Distribution Test**						**Data Distribution**					
109	k star (bias corrected)				1.537		**Data appear Normal at 5% Significance Level**					
110	Theta Star				1.247							
111	nu star				24.59							
112	Approximate Chi Square Value (.05)				14.29		**Nonparametric Statistics**					
113	Adjusted Level of Significance				0.0195		95% CLT UCL					2.651
114	Adjusted Chi Square Value				12.36		95% Jackknife UCL					2.762
115							95% Standard Bootstrap UCL					2.609
116	Anderson-Darling Test Statistic				0.364		95% Bootstrap-t UCL					2.882
117	Anderson-Darling 5% Critical Value				0.723		95% Hall's Bootstrap UCL					2.591
118	Kolmogorov-Smirnov Test Statistic				0.165		95% Percentile Bootstrap UCL					2.619
119	Kolmogorov-Smirnov 5% Critical Value				0.297		95% BCA Bootstrap UCL					2.642
120	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					3.863
121							97.5% Chebyshev(Mean, Sd) UCL					4.705
122	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					6.36
123	95% Approximate Gamma UCL				3.295							
124	95% Adjusted Gamma UCL				3.813							
125												
126	**Potential UCL to Use**						Use 95% Student's-t UCL					2.762
127												
128												
129	**Nitrate as Nitrogen (cw-1m)**											
130												
131	**General Statistics**											
132	Number of Valid Observations				8		Number of Distinct Observations					8
133												
134	**Raw Statistics**						**Log-transformed Statistics**					
135	Minimum				0.832		Minimum of Log Data					-0.184
136	Maximum				2.31		Maximum of Log Data					0.837
137	Mean				1.455		Mean of log Data					0.326
138	Median				1.495		SD of log Data					0.335
139	SD				0.48							
140	Coefficient of Variation				0.33							
141	Skewness				0.52							
142												
143												
144	**Warning: There are only 8 Values in this data**											
145	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
146	**the resulting calculations may not be reliable enough to draw conclusions**											
147												
148	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
149												
150	**Relevant UCL Statistics**											
151	**Normal Distribution Test**						**Lognormal Distribution Test**					
152	Shapiro Wilk Test Statistic				0.961		Shapiro Wilk Test Statistic					0.973
153	Shapiro Wilk Critical Value				0.818		Shapiro Wilk Critical Value					0.818
154	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
155												
156	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
157	95% Student's-t UCL				1.776		95% H-UCL					1.914
158	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					2.211
159	95% Adjusted-CLT UCL				1.767		97.5% Chebyshev (MVUE) UCL					2.539

160				95% Modified-t UCL	1.781					99% Chebyshev (MVUE) UCL	3.181	
161												
162				**Gamma Distribution Test**						**Data Distribution**		
163				k star (bias corrected)	6.645					**Data appear Normal at 5% Significance Level**		
164				Theta Star	0.219							
165				nu star	106.3							
166				Approximate Chi Square Value (.05)	83.53					**Nonparametric Statistics**		
167				Adjusted Level of Significance	0.0195					95% CLT UCL	1.734	
168				Adjusted Chi Square Value	78.43					95% Jackknife UCL	1.776	
169										95% Standard Bootstrap UCL	1.722	
170				Anderson-Darling Test Statistic	0.205					95% Bootstrap-t UCL	1.835	
171				Anderson-Darling 5% Critical Value	0.715					95% Hall's Bootstrap UCL	1.856	
172				Kolmogorov-Smirnov Test Statistic	0.153					95% Percentile Bootstrap UCL	1.732	
173				Kolmogorov-Smirnov 5% Critical Value	0.294					95% BCA Bootstrap UCL	1.734	
174				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	2.194	
175										97.5% Chebyshev(Mean, Sd) UCL	2.514	
176				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	3.143	
177				95% Approximate Gamma UCL	1.852							
178				95% Adjusted Gamma UCL	1.972							
179												
180				**Potential UCL to Use**						Use 95% Student's-t UCL	1.776	
181												
182												
183	**Nitrate as Nitrogen (cw-2d)**											
184												
185				**General Statistics**								
186				Number of Valid Data	8					Number of Detected Data	7	
187				Number of Distinct Detected Data	6					Number of Non-Detect Data	1	
188										Percent Non-Detects	12.50%	
189												
190				**Raw Statistics**						**Log-transformed Statistics**		
191				Minimum Detected	0.28					Minimum Detected	-1.273	
192				Maximum Detected	2.69					Maximum Detected	0.99	
193				Mean of Detected	1.032					Mean of Detected	-0.381	
194				SD of Detected	0.975					SD of Detected	0.984	
195				Minimum Non-Detect	0.5					Minimum Non-Detect	-0.693	
196				Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693	
197												
198												
199				**Warning: There are only 7 Detected Values in this data**								
200				**Note: It should be noted that even though bootstrap may be performed on this data set**								
201				**the resulting calculations may not be reliable enough tp draw conclusions**								
202												
203				**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**								
204												
205												
206				**UCL Statistics**								
207				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
208				Shapiro Wilk Test Statistic	0.806					Shapiro Wilk Test Statistic	0.824	
209				5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803	
210				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
211												
212				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		

213				DL/2 Substitution Method							DL/2 Substitution Method	
214				Mean	0.934						Mean	-0.507
215				SD	0.944						SD	0.978
216				95% DL/2 (t) UCL	1.567						95% H-Stat (DL/2) UCL	4.065
217												
218				Maximum Likelihood Estimate(MLE) Method							Log ROS Method	
219				Mean	0.0594						Mean in Log Scale	-0.458
220				SD	1.78						SD in Log Scale	0.937
221				95% MLE (t) UCL	1.252						Mean in Original Scale	0.949
222				95% MLE (Tiku) UCL	1.796						SD in Original Scale	0.933
223											95% Percentile Bootstrap UCL	1.519
224											95% BCA Bootstrap UCL	1.574
225												
226				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
227				k star (bias corrected)	0.869						**Data appear Normal at 5% Significance Level**	
228				Theta Star	1.187							
229				nu star	12.17							
230												
231				A-D Test Statistic	0.674						**Nonparametric Statistics**	
232				5% A-D Critical Value	0.723						Kaplan-Meier (KM) Method	
233				K-S Test Statistic	0.723						Mean	0.943
234				5% K-S Critical Value	0.318						SD	0.877
235				**Data follow Appr. Gamma Distribution at 5% Significance Level**							SE of Mean	0.335
236											95% KM (t) UCL	1.578
237				**Assuming Gamma Distribution**							95% KM (z) UCL	1.494
238				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	1.571
239				Minimum	0.28						95% KM (bootstrap t) UCL	2.24
240				Maximum	2.69						95% KM (BCA) UCL	1.449
241				Mean	0.975						95% KM (Percentile Bootstrap) UCL	1.527
242				Median	0.482						95% KM (Chebyshev) UCL	2.403
243				SD	0.917						97.5% KM (Chebyshev) UCL	3.035
244				k star	1.003						99% KM (Chebyshev) UCL	4.276
245				Theta star	0.972							
246				Nu star	16.05						**Potential UCLs to Use**	
247				AppChi2	7.999						95% KM (t) UCL	1.578
248				95% Gamma Approximate UCL	1.957						95% KM (Percentile Bootstrap) UCL	1.527
249				95% Adjusted Gamma UCL	2.367							
250	**Note: DL/2 is not a recommended method.**											
251												
252												
253	**Nitrate as Nitrogen (cw-2m)**											
254												
255					**General Statistics**							
256				Number of Valid Observations	8						Number of Distinct Observations	8
257												
258				**Raw Statistics**							**Log-transformed Statistics**	
259				Minimum	0.703						Minimum of Log Data	-0.352
260				Maximum	1.09						Maximum of Log Data	0.0862
261				Mean	0.951						Mean of log Data	-0.0592
262				Median	0.98						SD of log Data	0.148
263				SD	0.131							
264				Coefficient of Variation	0.138							
265				Skewness	-1.042							

266												
267												
268						**Warning: There are only 8 Values in this data**							
269						**Note: It should be noted that even though bootstrap methods may be performed on this data set,**							
270						**the resulting calculations may not be reliable enough to draw conclusions**							
271													
272						**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**							
273													
274						**Relevant UCL Statistics**							
275				**Normal Distribution Test**						**Lognormal Distribution Test**			
276				Shapiro Wilk Test Statistic	0.903					Shapiro Wilk Test Statistic	0.874		
277				Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818		
278				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**			
279													
280				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**			
281				95% Student's-t UCL	1.039					95% H-UCL	1.059		
282				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	1.169		
283				95% Adjusted-CLT UCL	1.009					97.5% Chebyshev (MVUE) UCL	1.263		
284				95% Modified-t UCL	1.036					99% Chebyshev (MVUE) UCL	1.447		
285													
286				**Gamma Distribution Test**						**Data Distribution**			
287				k star (bias corrected)	34.41					**Data appear Normal at 5% Significance Level**			
288				Theta Star	0.0276								
289				nu star	550.5								
290				Approximate Chi Square Value (.05)	497.1					**Nonparametric Statistics**			
291				Adjusted Level of Significance	0.0195					95% CLT UCL	1.027		
292				Adjusted Chi Square Value	484.2					95% Jackknife UCL	1.039		
293										95% Standard Bootstrap UCL	1.024		
294				Anderson-Darling Test Statistic	0.466					95% Bootstrap-t UCL	1.019		
295				Anderson-Darling 5% Critical Value	0.715					95% Hall's Bootstrap UCL	1.012		
296				Kolmogorov-Smirnov Test Statistic	0.249					95% Percentile Bootstrap UCL	1.022		
297				Kolmogorov-Smirnov 5% Critical Value	0.293					95% BCA Bootstrap UCL	1.009		
298				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	1.153		
299										97.5% Chebyshev(Mean, Sd) UCL	1.241		
300				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	1.412		
301				95% Approximate Gamma UCL	1.053								
302				95% Adjusted Gamma UCL	1.081								
303													
304				**Potential UCL to Use**						Use 95% Student's-t UCL	1.039		
305													
306													
307	**Nitrate as Nitrogen (cw-3d)**												
308													
309						**General Statistics**							
310				Number of Valid Data	8					Number of Detected Data	7		
311				Number of Distinct Detected Data	7					Number of Non-Detect Data	1		
312										Percent Non-Detects	12.50%		
313													
314				**Raw Statistics**						**Log-transformed Statistics**			
315				Minimum Detected	0.251					Minimum Detected	-1.382		
316				Maximum Detected	2.62					Maximum Detected	0.963		
317				Mean of Detected	0.77					Mean of Detected	-0.673		
318				SD of Detected	0.883					SD of Detected	0.888		

319				Minimum Non-Detect	0.5					Minimum Non-Detect	-0.693	
320				Maximum Non-Detect	0.5					Maximum Non-Detect	-0.693	
321												
322												
323	**Warning: There are only 7 Detected Values in this data**											
324	**Note: It should be noted that even though bootstrap may be performed on this data set**											
325	**the resulting calculations may not be reliable enough tp draw conclusions**											
326												
327	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
328												
329												
330	**UCL Statistics**											
331	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
332				Shapiro Wilk Test Statistic	0.657					Shapiro Wilk Test Statistic	0.751	
333				5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803	
334	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
335												
336	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
337				DL/2 Substitution Method						DL/2 Substitution Method		
338				Mean	0.705					Mean	-0.762	
339				SD	0.837					SD	0.86	
340				95% DL/2 (t) UCL	1.266					95% H-Stat (DL/2) UCL	2.301	
341												
342				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
343	**MLE method failed to converge properly**									Mean in Log Scale	-0.717	
344										SD in Log Scale	0.832	
345										Mean in Original Scale	0.718	
346										SD in Original Scale	0.83	
347										95% Percentile Bootstrap UCL	1.186	
348										95% BCA Bootstrap UCL	1.456	
349												
350	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
351				k star (bias corrected)	0.872		**Data do not follow a Discernable Distribution (0.05)**					
352				Theta Star	0.882							
353				nu star	12.21							
354												
355				A-D Test Statistic	1.077		**Nonparametric Statistics**					
356				5% A-D Critical Value	0.723					Kaplan-Meier (KM) Method		
357				K-S Test Statistic	0.723					Mean	0.712	
358				5% K-S Critical Value	0.318					SD	0.779	
359	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.298	
360										95% KM (t) UCL	1.276	
361	**Assuming Gamma Distribution**									95% KM (z) UCL	1.202	
362				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.27	
363				Minimum	0.251					95% KM (bootstrap t) UCL	10.29	
364				Maximum	2.62					95% KM (BCA) UCL	1.234	
365				Mean	0.745					95% KM (Percentile Bootstrap) UCL	1.187	
366				Median	0.337					95% KM (Chebyshev) UCL	2.01	
367				SD	0.82					97.5% KM (Chebyshev) UCL	2.571	
368				k star	1.033					99% KM (Chebyshev) UCL	3.674	
369				Theta star	0.721							
370				Nu star	16.52		**Potential UCLs to Use**					
371				AppChi2	8.331					95% KM (Chebyshev) UCL	2.01	

95% Gamma Approximate UCL	1.477	
95% Adjusted Gamma UCL	1.78	

Note: DL/2 is not a recommended method.

Nitrate as Nitrogen (cw-3m)

General Statistics

Number of Valid Observations	8	Number of Distinct Observations	8

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.594	Minimum of Log Data	-0.521
Maximum	5.98	Maximum of Log Data	1.788
Mean	1.387	Mean of log Data	-0.06
Median	0.789	SD of log Data	0.761
SD	1.859		
Coefficient of Variation	1.34		
Skewness	2.81		

Warning: There are only 8 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.472	Shapiro Wilk Test Statistic	0.599
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.632	95% H-UCL	2.872
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.645
95% Adjusted-CLT UCL	3.166	97.5% Chebyshev (MVUE) UCL	3.269
95% Modified-t UCL	2.741	99% Chebyshev (MVUE) UCL	4.492
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.98	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	1.415		
nu star	15.68		
Approximate Chi Square Value (.05)	7.739	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	2.468
Adjusted Chi Square Value	6.38	95% Jackknife UCL	2.632
		95% Standard Bootstrap UCL	2.385
Anderson-Darling Test Statistic	1.834	95% Bootstrap-t UCL	14.86
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	12.42
Kolmogorov-Smirnov Test Statistic	0.465	95% Percentile Bootstrap UCL	2.696
Kolmogorov-Smirnov 5% Critical Value	0.299	95% BCA Bootstrap UCL	2.764
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.252
		97.5% Chebyshev(Mean, Sd) UCL	5.491
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.926

425				95% Approximate Gamma UCL	2.811							
426				95% Adjusted Gamma UCL	3.41							
427												
428	**Potential UCL to Use**									Use 95% Chebyshev (Mean, Sd) UCL	4.252	
429												
430												
431	**Nitrate as Nitrogen (cw-4d)**											
432												
433	**General Statistics**											
434				Number of Valid Data	8				Number of Detected Data	7		
435				Number of Distinct Detected Data	7				Number of Non-Detect Data	1		
436									Percent Non-Detects	12.50%		
437												
438	**Raw Statistics**							**Log-transformed Statistics**				
439				Minimum Detected	0.188				Minimum Detected	-1.671		
440				Maximum Detected	1.28				Maximum Detected	0.247		
441				Mean of Detected	0.586				Mean of Detected	-0.798		
442				SD of Detected	0.471				SD of Detected	0.77		
443				Minimum Non-Detect	0.5				Minimum Non-Detect	-0.693		
444				Maximum Non-Detect	0.5				Maximum Non-Detect	-0.693		
445												
446												
447	**Warning: There are only 7 Detected Values in this data**											
448	**Note: It should be noted that even though bootstrap may be performed on this data set**											
449	**the resulting calculations may not be reliable enough tp draw conclusions**											
450												
451	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
452												
453												
454	**UCL Statistics**											
455	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
456				Shapiro Wilk Test Statistic	0.77				Shapiro Wilk Test Statistic	0.884		
457				5% Shapiro Wilk Critical Value	0.803				5% Shapiro Wilk Critical Value	0.803		
458	**Data not Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
459												
460	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
461				DL/2 Substitution Method					DL/2 Substitution Method			
462				Mean	0.544				Mean	-0.872		
463				SD	0.452				SD	0.742		
464				95% DL/2 (t) UCL	0.847				95% H-Stat (DL/2) UCL	1.667		
465												
466				Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method			
467	**MLE method failed to converge properly**								Mean in Log Scale	-0.839		
468									SD in Log Scale	0.722		
469									Mean in Original Scale	0.553		
470									SD in Original Scale	0.446		
471									95% Percentile Bootstrap UCL	0.803		
472									95% BCA Bootstrap UCL	0.9		
473												
474	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
475				k star (bias corrected)	1.266			**Data appear Gamma Distributed at 5% Significance Level**				
476				Theta Star	0.463							
477				nu star	17.72							

478												
479					A-D Test Statistic	0.567	**Nonparametric Statistics**					
480					5% A-D Critical Value	0.715					Kaplan-Meier (KM) Method	
481					K-S Test Statistic	0.715					Mean	0.552
482					5% K-S Critical Value	0.315					SD	0.419
483					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.161
484											95% KM (t) UCL	0.857
485					**Assuming Gamma Distribution**						95% KM (z) UCL	0.817
486					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.855
487					Minimum	0.188					95% KM (bootstrap t) UCL	1.441
488					Maximum	1.28					95% KM (BCA) UCL	0.804
489					Mean	0.577					95% KM (Percentile Bootstrap) UCL	0.809
490					Median	0.443					95% KM (Chebyshev) UCL	1.254
491					SD	0.437					97.5% KM (Chebyshev) UCL	1.557
492					k star	1.529					99% KM (Chebyshev) UCL	2.153
493					Theta star	0.377						
494					Nu star	24.46	**Potential UCLs to Use**					
495					AppChi2	14.2					95% KM (BCA) UCL	0.804
496					95% Gamma Approximate UCL	0.994						
497					95% Adjusted Gamma UCL	1.151						
498	**Note: DL/2 is not a recommended method.**											
499												
500												
501	**Nitrate as Nitrogen (cw-4m)**											
502												
503					**General Statistics**							
504					Number of Valid Data	8					Number of Detected Data	7
505					Number of Distinct Detected Data	7					Number of Non-Detect Data	1
506											Percent Non-Detects	12.50%
507												
508					**Raw Statistics**						**Log-transformed Statistics**	
509					Minimum Detected	1.18					Minimum Detected	0.166
510					Maximum Detected	1.96					Maximum Detected	0.673
511					Mean of Detected	1.589					Mean of Detected	0.451
512					SD of Detected	0.253					SD of Detected	0.165
513					Minimum Non-Detect	0.1					Minimum Non-Detect	-2.303
514					Maximum Non-Detect	0.1					Maximum Non-Detect	-2.303
515												
516												
517	**Warning: There are only 7 Detected Values in this data**											
518	**Note: It should be noted that even though bootstrap may be performed on this data set**											
519	**the resulting calculations may not be reliable enough tp draw conclusions**											
520												
521	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
522												
523												
524	**UCL Statistics**											
525	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
526					Shapiro Wilk Test Statistic	0.979					Shapiro Wilk Test Statistic	0.964
527					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
528	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
529												
530	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					

531				DL/2 Substitution Method						DL/2 Substitution Method		
532				Mean	1.396					Mean		0.0206
533				SD	0.592					SD		1.228
534				95% DL/2 (t) UCL	1.793					95% H-Stat (DL/2) UCL		5.901
535												
536				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
537				Mean	1.589					Mean in Log Scale		0.401
538				SD	0.234					SD in Log Scale		0.209
539				95% MLE (t) UCL	1.746					Mean in Original Scale		1.521
540				95% MLE (Tiku) UCL	1.756					SD in Original Scale		0.302
541										95% Percentile Bootstrap UCL		1.683
542										95% BCA Bootstrap UCL		1.679
543												
544				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
545				k star (bias corrected)	25.39					**Data appear Normal at 5% Significance Level**		
546				Theta Star	0.0626							
547				nu star	355.5							
548												
549				A-D Test Statistic	0.217					**Nonparametric Statistics**		
550				5% A-D Critical Value	0.707					Kaplan-Meier (KM) Method		
551				K-S Test Statistic	0.707					Mean		1.538
552				5% K-S Critical Value	0.311					SD		0.258
553				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		0.0984
554										95% KM (t) UCL		1.724
555				**Assuming Gamma Distribution**						95% KM (z) UCL		1.699
556				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1.729
557				Minimum	1.129					95% KM (bootstrap t) UCL		1.717
558				Maximum	1.96					95% KM (BCA) UCL		1.736
559				Mean	1.531					95% KM (Percentile Bootstrap) UCL		1.703
560				Median	1.515					95% KM (Chebyshev) UCL		1.966
561				SD	0.285					97.5% KM (Chebyshev) UCL		2.152
562				k star	20.02					99% KM (Chebyshev) UCL		2.516
563				Theta star	0.0765							
564				Nu star	320.2					**Potential UCLs to Use**		
565				AppChi2	279.8					95% KM (t) UCL		1.724
566				95% Gamma Approximate UCL	1.753					95% KM (Percentile Bootstrap) UCL		1.703
567				95% Adjusted Gamma UCL	1.815							
568	**Note: DL/2 is not a recommended method.**											
569												
570												
571	**Nitrate as Nitrogen (mw-1)**											
572												
573						**General Statistics**							
574				Number of Valid Observations	2					Number of Distinct Observations		2
575												
576												
577						**Warning: This data set only has 2 observations!**							
578						**Data set is too small to compute reliable and meaningful statistics and estimates!**							
579						**The data set for variable Nitrate as Nitrogen (mw-1) was not processed!**							
580												
581						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
582						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
583												

584												
585												
586	**Nitrate as Nitrogen (mw-10)**											
587												
588						**General Statistics**						
589					Number of Valid Observations	7			Number of Distinct Observations	7		
590												
591					**Raw Statistics**				**Log-transformed Statistics**			
592					Minimum	3.816			Minimum of Log Data	1.339		
593					Maximum	16.1			Maximum of Log Data	2.779		
594					Mean	9.647			Mean of log Data	2.086		
595					Median	10.6			SD of log Data	0.681		
596					SD	5.595						
597					Coefficient of Variation	0.58						
598					Skewness	-0.0701						
599												
600												
601					**Warning: A sample size of 'n' = 7 may not adequate enough to compute meaningful and reliable test statistics and estimates!**							
602												
603					**It is suggested to collect at least 8 to 10 observations using these statistical methods!**							
604					**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
605												
606												
607					**Warning: There are only 7 Values in this data**							
608					**Note: It should be noted that even though bootstrap methods may be performed on this data set,**							
609					**the resulting calculations may not be reliable enough to draw conclusions**							
610												
611					**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**							
612												
613						**Relevant UCL Statistics**						
614					**Normal Distribution Test**				**Lognormal Distribution Test**			
615					Shapiro Wilk Test Statistic	0.821			Shapiro Wilk Test Statistic	0.786		
616					Shapiro Wilk Critical Value	0.803			Shapiro Wilk Critical Value	0.803		
617					**Data appear Normal at 5% Significance Level**				**Data not Lognormal at 5% Significance Level**			
618												
619					**Assuming Normal Distribution**				**Assuming Lognormal Distribution**			
620					95% Student's-t UCL	13.76			95% H-UCL	22.5		
621					**95% UCLs (Adjusted for Skewness)**				95% Chebyshev (MVUE) UCL	20.83		
622					95% Adjusted-CLT UCL	13.07			97.5% Chebyshev (MVUE) UCL	25.61		
623					95% Modified-t UCL	13.75			99% Chebyshev (MVUE) UCL	35		
624												
625					**Gamma Distribution Test**				**Data Distribution**			
626					k star (bias corrected)	1.764			**Data appear Normal at 5% Significance Level**			
627					Theta Star	5.469						
628					nu star	24.7						
629					Approximate Chi Square Value (.05)	14.38			**Nonparametric Statistics**			
630					Adjusted Level of Significance	0.0158			95% CLT UCL	13.13		
631					Adjusted Chi Square Value	12.07			95% Jackknife UCL	13.76		
632									95% Standard Bootstrap UCL	12.89		
633					Anderson-Darling Test Statistic	0.746			95% Bootstrap-t UCL	14.06		
634					Anderson-Darling 5% Critical Value	0.712			95% Hall's Bootstrap UCL	12		
635					Kolmogorov-Smirnov Test Statistic	0.281			95% Percentile Bootstrap UCL	12.97		
636					Kolmogorov-Smirnov 5% Critical Value	0.314			95% BCA Bootstrap UCL	12.96		

637	Data follow Appr. Gamma Distribution at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		18.86
638										97.5% Chebyshev(Mean, Sd) UCL		22.85
639	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		30.69
640					95% Approximate Gamma UCL	16.57						
641					95% Adjusted Gamma UCL	19.74						
642												
643	Potential UCL to Use									Use 95% Student's-t UCL		13.76
644												
645												
646	Nitrate as Nitrogen (mw-11)											
647												
648	General Statistics											
649					Number of Valid Observations	8				Number of Distinct Observations		8
650												
651	Raw Statistics									Log-transformed Statistics		
652					Minimum	0.519				Minimum of Log Data		-0.655
653					Maximum	16.4				Maximum of Log Data		2.797
654					Mean	6.898				Mean of log Data		1.493
655					Median	8.37				SD of log Data		1.181
656					SD	5.289						
657					Coefficient of Variation	0.767						
658					Skewness	0.461						
659												
660												
661	Warning: There are only 8 Values in this data											
662	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
663	the resulting calculations may not be reliable enough to draw conclusions											
664												
665	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
666												
667	Relevant UCL Statistics											
668	Normal Distribution Test									Lognormal Distribution Test		
669					Shapiro Wilk Test Statistic	0.888				Shapiro Wilk Test Statistic		0.86
670					Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value		0.818
671	Data appear Normal at 5% Significance Level									Data appear Lognormal at 5% Significance Level		
672												
673	Assuming Normal Distribution									Assuming Lognormal Distribution		
674					95% Student's-t UCL	10.44				95% H-UCL		50.59
675	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL		22.56
676					95% Adjusted-CLT UCL	10.3				97.5% Chebyshev (MVUE) UCL		28.9
677					95% Modified-t UCL	10.49				99% Chebyshev (MVUE) UCL		41.36
678												
679	Gamma Distribution Test									Data Distribution		
680					k star (bias corrected)	0.885				Data appear Normal at 5% Significance Level		
681					Theta Star	7.791						
682					nu star	14.17						
683					Approximate Chi Square Value (.05)	6.685				Nonparametric Statistics		
684					Adjusted Level of Significance	0.0195				95% CLT UCL		9.974
685					Adjusted Chi Square Value	5.44				95% Jackknife UCL		10.44
686										95% Standard Bootstrap UCL		9.844
687					Anderson-Darling Test Statistic	0.59				95% Bootstrap-t UCL		10.82
688					Anderson-Darling 5% Critical Value	0.731				95% Hall's Bootstrap UCL		10.51
689					Kolmogorov-Smirnov Test Statistic	0.32				95% Percentile Bootstrap UCL		9.752

690				Kolmogorov-Smirnov 5% Critical Value	0.3					95% BCA Bootstrap UCL	10.01	
691				**Data follow Appr. Gamma Distribution at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	15.05	
692										97.5% Chebyshev(Mean, Sd) UCL	18.58	
693				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	25.5	
694				95% Approximate Gamma UCL	14.62							
695				95% Adjusted Gamma UCL	17.96							
696												
697				**Potential UCL to Use**						Use 95% Student's-t UCL	10.44	
698												
699												
700	**Nitrate as Nitrogen (mw-12)**											
701												
702				**General Statistics**								
703				Number of Valid Observations	7					Number of Distinct Observations	7	
704												
705				**Raw Statistics**						**Log-transformed Statistics**		
706				Minimum	0.519					Minimum of Log Data	-0.655	
707				Maximum	4.7					Maximum of Log Data	1.548	
708				Mean	3.204					Mean of log Data	0.962	
709				Median	4.13					SD of log Data	0.809	
710				SD	1.646							
711				Coefficient of Variation	0.514							
712				Skewness	-0.784							
713												
714												
715				**Warning: A sample size of 'n' = 7 may not adequate enough to compute meaningful and reliable test statistics and estimates!**								
716												
717				**It is suggested to collect at least 8 to 10 observations using these statistical methods!**								
718				**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**								
719												
720												
721				**Warning: There are only 7 Values in this data**								
722				**Note: It should be noted that even though bootstrap methods may be performed on this data set,**								
723				**the resulting calculations may not be reliable enough to draw conclusions**								
724												
725				**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**								
726												
727				**Relevant UCL Statistics**								
728				**Normal Distribution Test**						**Lognormal Distribution Test**		
729				Shapiro Wilk Test Statistic	0.861					Shapiro Wilk Test Statistic	0.783	
730				Shapiro Wilk Critical Value	0.803					Shapiro Wilk Critical Value	0.803	
731				**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
732												
733				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
734				95% Student's-t UCL	4.413					95% H-UCL	10.36	
735				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	8.032	
736				95% Adjusted-CLT UCL	4.03					97.5% Chebyshev (MVUE) UCL	10.02	
737				95% Modified-t UCL	4.382					99% Chebyshev (MVUE) UCL	13.93	
738												
739				**Gamma Distribution Test**						**Data Distribution**		
740				k star (bias corrected)	1.594					**Data appear Normal at 5% Significance Level**		
741				Theta Star	2.01							
742				nu star	22.31							

743					Approximate Chi Square Value (.05)	12.57		**Nonparametric Statistics**				
744					Adjusted Level of Significance	0.0158					95% CLT UCL	4.227
745					Adjusted Chi Square Value	10.43					95% Jackknife UCL	4.413
746											95% Standard Bootstrap UCL	4.163
747					Anderson-Darling Test Statistic	0.644					95% Bootstrap-t UCL	4.19
748					Anderson-Darling 5% Critical Value	0.713					95% Hall's Bootstrap UCL	3.937
749					Kolmogorov-Smirnov Test Statistic	0.308					95% Percentile Bootstrap UCL	4.111
750					Kolmogorov-Smirnov 5% Critical Value	0.314					95% BCA Bootstrap UCL	4.043
751					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	5.915
752											97.5% Chebyshev(Mean, Sd) UCL	7.089
753					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	9.393
754					95% Approximate Gamma UCL	5.686						
755					95% Adjusted Gamma UCL	6.85						
756												
757					**Potential UCL to Use**						Use 95% Student's-t UCL	4.413
758												
759												
760	**Nitrate as Nitrogen (mw-13)**											
761												
762					**General Statistics**							
763					Number of Valid Observations	7					Number of Distinct Observations	7
764												
765					**Raw Statistics**			**Log-transformed Statistics**				
766					Minimum	0.948					Minimum of Log Data	-0.053
767					Maximum	4.68					Maximum of Log Data	1.543
768					Mean	3.018					Mean of log Data	0.89
769					Median	4.2					SD of log Data	0.759
770					SD	1.809						
771					Coefficient of Variation	0.6						
772					Skewness	-0.354						
773												
774												
775					**Warning: A sample size of 'n' = 7 may not adequate enough to compute meaningful and reliable test statistics and estimates!**							
776												
777					**It is suggested to collect at least 8 to 10 observations using these statistical methods!**							
778					**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
779												
780												
781					**Warning: There are only 7 Values in this data**							
782					**Note: It should be noted that even though bootstrap methods may be performed on this data set,**							
783					**the resulting calculations may not be reliable enough to draw conclusions**							
784												
785					**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**							
786												
787					**Relevant UCL Statistics**							
788					**Normal Distribution Test**			**Lognormal Distribution Test**				
789					Shapiro Wilk Test Statistic	0.74					Shapiro Wilk Test Statistic	0.74
790					Shapiro Wilk Critical Value	0.803					Shapiro Wilk Critical Value	0.803
791					**Data not Normal at 5% Significance Level**			**Data not Lognormal at 5% Significance Level**				
792												
793					**Assuming Normal Distribution**			**Assuming Lognormal Distribution**				
794					95% Student's-t UCL	4.347					95% H-UCL	8.344
795					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	6.985

796				95% Adjusted-CLT UCL	4.045				97.5% Chebyshev (MVUE) UCL	8.669		
797				95% Modified-t UCL	4.331				99% Chebyshev (MVUE) UCL	11.98		
798												
799				**Gamma Distribution Test**					**Data Distribution**			
800				k star (bias corrected)	1.514				**Data do not follow a Discernable Distribution (0.05)**			
801				Theta Star	1.994							
802				nu star	21.19							
803				Approximate Chi Square Value (.05)	11.73				**Nonparametric Statistics**			
804				Adjusted Level of Significance	0.0158				95% CLT UCL	4.143		
805				Adjusted Chi Square Value	9.68				95% Jackknife UCL	4.347		
806									95% Standard Bootstrap UCL	4.035		
807				Anderson-Darling Test Statistic	1.016				95% Bootstrap-t UCL	4.13		
808				Anderson-Darling 5% Critical Value	0.714				95% Hall's Bootstrap UCL	3.736		
809				Kolmogorov-Smirnov Test Statistic	0.347				95% Percentile Bootstrap UCL	4.023		
810				Kolmogorov-Smirnov 5% Critical Value	0.314				95% BCA Bootstrap UCL	3.986		
811				**Data not Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	5.999		
812									97.5% Chebyshev(Mean, Sd) UCL	7.289		
813				**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	9.823		
814				95% Approximate Gamma UCL	5.45							
815				95% Adjusted Gamma UCL	6.606							
816												
817				**Potential UCL to Use**					Use 95% Chebyshev (Mean, Sd) UCL	5.999		
818				**Recommended UCL exceeds the maximum observation**								
819												
820												
821	**Nitrate as Nitrogen (mw-14)**											
822												
823				**General Statistics**								
824				Number of Valid Observations	8				Number of Distinct Observations	8		
825												
826				**Raw Statistics**					**Log-transformed Statistics**			
827				Minimum	1.106				Minimum of Log Data	0.101		
828				Maximum	5.74				Maximum of Log Data	1.747		
829				Mean	3.884				Mean of log Data	1.138		
830				Median	5.275				SD of log Data	0.777		
831				SD	2.207							
832				Coefficient of Variation	0.568							
833				Skewness	-0.626							
834												
835												
836				**Warning: There are only 8 Values in this data**								
837				**Note: It should be noted that even though bootstrap methods may be performed on this data set,**								
838				**the resulting calculations may not be reliable enough to draw conclusions**								
839												
840				**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**								
841												
842				**Relevant UCL Statistics**								
843				**Normal Distribution Test**					**Lognormal Distribution Test**			
844				Shapiro Wilk Test Statistic	0.709				Shapiro Wilk Test Statistic	0.699		
845				Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value	0.818		
846				**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**			
847												
848				**Assuming Normal Distribution**					**Assuming Lognormal Distribution**			

849				95% Student's-t UCL	5.362					95% H-UCL	9.906	
850			**95% UCLs (Adjusted for Skewness)**							95% Chebyshev (MVUE) UCL	8.961	
851				95% Adjusted-CLT UCL	4.983					97.5% Chebyshev (MVUE) UCL	11.09	
852				95% Modified-t UCL	5.333					99% Chebyshev (MVUE) UCL	15.28	
853												
854			**Gamma Distribution Test**							**Data Distribution**		
855				k star (bias corrected)	1.609					**Data do not follow a Discernable Distribution (0.05)**		
856				Theta Star	2.413							
857				nu star	25.75							
858				Approximate Chi Square Value (.05)	15.19					**Nonparametric Statistics**		
859				Adjusted Level of Significance	0.0195					95% CLT UCL	5.167	
860				Adjusted Chi Square Value	13.18					95% Jackknife UCL	5.362	
861										95% Standard Bootstrap UCL	5.081	
862				Anderson-Darling Test Statistic	1.298					95% Bootstrap-t UCL	5.049	
863				Anderson-Darling 5% Critical Value	0.723					95% Hall's Bootstrap UCL	4.758	
864				Kolmogorov-Smirnov Test Statistic	0.378					95% Percentile Bootstrap UCL	4.989	
865				Kolmogorov-Smirnov 5% Critical Value	0.297					95% BCA Bootstrap UCL	4.958	
866			**Data not Gamma Distributed at 5% Significance Level**							95% Chebyshev(Mean, Sd) UCL	7.285	
867										97.5% Chebyshev(Mean, Sd) UCL	8.757	
868			**Assuming Gamma Distribution**							99% Chebyshev(Mean, Sd) UCL	11.65	
869				95% Approximate Gamma UCL	6.585							
870				95% Adjusted Gamma UCL	7.588							
871												
872			**Potential UCL to Use**							Use 95% Chebyshev (Mean, Sd) UCL	7.285	
873												
874												
875												
876	**Nitrate as Nitrogen (mw-15)**											
877												
878												
879				Number of Valid Observations	7					Number of Distinct Observations	7	
880												
881			**Raw Statistics**							**Log-transformed Statistics**		
882				Minimum	0.723					Minimum of Log Data	-0.325	
883				Maximum	9.73					Maximum of Log Data	2.275	
884				Mean	3.972					Mean of log Data	1.006	
885				Median	4.6					SD of log Data	1.005	
886				SD	3.255							
887				Coefficient of Variation	0.819							
888				Skewness	0.79							
889												
890												
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901												

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the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

902												
903	**Relevant UCL Statistics**											
904	**Normal Distribution Test**						**Lognormal Distribution Test**					
905				Shapiro Wilk Test Statistic	0.888					Shapiro Wilk Test Statistic	0.895	
906				Shapiro Wilk Critical Value	0.803					Shapiro Wilk Critical Value	0.803	
907	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
908												
909	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
910				95% Student's-t UCL	6.363					95% H-UCL	20.79	
911	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	10.99	
912				95% Adjusted-CLT UCL	6.388					97.5% Chebyshev (MVUE) UCL	13.96	
913				95% Modified-t UCL	6.424					99% Chebyshev (MVUE) UCL	19.79	
914												
915	**Gamma Distribution Test**						**Data Distribution**					
916				k star (bias corrected)	0.943		**Data appear Normal at 5% Significance Level**					
917				Theta Star	4.214							
918				nu star	13.2							
919				Approximate Chi Square Value (.05)	6.025		**Nonparametric Statistics**					
920				Adjusted Level of Significance	0.0158					95% CLT UCL	5.996	
921				Adjusted Chi Square Value	4.644					95% Jackknife UCL	6.363	
922										95% Standard Bootstrap UCL	5.803	
923				Anderson-Darling Test Statistic	0.431					95% Bootstrap-t UCL	6.815	
924				Anderson-Darling 5% Critical Value	0.721					95% Hall's Bootstrap UCL	6.528	
925				Kolmogorov-Smirnov Test Statistic	0.247					95% Percentile Bootstrap UCL	5.924	
926				Kolmogorov-Smirnov 5% Critical Value	0.317					95% BCA Bootstrap UCL	6.216	
927	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	9.335	
928										97.5% Chebyshev(Mean, Sd) UCL	11.66	
929	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	16.21	
930				95% Approximate Gamma UCL	8.7							
931				95% Adjusted Gamma UCL	11.29							
932												
933	**Potential UCL to Use**									Use 95% Student's-t UCL	6.363	
934												
935												
936	**Nitrate as Nitrogen (mw-19)**											
937												
938	**General Statistics**											
939				Number of Valid Observations	7					Number of Distinct Observations	7	
940												
941	**Raw Statistics**						**Log-transformed Statistics**					
942				Minimum	0.994					Minimum of Log Data	-0.0065	
943				Maximum	4.9					Maximum of Log Data	1.589	
944				Mean	3.238					Mean of log Data	0.934	
945				Median	4.8					SD of log Data	0.808	
946				SD	2.023							
947				Coefficient of Variation	0.625							
948				Skewness	-0.375							
949												
950												
951	**Warning: A sample size of 'n' = 7 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
952												
953	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
954	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											

955												
956												
957	**Warning: There are only 7 Values in this data**											
958	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
959	**the resulting calculations may not be reliable enough to draw conclusions**											
960												
961	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
962												
963	**Relevant UCL Statistics**											
964	**Normal Distribution Test**						**Lognormal Distribution Test**					
965	Shapiro Wilk Test Statistic	0.685					Shapiro Wilk Test Statistic	0.695				
966	Shapiro Wilk Critical Value	0.803					Shapiro Wilk Critical Value	0.803				
967	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
968												
969	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
970	95% Student's-t UCL	4.724					95% H-UCL	10.05				
971	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	7.804				
972	95% Adjusted-CLT UCL	4.38					97.5% Chebyshev (MVUE) UCL	9.737				
973	95% Modified-t UCL	4.706					99% Chebyshev (MVUE) UCL	13.53				
974												
975	**Gamma Distribution Test**						**Data Distribution**					
976	k star (bias corrected)	1.369					**Data do not follow a Discernable Distribution (0.05)**					
977	Theta Star	2.366										
978	nu star	19.16										
979	Approximate Chi Square Value (.05)	10.24					**Nonparametric Statistics**					
980	Adjusted Level of Significance	0.0158					95% CLT UCL	4.496				
981	Adjusted Chi Square Value	8.341					95% Jackknife UCL	4.724				
982							95% Standard Bootstrap UCL	4.402				
983	Anderson-Darling Test Statistic	1.195					95% Bootstrap-t UCL	4.44				
984	Anderson-Darling 5% Critical Value	0.714					95% Hall's Bootstrap UCL	4.043				
985	Kolmogorov-Smirnov Test Statistic	0.373					95% Percentile Bootstrap UCL	4.328				
986	Kolmogorov-Smirnov 5% Critical Value	0.315					95% BCA Bootstrap UCL	4.324				
987	**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	6.572				
988							97.5% Chebyshev(Mean, Sd) UCL	8.014				
989	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	10.85				
990	95% Approximate Gamma UCL	6.062										
991	95% Adjusted Gamma UCL	7.44										
992												
993	**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	6.572				
994	**Recommended UCL exceeds the maximum observation**											
995												
996												
997	**Nitrate as Nitrogen (mw-20-100)**											
998												
999	**General Statistics**											
1000	Number of Valid Observations	19					Number of Distinct Observations	18				
1001												
1002	**Raw Statistics**						**Log-transformed Statistics**					
1003	Minimum	2.935					Minimum of Log Data	1.077				
1004	Maximum	23.2					Maximum of Log Data	3.144				
1005	Mean	9.501					Mean of log Data	2.132				
1006	Median	9.6					SD of log Data	0.529				
1007	SD	4.593										

1008				Coefficient of Variation	0.483							
1009				Skewness	1.203							
1010												
1011	**Relevant UCL Statistics**											
1012	**Normal Distribution Test**					**Lognormal Distribution Test**						
1013				Shapiro Wilk Test Statistic	0.851					Shapiro Wilk Test Statistic	0.862	
1014				Shapiro Wilk Critical Value	0.901					Shapiro Wilk Critical Value	0.901	
1015	**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**						
1016												
1017	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
1018				95% Student's-t UCL	11.33					95% H-UCL	12.51	
1019	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	14.92	
1020				95% Adjusted-CLT UCL	11.54					97.5% Chebyshev (MVUE) UCL	17.21	
1021				95% Modified-t UCL	11.38					99% Chebyshev (MVUE) UCL	21.7	
1022												
1023	**Gamma Distribution Test**					**Data Distribution**						
1024				k star (bias corrected)	3.706	**Data do not follow a Discernable Distribution (0.05)**						
1025				Theta Star	2.563							
1026				nu star	140.8							
1027				Approximate Chi Square Value (.05)	114.4	**Nonparametric Statistics**						
1028				Adjusted Level of Significance	0.0369					95% CLT UCL	11.23	
1029				Adjusted Chi Square Value	112.3					95% Jackknife UCL	11.33	
1030										95% Standard Bootstrap UCL	11.15	
1031				Anderson-Darling Test Statistic	1.165					95% Bootstrap-t UCL	11.76	
1032				Anderson-Darling 5% Critical Value	0.744					95% Hall's Bootstrap UCL	12.71	
1033				Kolmogorov-Smirnov Test Statistic	0.263					95% Percentile Bootstrap UCL	11.35	
1034				Kolmogorov-Smirnov 5% Critical Value	0.199					95% BCA Bootstrap UCL	11.49	
1035	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	14.09	
1036										97.5% Chebyshev(Mean, Sd) UCL	16.08	
1037	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	19.98	
1038				95% Approximate Gamma UCL	11.69							
1039				95% Adjusted Gamma UCL	11.91							
1040												
1041	**Potential UCL to Use**									Use 95% Chebyshev (Mean, Sd) UCL	14.09	
1042												
1043												
1044	**Nitrate as Nitrogen (mw-20-130)**											
1045												
1046	**General Statistics**											
1047				Number of Valid Observations	19					Number of Distinct Observations	16	
1048												
1049	**Raw Statistics**					**Log-transformed Statistics**						
1050				Minimum	6.097					Minimum of Log Data	1.808	
1051				Maximum	20.4					Maximum of Log Data	3.016	
1052				Mean	10.04					Mean of log Data	2.264	
1053				Median	10.6					SD of log Data	0.296	
1054				SD	3.195							
1055				Coefficient of Variation	0.318							
1056				Skewness	1.677							
1057												
1058	**Relevant UCL Statistics**											
1059	**Normal Distribution Test**					**Lognormal Distribution Test**						
1060				Shapiro Wilk Test Statistic	0.786					Shapiro Wilk Test Statistic	0.863	

1061					Shapiro Wilk Critical Value	0.901					Shapiro Wilk Critical Value	0.901
1062	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1063												
1064	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1065					95% Student's-t UCL	11.31					95% H-UCL	11.44
1066	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	13.04
1067					95% Adjusted-CLT UCL	11.55					97.5% Chebyshev (MVUE) UCL	14.34
1068					95% Modified-t UCL	11.36					99% Chebyshev (MVUE) UCL	16.9
1069												
1070	**Gamma Distribution Test**						**Data Distribution**					
1071					k star (bias corrected)	10.06	**Data do not follow a Discernable Distribution (0.05)**					
1072					Theta Star	0.999						
1073					nu star	382.2						
1074					Approximate Chi Square Value (.05)	337.8	**Nonparametric Statistics**					
1075					Adjusted Level of Significance	0.0369					95% CLT UCL	11.25
1076					Adjusted Chi Square Value	334.2					95% Jackknife UCL	11.31
1077											95% Standard Bootstrap UCL	11.23
1078					Anderson-Darling Test Statistic	1.134					95% Bootstrap-t UCL	11.69
1079					Anderson-Darling 5% Critical Value	0.741					95% Hall's Bootstrap UCL	13.54
1080					Kolmogorov-Smirnov Test Statistic	0.22					95% Percentile Bootstrap UCL	11.21
1081					Kolmogorov-Smirnov 5% Critical Value	0.198					95% BCA Bootstrap UCL	11.58
1082	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	13.24
1083											97.5% Chebyshev(Mean, Sd) UCL	14.62
1084	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	17.34
1085					95% Approximate Gamma UCL	11.36						
1086					95% Adjusted Gamma UCL	11.48						
1087												
1088	**Potential UCL to Use**										Use 95% Student's-t UCL	11.31
1089											or 95% Modified-t UCL	11.36
1090												
1091												
1092	**Nitrate as Nitrogen (mw-20-70)**											
1093												
1094	**General Statistics**											
1095					Number of Valid Observations	20					Number of Distinct Observations	19
1096												
1097	**Raw Statistics**						**Log-transformed Statistics**					
1098					Minimum	2.484					Minimum of Log Data	0.91
1099					Maximum	25.1					Maximum of Log Data	3.223
1100					Mean	10.55					Mean of log Data	2.261
1101					Median	9.835					SD of log Data	0.485
1102					SD	4.533						
1103					Coefficient of Variation	0.43						
1104					Skewness	1.468						
1105												
1106	**Relevant UCL Statistics**											
1107	**Normal Distribution Test**						**Lognormal Distribution Test**					
1108					Shapiro Wilk Test Statistic	0.801					Shapiro Wilk Test Statistic	0.789
1109					Shapiro Wilk Critical Value	0.905					Shapiro Wilk Critical Value	0.905
1110	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1111												
1112	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1113					95% Student's-t UCL	12.3					95% H-UCL	13.44

1114	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	15.95	
1115	95% Adjusted-CLT UCL	12.57								97.5% Chebyshev (MVUE) UCL	18.21	
1116	95% Modified-t UCL	12.36								99% Chebyshev (MVUE) UCL	22.66	
1117												
1118	**Gamma Distribution Test**									**Data Distribution**		
1119	k star (bias corrected)	4.623								**Data do not follow a Discernable Distribution (0.05)**		
1120	Theta Star	2.282										
1121	nu star	184.9										
1122	Approximate Chi Square Value (.05)	154.4								**Nonparametric Statistics**		
1123	Adjusted Level of Significance	0.038								95% CLT UCL	12.22	
1124	Adjusted Chi Square Value	152.2								95% Jackknife UCL	12.3	
1125										95% Standard Bootstrap UCL	12.17	
1126	Anderson-Darling Test Statistic	1.695								95% Bootstrap-t UCL	12.75	
1127	Anderson-Darling 5% Critical Value	0.745								95% Hall's Bootstrap UCL	14.96	
1128	Kolmogorov-Smirnov Test Statistic	0.261								95% Percentile Bootstrap UCL	12.31	
1129	Kolmogorov-Smirnov 5% Critical Value	0.194								95% BCA Bootstrap UCL	12.46	
1130	**Data not Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	14.97	
1131										97.5% Chebyshev(Mean, Sd) UCL	16.88	
1132	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	20.63	
1133	95% Approximate Gamma UCL	12.63										
1134	95% Adjusted Gamma UCL	12.81										
1135												
1136	**Potential UCL to Use**									Use 95% Student's-t UCL	12.3	
1137										or 95% Modified-t UCL	12.36	
1138												
1139												
1140	**Nitrate as Nitrogen (mw-21)**											
1141												
1142	**General Statistics**											
1143	Number of Valid Observations	4								Number of Distinct Observations	4	
1144												
1145												
1146	**Warning: This data set only has 4 observations!**											
1147	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1148	**The data set for variable Nitrate as Nitrogen (mw-21) was not processed!**											
1149												
1150	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1151	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1152												
1153												
1154												
1155	**Nitrate as Nitrogen (mw-22)**											
1156												
1157	**General Statistics**											
1158	Number of Valid Data	8								Number of Detected Data	3	
1159	Number of Distinct Detected Data	3								Number of Non-Detect Data	5	
1160										Percent Non-Detects	62.50%	
1161												
1162	**Raw Statistics**									**Log-transformed Statistics**		
1163	Minimum Detected	2.935								Minimum Detected	1.077	
1164	Maximum Detected	6.751								Maximum Detected	1.91	
1165	Mean of Detected	4.96								Mean of Detected	1.545	
1166	SD of Detected	1.919								SD of Detected	0.426	

1167				Minimum Non-Detect	0.5					Minimum Non-Detect	-0.693	
1168				Maximum Non-Detect	4					Maximum Non-Detect	1.386	
1169												
1170	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	6	
1171	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	2	
1172	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	75.00%	
1173												
1174	**Warning: There are only 3 Distinct Detected Values in this data set**											
1175	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1176	**Those methods will return a 'N/A' value on your output display!**											
1177												
1178	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1179	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1180												
1181												
1182	**UCL Statistics**											
1183	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
1184				Shapiro Wilk Test Statistic	0.989					Shapiro Wilk Test Statistic	0.956	
1185				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
1186	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
1187												
1188	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
1189				DL/2 Substitution Method						DL/2 Substitution Method		
1190				Mean	2.36					Mean	0.233	
1191				SD	2.449					SD	1.303	
1192				95% DL/2 (t) UCL	4.001					95% H-Stat (DL/2) UCL	3.416	
1193												
1194				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1195	**MLE method failed to converge properly**									Mean in Log Scale	0.738	
1196										SD in Log Scale	0.723	
1197										Mean in Original Scale	2.679	
1198										SD in Original Scale	2.158	
1199										95% Percentile Bootstrap UCL	3.926	
1200										95% BCA Bootstrap UCL	4.164	
1201												
1202	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
1203				k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**		
1204				Theta Star	N/A							
1205				nu star	N/A							
1206												
1207				A-D Test Statistic	0.289					**Nonparametric Statistics**		
1208				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
1209				K-S Test Statistic	N/A					Mean	3.695	
1210				5% K-S Critical Value	N/A					SD	1.372	
1211	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.594	
1212										95% KM (t) UCL	4.82	
1213	**Assuming Gamma Distribution**									95% KM (z) UCL	4.672	
1214				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	5.319	
1215				Minimum	N/A					95% KM (bootstrap t) UCL	4.624	
1216				Maximum	N/A					95% KM (BCA) UCL	6.751	
1217				Mean	N/A					95% KM (Percentile Bootstrap) UCL	6.751	
1218				Median	N/A					95% KM (Chebyshev) UCL	6.283	
1219				SD	N/A					97.5% KM (Chebyshev) UCL	7.404	

1220					k star	N/A					99% KM (Chebyshev) UCL	9.604
1221					Theta star	N/A						
1222					Nu star	N/A					**Potential UCLs to Use**	
1223					AppChi2	N/A					95% KM (t) UCL	4.82
1224					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	6.751
1225					95% Adjusted Gamma UCL	N/A						
1226	**Note: DL/2 is not a recommended method.**											
1227												
1228												
1229	**Nitrate as Nitrogen (mw-23)**											
1230												
1231	**General Statistics**											
1232	Number of Valid Observations	6					Number of Distinct Observations	6				
1233												
1234	**Raw Statistics**						**Log-transformed Statistics**					
1235	Minimum	0.86					Minimum of Log Data	-0.151				
1236	Maximum	3.839					Maximum of Log Data	1.345				
1237	Mean	3.074					Mean of log Data	1.019				
1238	Median	3.565					SD of log Data	0.581				
1239	SD	1.128										
1240	Coefficient of Variation	0.367										
1241	Skewness	-2.081										
1242												
1243												
1244	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
1245												
1246	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
1247	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1248												
1249												
1250	**Warning: There are only 6 Values in this data**											
1251	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
1252	**the resulting calculations may not be reliable enough to draw conclusions**											
1253												
1254	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
1255												
1256	**Relevant UCL Statistics**											
1257	**Normal Distribution Test**						**Lognormal Distribution Test**					
1258	Shapiro Wilk Test Statistic	0.714					Shapiro Wilk Test Statistic	0.626				
1259	Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788				
1260	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1261												
1262	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1263	95% Student's-t UCL	4.002					95% H-UCL	6.86				
1264	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	6.461				
1265	95% Adjusted-CLT UCL	3.413					97.5% Chebyshev (MVUE) UCL	7.88				
1266	95% Modified-t UCL	3.937					99% Chebyshev (MVUE) UCL	10.67				
1267												
1268	**Gamma Distribution Test**						**Data Distribution**					
1269	k star (bias corrected)	2.604					**Data do not follow a Discernable Distribution (0.05)**					
1270	Theta Star	1.18										
1271	nu star	31.25										
1272	Approximate Chi Square Value (.05)	19.48					**Nonparametric Statistics**					

1273				Adjusted Level of Significance	0.0122					95% CLT UCL	3.831	
1274				Adjusted Chi Square Value	16.22					95% Jackknife UCL	4.002	
1275										95% Standard Bootstrap UCL	3.778	
1276				Anderson-Darling Test Statistic	1.119					95% Bootstrap-t UCL	3.69	
1277				Anderson-Darling 5% Critical Value	0.698					95% Hall's Bootstrap UCL	3.512	
1278				Kolmogorov-Smirnov Test Statistic	0.353					95% Percentile Bootstrap UCL	3.648	
1279				Kolmogorov-Smirnov 5% Critical Value	0.333					95% BCA Bootstrap UCL	3.585	
1280				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	5.081	
1281										97.5% Chebyshev(Mean, Sd) UCL	5.949	
1282				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	7.655	
1283				95% Approximate Gamma UCL	4.932							
1284				95% Adjusted Gamma UCL	5.925							
1285												
1286				**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	5.081	
1287												
1288												
1289												
1290	**Nitrate as Nitrogen (mw-24a)**											
1291												
1292												
1293				Number of Valid Observations	7					Number of Distinct Observations	7	
1294												
1295				**Raw Statistics**						**Log-transformed Statistics**		
1296				Minimum	3.477					Minimum of Log Data	1.246	
1297				Maximum	18.3					Maximum of Log Data	2.907	
1298				Mean	11.17					Mean of log Data	2.227	
1299				Median	15					SD of log Data	0.708	
1300				SD	6.278							
1301				Coefficient of Variation	0.562							
1302				Skewness	-0.321							
1303												
1304												
1305				**Warning: A sample size of 'n' = 7 may not adequate enough to compute meaningful and reliable test statistics and estimates!**								
1306												
1307				**It is suggested to collect at least 8 to 10 observations using these statistical methods!**								
1308				**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**								
1309												
1310												
1311				**Warning: There are only 7 Values in this data**								
1312				**Note: It should be noted that even though bootstrap methods may be performed on this data set,**								
1313				**the resulting calculations may not be reliable enough to draw conclusions**								
1314												
1315				**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**								
1316												
1317				**Relevant UCL Statistics**								
1318				**Normal Distribution Test**						**Lognormal Distribution Test**		
1319				Shapiro Wilk Test Statistic	0.835					Shapiro Wilk Test Statistic	0.819	
1320				Shapiro Wilk Critical Value	0.803					Shapiro Wilk Critical Value	0.803	
1321				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
1322												
1323				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
1324				95% Student's-t UCL	15.78					95% H-UCL	27.76	
1325				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	24.87	

1326				95% Adjusted-CLT UCL	14.76					97.5% Chebyshev (MVUE) UCL	30.68
1327				95% Modified-t UCL	15.73					99% Chebyshev (MVUE) UCL	42.1
1328											
1329				**Gamma Distribution Test**						**Data Distribution**	
1330				k star (bias corrected)	1.721					**Data appear Normal at 5% Significance Level**	
1331				Theta Star	6.49						
1332				nu star	24.09						
1333				Approximate Chi Square Value (.05)	13.92					**Nonparametric Statistics**	
1334				Adjusted Level of Significance	0.0158					95% CLT UCL	15.07
1335				Adjusted Chi Square Value	11.65					95% Jackknife UCL	15.78
1336										95% Standard Bootstrap UCL	14.86
1337				Anderson-Darling Test Statistic	0.701					95% Bootstrap-t UCL	15.37
1338				Anderson-Darling 5% Critical Value	0.713					95% Hall's Bootstrap UCL	13.83
1339				Kolmogorov-Smirnov Test Statistic	0.335					95% Percentile Bootstrap UCL	14.86
1340				Kolmogorov-Smirnov 5% Critical Value	0.314					95% BCA Bootstrap UCL	14.68
1341				**Data follow Appr. Gamma Distribution at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	21.51
1342										97.5% Chebyshev(Mean, Sd) UCL	25.99
1343				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	34.78
1344				95% Approximate Gamma UCL	19.33						
1345				95% Adjusted Gamma UCL	23.09						
1346											
1347				**Potential UCL to Use**						Use 95% Student's-t UCL	15.78
1348											
1349											
1350	**Nitrate as Nitrogen (mw-24b)**										
1351											
1352				**General Statistics**							
1353				Number of Valid Observations	8					Number of Distinct Observations	8
1354											
1355				**Raw Statistics**						**Log-transformed Statistics**	
1356				Minimum	3.161					Minimum of Log Data	1.151
1357				Maximum	16					Maximum of Log Data	2.773
1358				Mean	11					Mean of log Data	2.294
1359				Median	11.8					SD of log Data	0.542
1360				SD	4.456						
1361				Coefficient of Variation	0.405						
1362				Skewness	-0.661						
1363											
1364											
1365				**Warning: There are only 8 Values in this data**							
1366				**Note: It should be noted that even though bootstrap methods may be performed on this data set,**							
1367				**the resulting calculations may not be reliable enough to draw conclusions**							
1368											
1369				**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**							
1370											
1371				**Relevant UCL Statistics**							
1372				**Normal Distribution Test**						**Lognormal Distribution Test**	
1373				Shapiro Wilk Test Statistic	0.942					Shapiro Wilk Test Statistic	0.847
1374				Shapiro Wilk Critical Value	0.818					Shapiro Wilk Critical Value	0.818
1375				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
1376											
1377				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
1378				95% Student's-t UCL	13.99					95% H-UCL	18.89

1379	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	20.77	
1380	95% Adjusted-CLT UCL	13.2								97.5% Chebyshev (MVUE) UCL	24.88	
1381	95% Modified-t UCL	13.93								99% Chebyshev (MVUE) UCL	32.97	
1382												
1383	**Gamma Distribution Test**									**Data Distribution**		
1384	k star (bias corrected)	3.185								**Data appear Normal at 5% Significance Level**		
1385	Theta Star	3.454										
1386	nu star	50.97										
1387	Approximate Chi Square Value (.05)	35.57								**Nonparametric Statistics**		
1388	Adjusted Level of Significance	0.0195								95% CLT UCL	13.59	
1389	Adjusted Chi Square Value	32.35								95% Jackknife UCL	13.99	
1390										95% Standard Bootstrap UCL	13.42	
1391	Anderson-Darling Test Statistic	0.42								95% Bootstrap-t UCL	13.6	
1392	Anderson-Darling 5% Critical Value	0.719								95% Hall's Bootstrap UCL	13.15	
1393	Kolmogorov-Smirnov Test Statistic	0.223								95% Percentile Bootstrap UCL	13.5	
1394	Kolmogorov-Smirnov 5% Critical Value	0.295								95% BCA Bootstrap UCL	13.22	
1395	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	17.87	
1396										97.5% Chebyshev(Mean, Sd) UCL	20.84	
1397	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	26.68	
1398	95% Approximate Gamma UCL	15.76										
1399	95% Adjusted Gamma UCL	17.34										
1400												
1401	**Potential UCL to Use**									Use 95% Student's-t UCL	13.99	
1402												
1403												
1404	**Nitrate as Nitrogen (mw-24br)**											
1405												
1406	**General Statistics**											
1407	Number of Valid Data	6								Number of Detected Data	3	
1408	Number of Distinct Detected Data	3								Number of Non-Detect Data	3	
1409										Percent Non-Detects	50.00%	
1410												
1411	**Raw Statistics**									**Log-transformed Statistics**		
1412	Minimum Detected	1.829								Minimum Detected	0.604	
1413	Maximum Detected	3.161								Maximum Detected	1.151	
1414	Mean of Detected	2.514								Mean of Detected	0.897	
1415	SD of Detected	0.667								SD of Detected	0.276	
1416	Minimum Non-Detect	0.5								Minimum Non-Detect	-0.693	
1417	Maximum Non-Detect	4								Maximum Non-Detect	1.386	
1418												
1419	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	6	
1420	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
1421	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
1422												
1423	**Warning: There are only 3 Distinct Detected Values in this data set**											
1424	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1425	**Those methods will return a 'N/A' value on your output display!**											
1426												
1427	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1428	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1429												
1430												
1431	**UCL Statistics**											

	A	B	C	D	E	F	G	H	I	J	K	L
1432	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1433					Shapiro Wilk Test Statistic	0.998					Shapiro Wilk Test Statistic	0.985
1434					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
1435	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1436												
1437	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1438					DL/2 Substitution Method						DL/2 Substitution Method	
1439					Mean	1.799					Mean	0.333
1440					SD	1.049					SD	0.928
1441					95% DL/2 (t) UCL	2.661					95% H-Stat (DL/2) UCL	3.059
1442												
1443					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1444	**MLE method failed to converge properly**										Mean in Log Scale	0.663
1445											SD in Log Scale	0.342
1446											Mean in Original Scale	2.039
1447											SD in Original Scale	0.707
1448											95% Percentile Bootstrap UCL	2.465
1449											95% BCA Bootstrap UCL	2.531
1450												
1451	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1452					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
1453					Theta Star	N/A						
1454					nu star	N/A						
1455												
1456					A-D Test Statistic	0.259	**Nonparametric Statistics**					
1457					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
1458					K-S Test Statistic	N/A					Mean	2.24
1459					5% K-S Critical Value	N/A					SD	0.539
1460	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.295
1461											95% KM (t) UCL	2.835
1462	**Assuming Gamma Distribution**										95% KM (z) UCL	2.726
1463					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	2.901
1464					Minimum	N/A					95% KM (bootstrap t) UCL	2.616
1465					Maximum	N/A					95% KM (BCA) UCL	3.161
1466					Mean	N/A					95% KM (Percentile Bootstrap) UCL	3.161
1467					Median	N/A					95% KM (Chebyshev) UCL	3.527
1468					SD	N/A					97.5% KM (Chebyshev) UCL	4.084
1469					k star	N/A					99% KM (Chebyshev) UCL	5.177
1470					Theta star	N/A						
1471					Nu star	N/A	**Potential UCLs to Use**					
1472					AppChi2	N/A					95% KM (t) UCL	2.835
1473					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	3.161
1474					95% Adjusted Gamma UCL	N/A						
1475	**Note: DL/2 is not a recommended method.**											
1476												
1477												
1478	**Nitrate as Nitrogen (mw-25)**											
1479												
1480	**General Statistics**											
1481					Number of Valid Observations	16					Number of Distinct Observations	13
1482												
1483	**Raw Statistics**						**Log-transformed Statistics**					
1484					Minimum	1.219					Minimum of Log Data	0.198

1485					Maximum	4.58					Maximum of Log Data	1.522
1486					Mean	3.514					Mean of log Data	1.187
1487					Median	3.935					SD of log Data	0.433
1488					SD	1.076						
1489					Coefficient of Variation	0.306						
1490					Skewness	-1.606						
1491												
1492	**Relevant UCL Statistics**											
1493	**Normal Distribution Test**						**Lognormal Distribution Test**					
1494					Shapiro Wilk Test Statistic	0.693					Shapiro Wilk Test Statistic	0.628
1495					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
1496	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1497												
1498	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1499					95% Student's-t UCL	3.986					95% H-UCL	4.494
1500	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	5.307
1501					95% Adjusted-CLT UCL	3.841					97.5% Chebyshev (MVUE) UCL	6.055
1502					95% Modified-t UCL	3.968					99% Chebyshev (MVUE) UCL	7.525
1503												
1504	**Gamma Distribution Test**						**Data Distribution**					
1505					k star (bias corrected)	5.986	**Data do not follow a Discernable Distribution (0.05)**					
1506					Theta Star	0.587						
1507					nu star	191.5						
1508					Approximate Chi Square Value (.05)	160.5	**Nonparametric Statistics**					
1509					Adjusted Level of Significance	0.0335					95% CLT UCL	3.957
1510					Adjusted Chi Square Value	157.3					95% Jackknife UCL	3.986
1511											95% Standard Bootstrap UCL	3.943
1512					Anderson-Darling Test Statistic	2.794					95% Bootstrap-t UCL	3.912
1513					Anderson-Darling 5% Critical Value	0.74					95% Hall's Bootstrap UCL	3.836
1514					Kolmogorov-Smirnov Test Statistic	0.399					95% Percentile Bootstrap UCL	3.915
1515					Kolmogorov-Smirnov 5% Critical Value	0.215					95% BCA Bootstrap UCL	3.869
1516	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	4.687
1517											97.5% Chebyshev(Mean, Sd) UCL	5.194
1518	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	6.19
1519					95% Approximate Gamma UCL	4.193						
1520					95% Adjusted Gamma UCL	4.28						
1521												
1522	**Potential UCL to Use**										Use 95% Student's-t UCL	3.986
1523											or 95% Modified-t UCL	3.968
1524												
1525												
1526	**Nitrate as Nitrogen (mw-26)**											
1527												
1528	**General Statistics**											
1529					Number of Valid Observations	17					Number of Distinct Observations	14
1530												
1531	**Raw Statistics**						**Log-transformed Statistics**					
1532					Minimum	1.332					Minimum of Log Data	0.287
1533					Maximum	7.84					Maximum of Log Data	2.059
1534					Mean	4.678					Mean of log Data	1.459
1535					Median	4.9					SD of log Data	0.473
1536					SD	1.624						
1537					Coefficient of Variation	0.347						

1538					Skewness	-0.686						
1539												
1540	**Relevant UCL Statistics**											
1541	**Normal Distribution Test**						**Lognormal Distribution Test**					
1542					Shapiro Wilk Test Statistic	0.861					Shapiro Wilk Test Statistic	0.747
1543					Shapiro Wilk Critical Value	0.892					Shapiro Wilk Critical Value	0.892
1544	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1545												
1546	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1547					95% Student's-t UCL	5.366					95% H-UCL	6.1
1548	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	7.236
1549					95% Adjusted-CLT UCL	5.256					97.5% Chebyshev (MVUE) UCL	8.3
1550					95% Modified-t UCL	5.355					99% Chebyshev (MVUE) UCL	10.39
1551												
1552	**Gamma Distribution Test**						**Data Distribution**					
1553					k star (bias corrected)	5.067	**Data do not follow a Discernable Distribution (0.05)**					
1554					Theta Star	0.923						
1555					nu star	172.3						
1556					Approximate Chi Square Value (.05)	142.9	**Nonparametric Statistics**					
1557					Adjusted Level of Significance	0.0346					95% CLT UCL	5.326
1558					Adjusted Chi Square Value	140.1					95% Jackknife UCL	5.366
1559											95% Standard Bootstrap UCL	5.292
1560					Anderson-Darling Test Statistic	1.839					95% Bootstrap-t UCL	5.278
1561					Anderson-Darling 5% Critical Value	0.741					95% Hall's Bootstrap UCL	5.272
1562					Kolmogorov-Smirnov Test Statistic	0.335					95% Percentile Bootstrap UCL	5.297
1563					Kolmogorov-Smirnov 5% Critical Value	0.21					95% BCA Bootstrap UCL	5.24
1564	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	6.396
1565											97.5% Chebyshev(Mean, Sd) UCL	7.139
1566	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	8.598
1567					95% Approximate Gamma UCL	5.639						
1568					95% Adjusted Gamma UCL	5.752						
1569												
1570	**Potential UCL to Use**										Use 95% Student's-t UCL	5.366
1571											or 95% Modified-t UCL	5.355
1572												
1573												
1574	**Nitrate as Nitrogen (mw-27-20)**											
1575												
1576	**General Statistics**											
1577					Number of Valid Data	17					Number of Detected Data	3
1578					Number of Distinct Detected Data	3					Number of Non-Detect Data	14
1579											Percent Non-Detects	82.35%
1580												
1581	**Raw Statistics**						**Log-transformed Statistics**					
1582					Minimum Detected	0.181					Minimum Detected	-1.711
1583					Maximum Detected	0.271					Maximum Detected	-1.306
1584					Mean of Detected	0.226					Mean of Detected	-1.502
1585					SD of Detected	0.0452					SD of Detected	0.203
1586					Minimum Non-Detect	0.2					Minimum Non-Detect	-1.609
1587					Maximum Non-Detect	1					Maximum Non-Detect	0
1588												
1589	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	17
1590	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0

1591	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1592												
1593	**Warning: There are only 3 Distinct Detected Values in this data set**											
1594	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1595	**Those methods will return a 'N/A' value on your output display!**											
1596												
1597	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1598	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1599												
1600												
1601	**UCL Statistics**											
1602	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1603	Shapiro Wilk Test Statistic				1		Shapiro Wilk Test Statistic				0.997	
1604	5% Shapiro Wilk Critical Value				0.767		5% Shapiro Wilk Critical Value				0.767	
1605	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1606												
1607	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1608	DL/2 Substitution Method						DL/2 Substitution Method					
1609	Mean				0.219		Mean				-1.608	
1610	SD				0.0959		SD				0.449	
1611	95% DL/2 (t) UCL				0.26		95% H-Stat (DL/2) UCL				0.265	
1612												
1613	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
1614	**MLE method failed to converge properly**						Mean in Log Scale				-1.638	
1615							SD in Log Scale				0.165	
1616							Mean in Original Scale				0.197	
1617							SD in Original Scale				0.0333	
1618							95% Percentile Bootstrap UCL				0.21	
1619							95% BCA Bootstrap UCL				0.211	
1620												
1621	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1622	k star (bias corrected)				N/A		**Data appear Normal at 5% Significance Level**					
1623	Theta Star				N/A							
1624	nu star				N/A							
1625												
1626	A-D Test Statistic				0.248		**Nonparametric Statistics**					
1627	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
1628	K-S Test Statistic				N/A		Mean				0.2	
1629	5% K-S Critical Value				N/A		SD				0.0329	
1630	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean				0.0152	
1631							95% KM (t) UCL				0.227	
1632	**Assuming Gamma Distribution**						95% KM (z) UCL				0.225	
1633	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL				0.232	
1634	Minimum				N/A		95% KM (bootstrap t) UCL				0.223	
1635	Maximum				N/A		95% KM (BCA) UCL				0.271	
1636	Mean				N/A		95% KM (Percentile Bootstrap) UCL				N/A	
1637	Median				N/A		95% KM (Chebyshev) UCL				0.266	
1638	SD				N/A		97.5% KM (Chebyshev) UCL				0.295	
1639	k star				N/A		99% KM (Chebyshev) UCL				0.352	
1640	Theta star				N/A							
1641	Nu star				N/A		**Potential UCLs to Use**					
1642	AppChi2				N/A		95% KM (t) UCL				0.227	
1643	95% Gamma Approximate UCL				N/A		95% KM (Percentile Bootstrap) UCL				N/A	

1644					95% Adjusted Gamma UCL	N/A						
1645	**Note: DL/2 is not a recommended method.**											
1646												
1647												
1648	**Nitrate as Nitrogen (mw-27-60)**											
1649												
1650	**General Statistics**											
1651					Number of Valid Data	4			Number of Detected Data	0		
1652					Number of Distinct Detected Data	0			Number of Non-Detect Data	4		
1653									Percent Non-Detects	100.00%		
1654												
1655	**Warning: This data set only has 4 observations!**											
1656	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1657	**The data set for variable Nitrate as Nitrogen (mw-27-60) was not processed!**											
1658												
1659	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1660	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1661												
1662												
1663												
1664	**Nitrate as Nitrogen (mw-27-85)**											
1665												
1666	**General Statistics**											
1667					Number of Valid Data	4			Number of Detected Data	0		
1668					Number of Distinct Detected Data	0			Number of Non-Detect Data	4		
1669									Percent Non-Detects	100.00%		
1670												
1671	**Warning: This data set only has 4 observations!**											
1672	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1673	**The data set for variable Nitrate as Nitrogen (mw-27-85) was not processed!**											
1674												
1675	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1676	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1677												
1678												
1679												
1680	**Nitrate as Nitrogen (mw-28-25)**											
1681												
1682	**General Statistics**											
1683					Number of Valid Data	17			Number of Detected Data	3		
1684					Number of Distinct Detected Data	3			Number of Non-Detect Data	14		
1685									Percent Non-Detects	82.35%		
1686												
1687	**Raw Statistics**								**Log-transformed Statistics**			
1688					Minimum Detected	0.271			Minimum Detected	-1.306		
1689					Maximum Detected	0.474			Maximum Detected	-0.746		
1690					Mean of Detected	0.399			Mean of Detected	-0.949		
1691					SD of Detected	0.111			SD of Detected	0.31		
1692					Minimum Non-Detect	0.2			Minimum Non-Detect	-1.609		
1693					Maximum Non-Detect	1			Maximum Non-Detect	0		
1694												
1695	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	17		
1696	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	0		

1697	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1698												
1699	**Warning: There are only 3 Distinct Detected Values in this data set**											
1700	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1701	**Those methods will return a 'N/A' value on your output display!**											
1702												
1703	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1704	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1705												
1706												
1707	**UCL Statistics**											
1708	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1709	Shapiro Wilk Test Statistic				0.832		Shapiro Wilk Test Statistic					0.815
1710	5% Shapiro Wilk Critical Value				0.767		5% Shapiro Wilk Critical Value					0.767
1711	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1712												
1713	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1714	DL/2 Substitution Method						DL/2 Substitution Method					
1715	Mean				0.27		Mean					-1.375
1716	SD				0.106		SD					0.378
1717	95% DL/2 (t) UCL				0.315		95% H-Stat (DL/2) UCL					0.29
1718												
1719	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
1720	**MLE method failed to converge properly**						Mean in Log Scale					-1.345
1721							SD in Log Scale					0.374
1722							Mean in Original Scale					0.278
1723							SD in Original Scale					0.107
1724							95% Percentile Bootstrap UCL					0.321
1725							95% BCA Bootstrap UCL					0.325
1726												
1727	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1728	k star (bias corrected)				N/A		**Data appear Normal at 5% Significance Level**					
1729	Theta Star				N/A							
1730	nu star				N/A							
1731												
1732	A-D Test Statistic				0.509		**Nonparametric Statistics**					
1733	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
1734	K-S Test Statistic				N/A		Mean					0.319
1735	5% K-S Critical Value				N/A		SD					0.0833
1736	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0361
1737							95% KM (t) UCL					0.382
1738	**Assuming Gamma Distribution**						95% KM (z) UCL					0.378
1739	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.428
1740	Minimum				N/A		95% KM (bootstrap t) UCL					0.356
1741	Maximum				N/A		95% KM (BCA) UCL					0.474
1742	Mean				N/A		95% KM (Percentile Bootstrap) UCL					0.474
1743	Median				N/A		95% KM (Chebyshev) UCL					0.476
1744	SD				N/A		97.5% KM (Chebyshev) UCL					0.544
1745	k star				N/A		99% KM (Chebyshev) UCL					0.678
1746	Theta star				N/A							
1747	Nu star				N/A		**Potential UCLs to Use**					
1748	AppChi2				N/A		95% KM (t) UCL					0.382
1749	95% Gamma Approximate UCL				N/A		95% KM (Percentile Bootstrap) UCL					0.474

1750				95% Adjusted Gamma UCL		N/A						
1751	Note: DL/2 is not a recommended method.											
1752												
1753												
1754	Nitrate as Nitrogen (mw-28-90)											
1755												
1756						General Statistics						
1757					Number of Valid Data	4			Number of Detected Data	1		
1758					Number of Distinct Detected Data	1			Number of Non-Detect Data	3		
1759									Percent Non-Detects	75.00%		
1760												
1761						Warning: This data set only has 4 observations!						
1762						Data set is too small to compute reliable and meaningful statistics and estimates!						
1763						The data set for variable Nitrate as Nitrogen (mw-28-90) was not processed!						
1764												
1765						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
1766						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
1767												
1768												
1769												
1770	Nitrate as Nitrogen (mw-29)											
1771												
1772						General Statistics						
1773					Number of Valid Data	6			Number of Detected Data	3		
1774					Number of Distinct Detected Data	3			Number of Non-Detect Data	3		
1775									Percent Non-Detects	50.00%		
1776												
1777					Raw Statistics				Log-transformed Statistics			
1778					Minimum Detected	0.203			Minimum Detected	-1.593		
1779					Maximum Detected	0.723			Maximum Detected	-0.325		
1780					Mean of Detected	0.467			Mean of Detected	-0.888		
1781					SD of Detected	0.26			SD of Detected	0.646		
1782					Minimum Non-Detect	0.2			Minimum Non-Detect	-1.609		
1783					Maximum Non-Detect	0.5			Maximum Non-Detect	-0.693		
1784												
1785	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	5		
1786	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	1		
1787	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	83.33%		
1788												
1789						Warning: There are only 3 Distinct Detected Values in this data set						
1790						The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.						
1791						Those methods will return a 'N/A' value on your output display!						
1792												
1793						It is necessary to have 4 or more Distinct Values for bootstrap methods.						
1794						It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.						
1795												
1796												
1797						UCL Statistics						
1798					Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only			
1799					Shapiro Wilk Test Statistic	0.999			Shapiro Wilk Test Statistic	0.964		
1800					5% Shapiro Wilk Critical Value	0.767			5% Shapiro Wilk Critical Value	0.767		
1801					Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
1802												

1803	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1804				DL/2 Substitution Method						DL/2 Substitution Method		
1805				Mean		0.325				Mean		-1.327
1806				SD		0.231				SD		0.7
1807				95% DL/2 (t) UCL		0.515				95% H-Stat (DL/2) UCL		0.37
1808												
1809				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
1810	**MLE method failed to converge properly**									Mean in Log Scale		-1.409
1811										SD in Log Scale		0.735
1812										Mean in Original Scale		0.309
1813										SD in Original Scale		0.241
1814										95% Percentile Bootstrap UCL		0.462
1815										95% BCA Bootstrap UCL		0.49
1816												
1817	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1818				k star (bias corrected)		N/A	**Data appear Normal at 5% Significance Level**					
1819				Theta Star		N/A						
1820				nu star		N/A						
1821												
1822				A-D Test Statistic		0.273	**Nonparametric Statistics**					
1823				5% A-D Critical Value		N/A				Kaplan-Meier (KM) Method		
1824				K-S Test Statistic		N/A				Mean		0.346
1825				5% K-S Critical Value		N/A				SD		0.199
1826	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.103
1827										95% KM (t) UCL		0.554
1828	**Assuming Gamma Distribution**									95% KM (z) UCL		0.516
1829				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.583
1830				Minimum		N/A				95% KM (bootstrap t) UCL		0.461
1831				Maximum		N/A				95% KM (BCA) UCL		N/A
1832				Mean		N/A				95% KM (Percentile Bootstrap) UCL		0.723
1833				Median		N/A				95% KM (Chebyshev) UCL		0.796
1834				SD		N/A				97.5% KM (Chebyshev) UCL		0.991
1835				k star		N/A				99% KM (Chebyshev) UCL		1.374
1836				Theta star		N/A						
1837				Nu star		N/A	**Potential UCLs to Use**					
1838				AppChi2		N/A				95% KM (t) UCL		0.554
1839				95% Gamma Approximate UCL		N/A				95% KM (Percentile Bootstrap) UCL		0.723
1840				95% Adjusted Gamma UCL		N/A						
1841	**Note: DL/2 is not a recommended method.**											
1842												
1843												
1844	**Nitrate as Nitrogen (mw-3)**											
1845												
1846	**General Statistics**											
1847				Number of Valid Observations		2				Number of Distinct Observations		2
1848												
1849												
1850	**Warning: This data set only has 2 observations!**											
1851	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1852	**The data set for variable Nitrate as Nitrogen (mw-3) was not processed!**											
1853												
1854	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1855	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											

1856												
1857												
1858												
1859	**Nitrate as Nitrogen (mw-30-30)**											
1860												
1861	**General Statistics**											
1862					Number of Valid Data	16			Number of Detected Data	3		
1863					Number of Distinct Detected Data	3			Number of Non-Detect Data	13		
1864									Percent Non-Detects	81.25%		
1865												
1866	**Raw Statistics**						**Log-transformed Statistics**					
1867					Minimum Detected	10.16			Minimum Detected	2.319		
1868					Maximum Detected	14.41			Maximum Detected	2.668		
1869					Mean of Detected	11.65			Mean of Detected	2.442		
1870					SD of Detected	2.388			SD of Detected	0.196		
1871					Minimum Non-Detect	0.5			Minimum Non-Detect	-0.693		
1872					Maximum Non-Detect	200			Maximum Non-Detect	5.298		
1873												
1874	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	16		
1875	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	0		
1876	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	100.00%		
1877												
1878	**Warning: There are only 3 Distinct Detected Values in this data set**											
1879	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1880	**Those methods will return a 'N/A' value on your output display!**											
1881												
1882	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1883	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1884												
1885												
1886	**UCL Statistics**											
1887	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1888					Shapiro Wilk Test Statistic	0.79			Shapiro Wilk Test Statistic	0.797		
1889					5% Shapiro Wilk Critical Value	0.767			5% Shapiro Wilk Critical Value	0.767		
1890	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1891												
1892	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1893					DL/2 Substitution Method				DL/2 Substitution Method			
1894					Mean	9.56			Mean	0.715		
1895					SD	24.5			SD	1.693		
1896					95% DL/2 (t) UCL	20.3			95% H-Stat (DL/2) UCL	19.12		
1897												
1898					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
1899	**MLE method failed to converge properly**								Mean in Log Scale	1.679		
1900									SD in Log Scale	0.427		
1901									Mean in Original Scale	5.908		
1902									SD in Original Scale	3.091		
1903									95% Percentile Bootstrap UCL	7.202		
1904									95% BCA Bootstrap UCL	7.517		
1905												
1906	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1907					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
1908					Theta Star	N/A						

1909					nu star	N/A						
1910												
1911					A-D Test Statistic	0.549	**Nonparametric Statistics**					
1912					5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method		
1913					K-S Test Statistic	N/A				Mean		10.46
1914					5% K-S Critical Value	N/A				SD		1.056
1915			**Data not Gamma Distributed at 5% Significance Level**							SE of Mean		0.334
1916										95% KM (t) UCL		11.04
1917			**Assuming Gamma Distribution**							95% KM (z) UCL		11.01
1918			Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL		10.89
1919					Minimum	N/A				95% KM (bootstrap t) UCL		14.98
1920					Maximum	N/A				95% KM (BCA) UCL		N/A
1921					Mean	N/A				95% KM (Percentile Bootstrap) UCL		14.41
1922					Median	N/A				95% KM (Chebyshev) UCL		11.92
1923					SD	N/A				97.5% KM (Chebyshev) UCL		12.55
1924					k star	N/A				99% KM (Chebyshev) UCL		13.78
1925					Theta star	N/A						
1926					Nu star	N/A	**Potential UCLs to Use**					
1927					AppChi2	N/A				95% KM (t) UCL		11.04
1928					95% Gamma Approximate UCL	N/A				95% KM (Percentile Bootstrap) UCL		14.41
1929					95% Adjusted Gamma UCL	N/A						
1930	**Note: DL/2 is not a recommended method.**											
1931												
1932												
1933	**Nitrate as Nitrogen (mw-30-50)**											
1934												
1935					**General Statistics**							
1936					Number of Valid Data	12				Number of Detected Data		5
1937					Number of Distinct Detected Data	5				Number of Non-Detect Data		7
1938										Percent Non-Detects		58.33%
1939												
1940			**Raw Statistics**				**Log-transformed Statistics**					
1941					Minimum Detected	0.28				Minimum Detected		-1.273
1942					Maximum Detected	3.7				Maximum Detected		1.308
1943					Mean of Detected	2.064				Mean of Detected		0.393
1944					SD of Detected	1.487				SD of Detected		1.05
1945					Minimum Non-Detect	0.5				Minimum Non-Detect		-0.693
1946					Maximum Non-Detect	0.5				Maximum Non-Detect		-0.693
1947												
1948												
1949	**Warning: There are only 5 Detected Values in this data**											
1950	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1951	**the resulting calculations may not be reliable enough tp draw conclusions**											
1952												
1953	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1954												
1955												
1956	**UCL Statistics**											
1957	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1958					Shapiro Wilk Test Statistic	0.904				Shapiro Wilk Test Statistic		0.884
1959					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
1960	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1961												

1962	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1963				DL/2 Substitution Method						DL/2 Substitution Method		
1964				Mean	1.006					Mean	-0.645	
1965				SD	1.295					SD	1.114	
1966				95% DL/2 (t) UCL	1.677					95% H-Stat (DL/2) UCL	2.262	
1967												
1968				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
1969				Mean	2.605					Mean in Log Scale	-0.621	
1970				SD	1.103					SD in Log Scale	1.243	
1971				95% MLE (t) UCL	3.177					Mean in Original Scale	1.053	
1972				95% MLE (Tiku) UCL	3.583					SD in Original Scale	1.276	
1973										95% Percentile Bootstrap UCL	1.66	
1974										95% BCA Bootstrap UCL	1.805	
1975												
1976	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1977				k star (bias corrected)	0.795		**Data appear Normal at 5% Significance Level**					
1978				Theta Star	2.595							
1979				nu star	7.953							
1980												
1981				A-D Test Statistic	0.324		**Nonparametric Statistics**					
1982				5% A-D Critical Value	0.686					Kaplan-Meier (KM) Method		
1983				K-S Test Statistic	0.686					Mean	1.023	
1984				5% K-S Critical Value	0.361					SD	1.229	
1985	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.397	
1986										95% KM (t) UCL	1.736	
1987	**Assuming Gamma Distribution**									95% KM (z) UCL	1.676	
1988				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.754	
1989				Minimum	0.28					95% KM (bootstrap t) UCL	1.86	
1990				Maximum	3.7					95% KM (BCA) UCL	3.5	
1991				Mean	2.288					95% KM (Percentile Bootstrap) UCL	2.228	
1992				Median	2.253					95% KM (Chebyshev) UCL	2.753	
1993				SD	1.043					97.5% KM (Chebyshev) UCL	3.501	
1994				k star	2.505					99% KM (Chebyshev) UCL	4.971	
1995				Theta star	0.914							
1996				Nu star	60.12		**Potential UCLs to Use**					
1997				AppChi2	43.29					95% KM (t) UCL	1.736	
1998				95% Gamma Approximate UCL	3.178					95% KM (Percentile Bootstrap) UCL	2.228	
1999				95% Adjusted Gamma UCL	3.346							
2000	**Note: DL/2 is not a recommended method.**											
2001												
2002												
2003	**Nitrate as Nitrogen (mw-31-135)**											
2004												
2005	**General Statistics**											
2006				Number of Valid Observations	4					Number of Distinct Observations	4	
2007												
2008												
2009	**Warning: This data set only has 4 observations!**											
2010	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2011	**The data set for variable Nitrate as Nitrogen (mw-31-135) was not processed!**											
2012												
2013	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2014	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											

2015												
2016												
2017												
2018	**Nitrate as Nitrogen (mw-31-60)**											
2019												
2020						**General Statistics**						
2021					Number of Valid Observations	17			Number of Distinct Observations	17		
2022												
2023					**Raw Statistics**				**Log-transformed Statistics**			
2024					Minimum	1.784			Minimum of Log Data	0.579		
2025					Maximum	6.2			Maximum of Log Data	1.825		
2026					Mean	4.466			Mean of log Data	1.443		
2027					Median	4.93			SD of log Data	0.368		
2028					SD	1.281						
2029					Coefficient of Variation	0.287						
2030					Skewness	-1.052						
2031												
2032					**Relevant UCL Statistics**							
2033					**Normal Distribution Test**				**Lognormal Distribution Test**			
2034					Shapiro Wilk Test Statistic	0.889			Shapiro Wilk Test Statistic	0.787		
2035					Shapiro Wilk Critical Value	0.892			Shapiro Wilk Critical Value	0.892		
2036					**Data not Normal at 5% Significance Level**				**Data not Lognormal at 5% Significance Level**			
2037												
2038					**Assuming Normal Distribution**				**Assuming Lognormal Distribution**			
2039					95% Student's-t UCL	5.008			95% H-UCL	5.402		
2040					**95% UCLs (Adjusted for Skewness)**				95% Chebyshev (MVUE) UCL	6.298		
2041					95% Adjusted-CLT UCL	4.892			97.5% Chebyshev (MVUE) UCL	7.071		
2042					95% Modified-t UCL	4.995			99% Chebyshev (MVUE) UCL	8.591		
2043												
2044					**Gamma Distribution Test**				**Data Distribution**			
2045					k star (bias corrected)	7.858			**Data do not follow a Discernable Distribution (0.05)**			
2046					Theta Star	0.568						
2047					nu star	267.2						
2048					Approximate Chi Square Value (.05)	230.3			**Nonparametric Statistics**			
2049					Adjusted Level of Significance	0.0346			95% CLT UCL	4.977		
2050					Adjusted Chi Square Value	226.7			95% Jackknife UCL	5.008		
2051									95% Standard Bootstrap UCL	4.961		
2052					Anderson-Darling Test Statistic	1.228			95% Bootstrap-t UCL	4.935		
2053					Anderson-Darling 5% Critical Value	0.739			95% Hall's Bootstrap UCL	4.891		
2054					Kolmogorov-Smirnov Test Statistic	0.238			95% Percentile Bootstrap UCL	4.925		
2055					Kolmogorov-Smirnov 5% Critical Value	0.209			95% BCA Bootstrap UCL	4.889		
2056					**Data not Gamma Distributed at 5% Significance Level**				95% Chebyshev(Mean, Sd) UCL	5.82		
2057									97.5% Chebyshev(Mean, Sd) UCL	6.406		
2058					**Assuming Gamma Distribution**				99% Chebyshev(Mean, Sd) UCL	7.558		
2059					95% Approximate Gamma UCL	5.18						
2060					95% Adjusted Gamma UCL	5.262						
2061												
2062					**Potential UCL to Use**				Use 95% Student's-t UCL	5.008		
2063									or 95% Modified-t UCL	4.995		
2064												
2065												
2066	**Nitrate as Nitrogen (mw-32-20)**											
2067												

	A	B	C	D	E	F	G	H	I	J	K	L
2068	**General Statistics**											
2069					Number of Valid Data	17				Number of Detected Data		1
2070					Number of Distinct Detected Data	1				Number of Non-Detect Data		16
2071										Percent Non-Detects		94.12%
2072												
2073	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
2074	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
2075												
2076	**The data set for variable Nitrate as Nitrogen (mw-32-20) was not processed!**											
2077												
2078												
2079												
2080	**Nitrate as Nitrogen (mw-32-35)**											
2081												
2082	**General Statistics**											
2083					Number of Valid Data	17				Number of Detected Data		0
2084					Number of Distinct Detected Data	0				Number of Non-Detect Data		17
2085										Percent Non-Detects		100.00%
2086												
2087	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2088	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
2089	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2090												
2091	**The data set for variable Nitrate as Nitrogen (mw-32-35) was not processed!**											
2092												
2093												
2094												
2095	**Nitrate as Nitrogen (mw-33-150)**											
2096												
2097	**General Statistics**											
2098					Number of Valid Data	5				Number of Detected Data		4
2099					Number of Distinct Detected Data	4				Number of Non-Detect Data		1
2100										Percent Non-Detects		20.00%
2101												
2102	**Raw Statistics**						**Log-transformed Statistics**					
2103					Minimum Detected	0.992				Minimum Detected		-0.00803
2104					Maximum Detected	1.41				Maximum Detected		0.344
2105					Mean of Detected	1.121				Mean of Detected		0.103
2106					SD of Detected	0.194				SD of Detected		0.162
2107					Minimum Non-Detect	1				Minimum Non-Detect		0
2108					Maximum Non-Detect	1				Maximum Non-Detect		0
2109												
2110												
2111	**Warning: There are only 4 Distinct Detected Values in this data**											
2112	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2113	**the resulting calculations may not be reliable enough tp draw conclusions**											
2114												
2115	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2116												
2117												
2118	**UCL Statistics**											
2119	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2120					Shapiro Wilk Test Statistic	0.744				Shapiro Wilk Test Statistic		0.763

2121				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
2122	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2123												
2124	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2125				DL/2 Substitution Method						DL/2 Substitution Method		
2126				Mean	0.996					Mean	-0.0558	
2127				SD	0.325					SD	0.383	
2128				95% DL/2 (t) UCL	1.306					95% H-Stat (DL/2) UCL	1.675	
2129												
2130				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
2131				Mean	1.029					Mean in Log Scale	0.0696	
2132				SD	0.229					SD in Log Scale	0.159	
2133				95% MLE (t) UCL	1.247					Mean in Original Scale	1.084	
2134				95% MLE (Tiku) UCL	1.274					SD in Original Scale	0.188	
2135										95% Percentile Bootstrap UCL	1.232	
2136										95% BCA Bootstrap UCL	1.254	
2137												
2138	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2139				k star (bias corrected)	12.35		**Data appear Lognormal at 5% Significance Level**					
2140				Theta Star	0.0908							
2141				nu star	98.77							
2142												
2143				A-D Test Statistic	0.672		**Nonparametric Statistics**					
2144				5% A-D Critical Value	0.656					Kaplan-Meier (KM) Method		
2145				K-S Test Statistic	0.656					Mean	1.095	
2146				5% K-S Critical Value	0.394					SD	0.159	
2147	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0822	
2148										95% KM (t) UCL	1.27	
2149	**Assuming Gamma Distribution**									95% KM (z) UCL	1.23	
2150				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.263	
2151				Minimum	0.992					95% KM (bootstrap t) UCL	1.981	
2152				Maximum	1.41					95% KM (BCA) UCL	1.254	
2153				Mean	1.095					95% KM (Percentile Bootstrap) UCL	1.258	
2154				Median	1.03					95% KM (Chebyshev) UCL	1.453	
2155				SD	0.178					97.5% KM (Chebyshev) UCL	1.608	
2156				k star	21.48					99% KM (Chebyshev) UCL	1.913	
2157				Theta star	0.051							
2158				Nu star	214.8		**Potential UCLs to Use**					
2159				AppChi2	181.9					95% KM (BCA) UCL	1.254	
2160				95% Gamma Approximate UCL	1.293							
2161				95% Adjusted Gamma UCL	N/A							
2162	**Note: DL/2 is not a recommended method.**											
2163												
2164												
2165	**Nitrate as Nitrogen (mw-33-210)**											
2166												
2167	**General Statistics**											
2168				Number of Valid Observations	5					Number of Distinct Observations	5	
2169												
2170	**Raw Statistics**						**Log-transformed Statistics**					
2171				Minimum	1.05					Minimum of Log Data	0.0488	
2172				Maximum	1.86					Maximum of Log Data	0.621	
2173				Mean	1.286					Mean of log Data	0.228	

2174					Median	1.19					SD of log Data	0.232
2175					SD	0.332						
2176					Coefficient of Variation	0.258						
2177					Skewness	1.873						
2178												
2179												
2180	**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
2181												
2182	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
2183	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2184												
2185												
2186	**Warning: There are only 5 Values in this data**											
2187	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
2188	**the resulting calculations may not be reliable enough to draw conclusions**											
2189												
2190	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
2191												
2192	**Relevant UCL Statistics**											
2193	**Normal Distribution Test**						**Lognormal Distribution Test**					
2194					Shapiro Wilk Test Statistic	0.773					Shapiro Wilk Test Statistic	0.819
2195					Shapiro Wilk Critical Value	0.762					Shapiro Wilk Critical Value	0.762
2196	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2197												
2198	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2199					95% Student's-t UCL	1.603					95% H-UCL	1.677
2200	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	1.863
2201					95% Adjusted-CLT UCL	1.663					97.5% Chebyshev (MVUE) UCL	2.113
2202					95% Modified-t UCL	1.624					99% Chebyshev (MVUE) UCL	2.605
2203												
2204	**Gamma Distribution Test**						**Data Distribution**					
2205					k star (bias corrected)	8.851	**Data appear Normal at 5% Significance Level**					
2206					Theta Star	0.145						
2207					nu star	88.51						
2208					Approximate Chi Square Value (.05)	67.82	**Nonparametric Statistics**					
2209					Adjusted Level of Significance	0.0086					95% CLT UCL	1.53
2210					Adjusted Chi Square Value	59.94					95% Jackknife UCL	1.603
2211											95% Standard Bootstrap UCL	1.501
2212					Anderson-Darling Test Statistic	0.58					95% Bootstrap-t UCL	2.104
2213					Anderson-Darling 5% Critical Value	0.679					95% Hall's Bootstrap UCL	2.551
2214					Kolmogorov-Smirnov Test Statistic	0.309					95% Percentile Bootstrap UCL	1.54
2215					Kolmogorov-Smirnov 5% Critical Value	0.357					95% BCA Bootstrap UCL	1.592
2216	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	1.934
2217											97.5% Chebyshev(Mean, Sd) UCL	2.214
2218	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	2.765
2219					95% Approximate Gamma UCL	1.678						
2220					95% Adjusted Gamma UCL	1.899						
2221												
2222	**Potential UCL to Use**										Use 95% Student's-t UCL	1.603
2223												
2224												
2225	**Nitrate as Nitrogen (mw-33-40)**											
2226												

	A	B	C	D	E	F	G	H	I	J	K	L
2227	**General Statistics**											
2228					Number of Valid Data	5				Number of Detected Data		2
2229					Number of Distinct Detected Data	2				Number of Non-Detect Data		3
2230										Percent Non-Detects		60.00%
2231												
2232	**Raw Statistics**						**Log-transformed Statistics**					
2233					Minimum Detected	0.21				Minimum Detected		-1.561
2234					Maximum Detected	0.57				Maximum Detected		-0.562
2235					Mean of Detected	0.39				Mean of Detected		-1.061
2236					SD of Detected	0.255				SD of Detected		0.706
2237					Minimum Non-Detect	0.4				Minimum Non-Detect		-0.916
2238					Maximum Non-Detect	0.5				Maximum Non-Detect		-0.693
2239												
2240	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		4
2241	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
2242	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		80.00%
2243												
2244	**Warning: Data set has only 2 Distinct Detected Values.**											
2245	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
2246	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2247												
2248	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
2249												
2250	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2251	**Those methods will return a 'N/A' value on your output display!**											
2252												
2253	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2254	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2255												
2256												
2257	**UCL Statistics**											
2258	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2259					Shapiro Wilk Test Statistic	1				Shapiro Wilk Test Statistic		1
2260					5% Shapiro Wilk Critical Value	N/A				5% Shapiro Wilk Critical Value		N/A
2261	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2262												
2263	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2264					DL/2 Substitution Method					DL/2 Substitution Method		
2265					Mean	0.296				Mean		-1.301
2266					SD	0.155				SD		0.425
2267					95% DL/2 (t) UCL	0.444				95% H-Stat (DL/2) UCL		1.224
2268												
2269					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
2270	**MLE method failed to converge properly**									Mean in Log Scale		N/A
2271										SD in Log Scale		N/A
2272										Mean in Original Scale		N/A
2273										SD in Original Scale		N/A
2274										95% Percentile Bootstrap UCL		N/A
2275										95% BCA Bootstrap UCL		N/A
2276												
2277	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2278					k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**					
2279					Theta Star	N/A						

2280					nu star	N/A						
2281												
2282					A-D Test Statistic	0.359	**Nonparametric Statistics**					
2283					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
2284					K-S Test Statistic	N/A					Mean	0.282
2285					5% K-S Critical Value	N/A					SD	0.144
2286			**Data not Gamma Distributed at 5% Significance Level**								SE of Mean	0.0911
2287											95% KM (t) UCL	0.476
2288			**Assuming Gamma Distribution**								95% KM (z) UCL	0.432
2289			Gamma ROS Statistics using Extrapolated Data								95% KM (jackknife) UCL	0.587
2290					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
2291					Maximum	N/A					95% KM (BCA) UCL	0.57
2292					Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
2293					Median	N/A					95% KM (Chebyshev) UCL	0.679
2294					SD	N/A					97.5% KM (Chebyshev) UCL	0.851
2295					k star	N/A					99% KM (Chebyshev) UCL	1.188
2296					Theta star	N/A						
2297					Nu star	N/A	**Potential UCLs to Use**					
2298					AppChi2	N/A					95% KM (t) UCL	0.476
2299					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A
2300					95% Adjusted Gamma UCL	N/A						
2301	**Note: DL/2 is not a recommended method.**											
2302												
2303												
2304	**Nitrate as Nitrogen (mw-33-90)**											
2305												
2306						**General Statistics**						
2307					Number of Valid Data	6	Number of Detected Data	5				
2308					Number of Distinct Detected Data	5	Number of Non-Detect Data	1				
2309							Percent Non-Detects	16.67%				
2310												
2311			**Raw Statistics**				**Log-transformed Statistics**					
2312					Minimum Detected	0.975	Minimum Detected	-0.0253				
2313					Maximum Detected	1.1	Maximum Detected	0.0953				
2314					Mean of Detected	1.041	Mean of Detected	0.0391				
2315					SD of Detected	0.0546	SD of Detected	0.0526				
2316					Minimum Non-Detect	0.2	Minimum Non-Detect	-1.609				
2317					Maximum Non-Detect	0.2	Maximum Non-Detect	-1.609				
2318												
2319												
2320	**Warning: There are only 5 Detected Values in this data**											
2321	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2322	**the resulting calculations may not be reliable enough tp draw conclusions**											
2323												
2324	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2325												
2326												
2327						**UCL Statistics**							
2328			**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**					
2329					Shapiro Wilk Test Statistic	0.921	Shapiro Wilk Test Statistic	0.922				
2330					5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762				
2331			**Data appear Normal at 5% Significance Level**				**Data appear Lognormal at 5% Significance Level**					
2332												

2333	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2334				DL/2 Substitution Method						DL/2 Substitution Method		
2335				Mean		0.884				Mean		-0.351
2336				SD		0.387				SD		0.957
2337				95% DL/2 (t) UCL		1.203				95% H-Stat (DL/2) UCL		2.27
2338												
2339				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
2340				Mean		0.876				Mean in Log Scale		0.0167
2341				SD		0.376				SD in Log Scale		0.0722
2342				95% MLE (t) UCL		1.185				Mean in Original Scale		1.019
2343				95% MLE (Tiku) UCL		1.209				SD in Original Scale		0.0727
2344										95% Percentile Bootstrap UCL		1.061
2345										95% BCA Bootstrap UCL		1.061
2346												
2347	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2348				k star (bias corrected)		181.4	**Data appear Normal at 5% Significance Level**					
2349				Theta Star		0.00574						
2350				nu star		1814						
2351												
2352				A-D Test Statistic		0.314	**Nonparametric Statistics**					
2353				5% A-D Critical Value		0.678				Kaplan-Meier (KM) Method		
2354				K-S Test Statistic		0.678				Mean		1.03
2355				5% K-S Critical Value		0.357				SD		0.0509
2356	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.0232
2357										95% KM (t) UCL		1.077
2358	**Assuming Gamma Distribution**									95% KM (z) UCL		1.068
2359				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1.076
2360				Minimum		0.96				95% KM (bootstrap t) UCL		1.079
2361				Maximum		1.1				95% KM (BCA) UCL		1.07
2362				Mean		1.027				95% KM (Percentile Bootstrap) UCL		1.072
2363				Median		1.02				95% KM (Chebyshev) UCL		1.131
2364				SD		0.059				97.5% KM (Chebyshev) UCL		1.175
2365				k star		182.7				99% KM (Chebyshev) UCL		1.261
2366				Theta star		0.00562						
2367				Nu star		2192	**Potential UCLs to Use**					
2368				AppChi2		2084				95% KM (t) UCL		1.077
2369				95% Gamma Approximate UCL		1.081				95% KM (Percentile Bootstrap) UCL		1.072
2370				95% Adjusted Gamma UCL		1.101						
2371	**Note: DL/2 is not a recommended method.**											
2372												
2373												
2374	**Nitrate as Nitrogen (mw-34-100)**											
2375												
2376	**General Statistics**											
2377				Number of Valid Data		8				Number of Detected Data		7
2378				Number of Distinct Detected Data		7				Number of Non-Detect Data		1
2379										Percent Non-Detects		12.50%
2380												
2381	**Raw Statistics**						**Log-transformed Statistics**					
2382				Minimum Detected		0.786				Minimum Detected		-0.241
2383				Maximum Detected		1.39				Maximum Detected		0.329
2384				Mean of Detected		1.192				Mean of Detected		0.16
2385				SD of Detected		0.217				SD of Detected		0.203

2386					Minimum Non-Detect	1					Minimum Non-Detect	0
2387					Maximum Non-Detect	1					Maximum Non-Detect	0
2388												
2389												
2390					Warning: There are only 7 Detected Values in this data							
2391					Note: It should be noted that even though bootstrap may be performed on this data set							
2392					the resulting calculations may not be reliable enough tp draw conclusions							
2393												
2394					It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.							
2395												
2396												
2397					UCL Statistics							
2398					Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only	
2399					Shapiro Wilk Test Statistic	0.878					Shapiro Wilk Test Statistic	0.839
2400					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
2401					Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	
2402												
2403					Assuming Normal Distribution						Assuming Lognormal Distribution	
2404					DL/2 Substitution Method						DL/2 Substitution Method	
2405					Mean	1.106					Mean	0.0529
2406					SD	0.316					SD	0.355
2407					95% DL/2 (t) UCL	1.318					95% H-Stat (DL/2) UCL	1.467
2408												
2409					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2410					Mean	1.168					Mean in Log Scale	0.12
2411					SD	0.197					SD in Log Scale	0.219
2412					95% MLE (t) UCL	1.3					Mean in Original Scale	1.15
2413					95% MLE (Tiku) UCL	1.308					SD in Original Scale	0.234
2414											95% Percentile Bootstrap UCL	1.273
2415											95% BCA Bootstrap UCL	1.259
2416												
2417					Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only	
2418					k star (bias corrected)	17.66					Data appear Normal at 5% Significance Level	
2419					Theta Star	0.0675						
2420					nu star	247.2						
2421												
2422					A-D Test Statistic	0.499					Nonparametric Statistics	
2423					5% A-D Critical Value	0.707					Kaplan-Meier (KM) Method	
2424					K-S Test Statistic	0.707					Mean	1.142
2425					5% K-S Critical Value	0.311					SD	0.231
2426					Data appear Gamma Distributed at 5% Significance Level						SE of Mean	0.0881
2427											95% KM (t) UCL	1.308
2428					Assuming Gamma Distribution						95% KM (z) UCL	1.286
2429					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.316
2430					Minimum	0.786					95% KM (bootstrap t) UCL	1.283
2431					Maximum	1.39					95% KM (BCA) UCL	1.311
2432					Mean	1.158					95% KM (Percentile Bootstrap) UCL	1.294
2433					Median	1.2					95% KM (Chebyshev) UCL	1.526
2434					SD	0.222					97.5% KM (Chebyshev) UCL	1.692
2435					k star	17.81					99% KM (Chebyshev) UCL	2.019
2436					Theta star	0.065						
2437					Nu star	284.9					Potential UCLs to Use	
2438					AppChi2	246.8					95% KM (t) UCL	1.308

2439				95% Gamma Approximate UCL		1.337				95% KM (Percentile Bootstrap) UCL		1.294
2440				95% Adjusted Gamma UCL		1.388						
2441	**Note: DL/2 is not a recommended method.**											
2442												
2443												
2444	**Nitrate as Nitrogen (mw-34-55)**											
2445												
2446	**General Statistics**											
2447				Number of Valid Data		14				Number of Detected Data		0
2448				Number of Distinct Detected Data		0				Number of Non-Detect Data		14
2449										Percent Non-Detects		100.00%
2450												
2451	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2452	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
2453	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2454												
2455	**The data set for variable Nitrate as Nitrogen (mw-34-55) was not processed!**											
2456												
2457												
2458												
2459	**Nitrate as Nitrogen (mw-34-80)**											
2460												
2461	**General Statistics**											
2462				Number of Valid Data		17				Number of Detected Data		0
2463				Number of Distinct Detected Data		0				Number of Non-Detect Data		17
2464										Percent Non-Detects		100.00%
2465												
2466	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2467	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
2468	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2469												
2470	**The data set for variable Nitrate as Nitrogen (mw-34-80) was not processed!**											
2471												
2472												
2473												
2474	**Nitrate as Nitrogen (mw-35-135)**											
2475												
2476	**General Statistics**											
2477				Number of Valid Observations		5				Number of Distinct Observations		5
2478												
2479	**Raw Statistics**									**Log-transformed Statistics**		
2480				Minimum		2				Minimum of Log Data		0.693
2481				Maximum		2.46				Maximum of Log Data		0.9
2482				Mean		2.258				Mean of log Data		0.812
2483				Median		2.25				SD of log Data		0.0809
2484				SD		0.18						
2485				Coefficient of Variation		0.0797						
2486				Skewness		-0.497						
2487												
2488												
2489	**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
2490												
2491	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											

	A	B	C	D	E	F	G	H	I	J	K	L
2492	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2493												
2494												
2495	**Warning: There are only 5 Values in this data**											
2496	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
2497	**the resulting calculations may not be reliable enough to draw conclusions**											
2498												
2499	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
2500												
2501	**Relevant UCL Statistics**											
2502	**Normal Distribution Test**						**Lognormal Distribution Test**					
2503					Shapiro Wilk Test Statistic	0.968				Shapiro Wilk Test Statistic	0.961	
2504					Shapiro Wilk Critical Value	0.762				Shapiro Wilk Critical Value	0.762	
2505	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2506												
2507	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2508					95% Student's-t UCL	2.43				95% H-UCL	N/A	
2509	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	2.614	
2510					95% Adjusted-CLT UCL	2.371				97.5% Chebyshev (MVUE) UCL	2.768	
2511					95% Modified-t UCL	2.427				99% Chebyshev (MVUE) UCL	3.071	
2512												
2513	**Gamma Distribution Test**						**Data Distribution**					
2514					k star (bias corrected)	77.34	**Data appear Normal at 5% Significance Level**					
2515					Theta Star	0.0292						
2516					nu star	773.4						
2517					Approximate Chi Square Value (.05)	709.9	**Nonparametric Statistics**					
2518					Adjusted Level of Significance	0.0086				95% CLT UCL	2.39	
2519					Adjusted Chi Square Value	682.8				95% Jackknife UCL	2.43	
2520										95% Standard Bootstrap UCL	2.377	
2521					Anderson-Darling Test Statistic	0.228				95% Bootstrap-t UCL	2.426	
2522					Anderson-Darling 5% Critical Value	0.678				95% Hall's Bootstrap UCL	2.424	
2523					Kolmogorov-Smirnov Test Statistic	0.194				95% Percentile Bootstrap UCL	2.376	
2524					Kolmogorov-Smirnov 5% Critical Value	0.357				95% BCA Bootstrap UCL	2.354	
2525	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	2.609	
2526										97.5% Chebyshev(Mean, Sd) UCL	2.76	
2527	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	3.059	
2528					95% Approximate Gamma UCL	2.46						
2529					95% Adjusted Gamma UCL	2.558						
2530												
2531	**Potential UCL to Use**									Use 95% Student's-t UCL	2.43	
2532												
2533												
2534	**Nitrate as Nitrogen (mw-35-60)**											
2535												
2536	**General Statistics**											
2537					Number of Valid Observations	4				Number of Distinct Observations	3	
2538												
2539												
2540	**Warning: This data set only has 4 observations!**											
2541	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2542	**The data set for variable Nitrate as Nitrogen (mw-35-60) was not processed!**											
2543												
2544	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											

	A	B	C	D	E	F	G	H	I	J	K	L
2545	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2546												
2547												
2548												
2549	Nitrate as Nitrogen (mw-36-100)											
2550												
2551	General Statistics											
2552					Number of Valid Data	4			Number of Detected Data	2		
2553					Number of Distinct Detected Data	2			Number of Non-Detect Data	2		
2554									Percent Non-Detects	50.00%		
2555												
2556	Warning: This data set only has 4 observations!											
2557	Data set is too small to compute reliable and meaningful statistics and estimates!											
2558	The data set for variable Nitrate as Nitrogen (mw-36-100) was not processed!											
2559												
2560	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2561	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2562												
2563												
2564												
2565	Nitrate as Nitrogen (mw-36-20)											
2566												
2567	General Statistics											
2568					Number of Valid Data	4			Number of Detected Data	0		
2569					Number of Distinct Detected Data	0			Number of Non-Detect Data	4		
2570									Percent Non-Detects	100.00%		
2571												
2572	Warning: This data set only has 4 observations!											
2573	Data set is too small to compute reliable and meaningful statistics and estimates!											
2574	The data set for variable Nitrate as Nitrogen (mw-36-20) was not processed!											
2575												
2576	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2577	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2578												
2579												
2580												
2581	Nitrate as Nitrogen (mw-36-40)											
2582												
2583	General Statistics											
2584					Number of Valid Data	2			Number of Detected Data	0		
2585					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
2586									Percent Non-Detects	100.00%		
2587												
2588	Warning: This data set only has 2 observations!											
2589	Data set is too small to compute reliable and meaningful statistics and estimates!											
2590	The data set for variable Nitrate as Nitrogen (mw-36-40) was not processed!											
2591												
2592	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2593	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2594												
2595												
2596												
2597	Nitrate as Nitrogen (mw-36-50)											

2598												
2599						General Statistics						
2600						Number of Valid Data	4			Number of Detected Data	0	
2601						Number of Distinct Detected Data	0			Number of Non-Detect Data	4	
2602										Percent Non-Detects	100.00%	
2603												
2604						Warning: This data set only has 4 observations!						
2605						Data set is too small to compute reliable and meaningful statistics and estimates!						
2606						The data set for variable Nitrate as Nitrogen (mw-36-50) was not processed!						
2607												
2608						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
2609						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
2610												
2611												
2612												
2613	Nitrate as Nitrogen (mw-36-70)											
2614												
2615						General Statistics						
2616						Number of Valid Data	4			Number of Detected Data	0	
2617						Number of Distinct Detected Data	0			Number of Non-Detect Data	4	
2618										Percent Non-Detects	100.00%	
2619												
2620						Warning: This data set only has 4 observations!						
2621						Data set is too small to compute reliable and meaningful statistics and estimates!						
2622						The data set for variable Nitrate as Nitrogen (mw-36-70) was not processed!						
2623												
2624						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
2625						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
2626												
2627												
2628												
2629	Nitrate as Nitrogen (mw-36-90)											
2630												
2631						General Statistics						
2632						Number of Valid Data	3			Number of Detected Data	1	
2633						Number of Distinct Detected Data	1			Number of Non-Detect Data	2	
2634										Percent Non-Detects	66.67%	
2635												
2636						Warning: This data set only has 3 observations!						
2637						Data set is too small to compute reliable and meaningful statistics and estimates!						
2638						The data set for variable Nitrate as Nitrogen (mw-36-90) was not processed!						
2639												
2640						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
2641						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
2642												
2643												
2644												
2645	Nitrate as Nitrogen (mw-37d)											
2646												
2647						General Statistics						
2648						Number of Valid Observations	3			Number of Distinct Observations	3	
2649												
2650												

	A	B	C	D	E	F	G	H	I	J	K	L
2651	Warning: This data set only has 3 observations!											
2652	Data set is too small to compute reliable and meaningful statistics and estimates!											
2653	The data set for variable Nitrate as Nitrogen (mw-37d) was not processed!											
2654												
2655	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2656	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2657												
2658												
2659												
2660	Nitrate as Nitrogen (mw-37s)											
2661												
2662	General Statistics											
2663	Number of Valid Observations	3			Number of Distinct Observations	3						
2664												
2665												
2666	Warning: This data set only has 3 observations!											
2667	Data set is too small to compute reliable and meaningful statistics and estimates!											
2668	The data set for variable Nitrate as Nitrogen (mw-37s) was not processed!											
2669												
2670	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2671	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2672												
2673												
2674												
2675	Nitrate as Nitrogen (mw-38d)											
2676												
2677	General Statistics											
2678	Number of Valid Observations	4			Number of Distinct Observations	4						
2679												
2680												
2681	Warning: This data set only has 4 observations!											
2682	Data set is too small to compute reliable and meaningful statistics and estimates!											
2683	The data set for variable Nitrate as Nitrogen (mw-38d) was not processed!											
2684												
2685	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2686	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2687												
2688												
2689												
2690	Nitrate as Nitrogen (mw-38s)											
2691												
2692	General Statistics											
2693	Number of Valid Observations	4			Number of Distinct Observations	4						
2694												
2695												
2696	Warning: This data set only has 4 observations!											
2697	Data set is too small to compute reliable and meaningful statistics and estimates!											
2698	The data set for variable Nitrate as Nitrogen (mw-38s) was not processed!											
2699												
2700	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2701	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2702												
2703												

	A	B	C	D	E	F	G	H	I	J	K	L
2704												
2705	**Nitrate as Nitrogen (mw-39-100)**											
2706												
2707	**General Statistics**											
2708					Number of Valid Data	4			Number of Detected Data			3
2709					Number of Distinct Detected Data	3			Number of Non-Detect Data			1
2710									Percent Non-Detects			25.00%
2711												
2712	**Warning: This data set only has 4 observations!**											
2713	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2714	**The data set for variable Nitrate as Nitrogen (mw-39-100) was not processed!**											
2715												
2716	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2717	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2718												
2719												
2720												
2721	**Nitrate as Nitrogen (mw-39-40)**											
2722												
2723	**General Statistics**											
2724					Number of Valid Data	5			Number of Detected Data			0
2725					Number of Distinct Detected Data	0			Number of Non-Detect Data			5
2726									Percent Non-Detects			100.00%
2727												
2728	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
2729	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
2730	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2731												
2732	**The data set for variable Nitrate as Nitrogen (mw-39-40) was not processed!**											
2733												
2734												
2735												
2736	**Nitrate as Nitrogen (mw-39-50)**											
2737												
2738	**General Statistics**											
2739					Number of Valid Data	3			Number of Detected Data			1
2740					Number of Distinct Detected Data	1			Number of Non-Detect Data			2
2741									Percent Non-Detects			66.67%
2742												
2743	**Warning: This data set only has 3 observations!**											
2744	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2745	**The data set for variable Nitrate as Nitrogen (mw-39-50) was not processed!**											
2746												
2747	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2748	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2749												
2750												
2751												
2752	**Nitrate as Nitrogen (mw-39-60)**											
2753												
2754	**General Statistics**											
2755					Number of Valid Data	4			Number of Detected Data			1
2756					Number of Distinct Detected Data	1			Number of Non-Detect Data			3

2757											Percent Non-Detects	75.00%
2758												
2759	Warning: This data set only has 4 observations!											
2760	Data set is too small to compute reliable and meaningful statistics and estimates!											
2761	The data set for variable Nitrate as Nitrogen (mw-39-60) was not processed!											
2762												
2763	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2764	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2765												
2766												
2767												
2768	Nitrate as Nitrogen (mw-39-70)											
2769												
2770	General Statistics											
2771						Number of Valid Data	4				Number of Detected Data	1
2772						Number of Distinct Detected Data	1				Number of Non-Detect Data	3
2773											Percent Non-Detects	75.00%
2774												
2775	Warning: This data set only has 4 observations!											
2776	Data set is too small to compute reliable and meaningful statistics and estimates!											
2777	The data set for variable Nitrate as Nitrogen (mw-39-70) was not processed!											
2778												
2779	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2780	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2781												
2782												
2783												
2784	Nitrate as Nitrogen (mw-39-80)											
2785												
2786	General Statistics											
2787						Number of Valid Data	4				Number of Detected Data	3
2788						Number of Distinct Detected Data	3				Number of Non-Detect Data	1
2789											Percent Non-Detects	25.00%
2790												
2791	Warning: This data set only has 4 observations!											
2792	Data set is too small to compute reliable and meaningful statistics and estimates!											
2793	The data set for variable Nitrate as Nitrogen (mw-39-80) was not processed!											
2794												
2795	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2796	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2797												
2798												
2799												
2800	Nitrate as Nitrogen (mw-4)											
2801												
2802	General Statistics											
2803						Number of Valid Observations	2				Number of Distinct Observations	2
2804												
2805												
2806	Warning: This data set only has 2 observations!											
2807	Data set is too small to compute reliable and meaningful statistics and estimates!											
2808	The data set for variable Nitrate as Nitrogen (mw-4) was not processed!											
2809												

	A	B	C	D	E	F	G	H	I	J	K	L
2810	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2811	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2812												
2813												
2814												
2815	Nitrate as Nitrogen (mw-40d)											
2816												
2817	General Statistics											
2818				Number of Valid Observations	3			Number of Distinct Observations	3			
2819												
2820												
2821	Warning: This data set only has 3 observations!											
2822	Data set is too small to compute reliable and meaningful statistics and estimates!											
2823	The data set for variable Nitrate as Nitrogen (mw-40d) was not processed!											
2824												
2825	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2826	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2827												
2828												
2829												
2830	Nitrate as Nitrogen (mw-40s)											
2831												
2832	General Statistics											
2833				Number of Valid Observations	3			Number of Distinct Observations	3			
2834												
2835												
2836	Warning: This data set only has 3 observations!											
2837	Data set is too small to compute reliable and meaningful statistics and estimates!											
2838	The data set for variable Nitrate as Nitrogen (mw-40s) was not processed!											
2839												
2840	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2841	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2842												
2843												
2844												
2845	Nitrate as Nitrogen (mw-41d)											
2846												
2847	General Statistics											
2848				Number of Valid Data	3			Number of Detected Data	0			
2849				Number of Distinct Detected Data	0			Number of Non-Detect Data	3			
2850								Percent Non-Detects	100.00%			
2851												
2852	Warning: This data set only has 3 observations!											
2853	Data set is too small to compute reliable and meaningful statistics and estimates!											
2854	The data set for variable Nitrate as Nitrogen (mw-41d) was not processed!											
2855												
2856	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2857	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2858												
2859												
2860												
2861	Nitrate as Nitrogen (mw-41m)											
2862												

2863	General Statistics											
2864				Number of Valid Observations	2				Number of Distinct Observations	2		
2865												
2866												
2867	Warning: This data set only has 2 observations!											
2868	Data set is too small to compute reliable and meaningful statistics and estimates!											
2869	The data set for variable Nitrate as Nitrogen (mw-41m) was not processed!											
2870												
2871	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2872	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2873												
2874												
2875												
2876	Nitrate as Nitrogen (mw-41s)											
2877												
2878	General Statistics											
2879				Number of Valid Observations	3				Number of Distinct Observations	3		
2880												
2881												
2882	Warning: This data set only has 3 observations!											
2883	Data set is too small to compute reliable and meaningful statistics and estimates!											
2884	The data set for variable Nitrate as Nitrogen (mw-41s) was not processed!											
2885												
2886	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2887	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2888												
2889												
2890												
2891	Nitrate as Nitrogen (mw-42-30)											
2892												
2893	General Statistics											
2894				Number of Valid Data	4				Number of Detected Data	0		
2895				Number of Distinct Detected Data	0				Number of Non-Detect Data	4		
2896									Percent Non-Detects	100.00%		
2897												
2898	Warning: This data set only has 4 observations!											
2899	Data set is too small to compute reliable and meaningful statistics and estimates!											
2900	The data set for variable Nitrate as Nitrogen (mw-42-30) was not processed!											
2901												
2902	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2903	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2904												
2905												
2906												
2907	Nitrate as Nitrogen (mw-42-55)											
2908												
2909	General Statistics											
2910				Number of Valid Data	4				Number of Detected Data	0		
2911				Number of Distinct Detected Data	0				Number of Non-Detect Data	4		
2912									Percent Non-Detects	100.00%		
2913												
2914	Warning: This data set only has 4 observations!											
2915	Data set is too small to compute reliable and meaningful statistics and estimates!											

	A	B	C	D	E	F	G	H	I	J	K	L
2916	The data set for variable Nitrate as Nitrogen (mw-42-55) was not processed!											
2917												
2918	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2919	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2920												
2921												
2922												
2923	Nitrate as Nitrogen (mw-42-65)											
2924												
2925	General Statistics											
2926					Number of Valid Data	4			Number of Detected Data	0		
2927					Number of Distinct Detected Data	0			Number of Non-Detect Data	4		
2928									Percent Non-Detects	100.00%		
2929												
2930	Warning: This data set only has 4 observations!											
2931	Data set is too small to compute reliable and meaningful statistics and estimates!											
2932	The data set for variable Nitrate as Nitrogen (mw-42-65) was not processed!											
2933												
2934	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2935	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2936												
2937												
2938												
2939	Nitrate as Nitrogen (mw-43-25)											
2940												
2941	General Statistics											
2942					Number of Valid Data	4			Number of Detected Data	0		
2943					Number of Distinct Detected Data	0			Number of Non-Detect Data	4		
2944									Percent Non-Detects	100.00%		
2945												
2946	Warning: This data set only has 4 observations!											
2947	Data set is too small to compute reliable and meaningful statistics and estimates!											
2948	The data set for variable Nitrate as Nitrogen (mw-43-25) was not processed!											
2949												
2950	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2951	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2952												
2953												
2954												
2955	Nitrate as Nitrogen (mw-43-75)											
2956												
2957	General Statistics											
2958					Number of Valid Data	4			Number of Detected Data	0		
2959					Number of Distinct Detected Data	0			Number of Non-Detect Data	4		
2960									Percent Non-Detects	100.00%		
2961												
2962	Warning: This data set only has 4 observations!											
2963	Data set is too small to compute reliable and meaningful statistics and estimates!											
2964	The data set for variable Nitrate as Nitrogen (mw-43-75) was not processed!											
2965												
2966	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2967	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2968												

	A	B	C	D	E	F	G	H	I	J	K	L
2969												
2970												
2971	**Nitrate as Nitrogen (mw-43-90)**											
2972												
2973	**General Statistics**											
2974					Number of Valid Data	4			Number of Detected Data			0
2975					Number of Distinct Detected Data	0			Number of Non-Detect Data			4
2976									Percent Non-Detects			100.00%
2977												
2978	**Warning: This data set only has 4 observations!**											
2979	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2980	**The data set for variable Nitrate as Nitrogen (mw-43-90) was not processed!**											
2981												
2982	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2983	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2984												
2985												
2986												
2987	**Nitrate as Nitrogen (mw-44-115)**											
2988												
2989	**General Statistics**											
2990					Number of Valid Observations	1			Number of Distinct Observations			1
2991												
2992												
2993	**Warning: This data set only has 1 observations!**											
2994	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2995	**The data set for variable Nitrate as Nitrogen (mw-44-115) was not processed!**											
2996												
2997	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2998	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2999												
3000												
3001												
3002	**Nitrate as Nitrogen (mw-44-125)**											
3003												
3004	**General Statistics**											
3005					Number of Valid Observations	2			Number of Distinct Observations			2
3006												
3007												
3008	**Warning: This data set only has 2 observations!**											
3009	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3010	**The data set for variable Nitrate as Nitrogen (mw-44-125) was not processed!**											
3011												
3012	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3013	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3014												
3015												
3016												
3017	**Nitrate as Nitrogen (mw-44-70)**											
3018												
3019	**General Statistics**											
3020					Number of Valid Data	1			Number of Detected Data			0
3021					Number of Distinct Detected Data	0			Number of Non-Detect Data			1

3022											Percent Non-Detects	100.00%
3023												
3024	Warning: This data set only has 1 observations!											
3025	Data set is too small to compute reliable and meaningful statistics and estimates!											
3026	The data set for variable Nitrate as Nitrogen (mw-44-70) was not processed!											
3027												
3028	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3029	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3030												
3031												
3032												
3033	Nitrate as Nitrogen (mw-45-095a)											
3034												
3035	General Statistics											
3036						Number of Valid Data	2				Number of Detected Data	1
3037						Number of Distinct Detected Data	1				Number of Non-Detect Data	1
3038											Percent Non-Detects	50.00%
3039												
3040	Warning: This data set only has 2 observations!											
3041	Data set is too small to compute reliable and meaningful statistics and estimates!											
3042	The data set for variable Nitrate as Nitrogen (mw-45-095a) was not processed!											
3043												
3044	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3045	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3046												
3047												
3048												
3049	Nitrate as Nitrogen (mw-46-175)											
3050												
3051	General Statistics											
3052						Number of Valid Data	2				Number of Detected Data	1
3053						Number of Distinct Detected Data	1				Number of Non-Detect Data	1
3054											Percent Non-Detects	50.00%
3055												
3056	Warning: This data set only has 2 observations!											
3057	Data set is too small to compute reliable and meaningful statistics and estimates!											
3058	The data set for variable Nitrate as Nitrogen (mw-46-175) was not processed!											
3059												
3060	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3061	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3062												
3063												
3064												
3065	Nitrate as Nitrogen (mw-46-205)											
3066												
3067	General Statistics											
3068						Number of Valid Observations	1				Number of Distinct Observations	1
3069												
3070												
3071	Warning: This data set only has 1 observations!											
3072	Data set is too small to compute reliable and meaningful statistics and estimates!											
3073	The data set for variable Nitrate as Nitrogen (mw-46-205) was not processed!											
3074												

	A	B	C	D	E	F	G	H	I	J	K	L
3075	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3076	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3077												
3078												
3079												
3080	Nitrate as Nitrogen (mw-47-115)											
3081												
3082	General Statistics											
3083					Number of Valid Observations	1			Number of Distinct Observations	1		
3084												
3085												
3086	Warning: This data set only has 1 observations!											
3087	Data set is too small to compute reliable and meaningful statistics and estimates!											
3088	The data set for variable Nitrate as Nitrogen (mw-47-115) was not processed!											
3089												
3090	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3091	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3092												
3093												
3094												
3095	Nitrate as Nitrogen (mw-47-55)											
3096												
3097	General Statistics											
3098					Number of Valid Observations	2			Number of Distinct Observations	2		
3099												
3100												
3101	Warning: This data set only has 2 observations!											
3102	Data set is too small to compute reliable and meaningful statistics and estimates!											
3103	The data set for variable Nitrate as Nitrogen (mw-47-55) was not processed!											
3104												
3105	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3106	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3107												
3108												
3109												
3110	Nitrate as Nitrogen (mw-48)											
3111												
3112	General Statistics											
3113					Number of Valid Data	1			Number of Detected Data	0		
3114					Number of Distinct Detected Data	0			Number of Non-Detect Data	1		
3115									Percent Non-Detects	100.00%		
3116												
3117	Warning: This data set only has 1 observations!											
3118	Data set is too small to compute reliable and meaningful statistics and estimates!											
3119	The data set for variable Nitrate as Nitrogen (mw-48) was not processed!											
3120												
3121	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3122	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3123												
3124												
3125												
3126	Nitrate as Nitrogen (mw-49-135)											
3127												

	A	B	C	D	E	F	G	H	I	J	K	L
3128	General Statistics											
3129					Number of Valid Data	2				Number of Detected Data		1
3130					Number of Distinct Detected Data	1				Number of Non-Detect Data		1
3131										Percent Non-Detects		50.00%
3132												
3133	Warning: This data set only has 2 observations!											
3134	Data set is too small to compute reliable and meaningful statistics and estimates!											
3135	The data set for variable Nitrate as Nitrogen (mw-49-135) was not processed!											
3136												
3137	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3138	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3139												
3140												
3141												
3142	Nitrate as Nitrogen (mw-49-275)											
3143												
3144	General Statistics											
3145					Number of Valid Data	2				Number of Detected Data		1
3146					Number of Distinct Detected Data	1				Number of Non-Detect Data		1
3147										Percent Non-Detects		50.00%
3148												
3149	Warning: This data set only has 2 observations!											
3150	Data set is too small to compute reliable and meaningful statistics and estimates!											
3151	The data set for variable Nitrate as Nitrogen (mw-49-275) was not processed!											
3152												
3153	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3154	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3155												
3156												
3157												
3158	Nitrate as Nitrogen (mw-49-365)											
3159												
3160	General Statistics											
3161					Number of Valid Data	2				Number of Detected Data		0
3162					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
3163										Percent Non-Detects		100.00%
3164												
3165	Warning: This data set only has 2 observations!											
3166	Data set is too small to compute reliable and meaningful statistics and estimates!											
3167	The data set for variable Nitrate as Nitrogen (mw-49-365) was not processed!											
3168												
3169	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3170	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3171												
3172												
3173												
3174	Nitrate as Nitrogen (mw-5)											
3175												
3176	General Statistics											
3177					Number of Valid Observations	2				Number of Distinct Observations		2
3178												
3179												
3180	Warning: This data set only has 2 observations!											

	A	B	C	D	E	F	G	H	I	J	K	L
3181	Data set is too small to compute reliable and meaningful statistics and estimates!											
3182	The data set for variable Nitrate as Nitrogen (mw-5) was not processed!											
3183												
3184	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3185	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3186												
3187												
3188												
3189	Nitrate as Nitrogen (mw-50-095)											
3190												
3191	General Statistics											
3192	Number of Valid Observations	1				Number of Distinct Observations	1					
3193												
3194												
3195	Warning: This data set only has 1 observations!											
3196	Data set is too small to compute reliable and meaningful statistics and estimates!											
3197	The data set for variable Nitrate as Nitrogen (mw-50-095) was not processed!											
3198												
3199	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3200	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3201												
3202												
3203												
3204	Nitrate as Nitrogen (mw-50-200)											
3205												
3206	General Statistics											
3207	Number of Valid Observations	1				Number of Distinct Observations	1					
3208												
3209												
3210	Warning: This data set only has 1 observations!											
3211	Data set is too small to compute reliable and meaningful statistics and estimates!											
3212	The data set for variable Nitrate as Nitrogen (mw-50-200) was not processed!											
3213												
3214	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3215	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3216												
3217												
3218												
3219	Nitrate as Nitrogen (mw-51)											
3220												
3221	General Statistics											
3222	Number of Valid Observations	1				Number of Distinct Observations	1					
3223												
3224												
3225	Warning: This data set only has 1 observations!											
3226	Data set is too small to compute reliable and meaningful statistics and estimates!											
3227	The data set for variable Nitrate as Nitrogen (mw-51) was not processed!											
3228												
3229	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3230	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3231												
3232												
3233												

	A	B	C	D	E	F	G	H	I	J	K	L
3234	**Nitrate as Nitrogen (mw-52d)**											
3235												
3236						**General Statistics**						
3237					Number of Valid Data	4			Number of Detected Data	1		
3238					Number of Distinct Detected Data	1			Number of Non-Detect Data	3		
3239									Percent Non-Detects	75.00%		
3240												
3241						**Warning: This data set only has 4 observations!**						
3242						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
3243						**The data set for variable Nitrate as Nitrogen (mw-52d) was not processed!**						
3244												
3245						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
3246						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
3247												
3248												
3249												
3250	**Nitrate as Nitrogen (mw-52m)**											
3251												
3252						**General Statistics**						
3253					Number of Valid Data	4			Number of Detected Data	1		
3254					Number of Distinct Detected Data	1			Number of Non-Detect Data	3		
3255									Percent Non-Detects	75.00%		
3256												
3257						**Warning: This data set only has 4 observations!**						
3258						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
3259						**The data set for variable Nitrate as Nitrogen (mw-52m) was not processed!**						
3260												
3261						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
3262						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
3263												
3264												
3265												
3266	**Nitrate as Nitrogen (mw-52s)**											
3267												
3268						**General Statistics**						
3269					Number of Valid Data	4			Number of Detected Data	2		
3270					Number of Distinct Detected Data	2			Number of Non-Detect Data	2		
3271									Percent Non-Detects	50.00%		
3272												
3273						**Warning: This data set only has 4 observations!**						
3274						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
3275						**The data set for variable Nitrate as Nitrogen (mw-52s) was not processed!**						
3276												
3277						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
3278						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
3279												
3280												
3281												
3282	**Nitrate as Nitrogen (mw-53d)**											
3283												
3284						**General Statistics**						
3285					Number of Valid Data	4			Number of Detected Data	0		
3286					Number of Distinct Detected Data	0			Number of Non-Detect Data	4		

3287											Percent Non-Detects	100.00%
3288												
3289	Warning: This data set only has 4 observations!											
3290	Data set is too small to compute reliable and meaningful statistics and estimates!											
3291	The data set for variable Nitrate as Nitrogen (mw-53d) was not processed!											
3292												
3293	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3294	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3295												
3296												
3297												
3298	Nitrate as Nitrogen (mw-53m)											
3299												
3300	General Statistics											
3301						Number of Valid Data	4				Number of Detected Data	1
3302						Number of Distinct Detected Data	1				Number of Non-Detect Data	3
3303											Percent Non-Detects	75.00%
3304												
3305	Warning: This data set only has 4 observations!											
3306	Data set is too small to compute reliable and meaningful statistics and estimates!											
3307	The data set for variable Nitrate as Nitrogen (mw-53m) was not processed!											
3308												
3309	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3310	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3311												
3312												
3313												
3314	Nitrate as Nitrogen (mw-54-140)											
3315												
3316	General Statistics											
3317						Number of Valid Data	1				Number of Detected Data	0
3318						Number of Distinct Detected Data	0				Number of Non-Detect Data	1
3319											Percent Non-Detects	100.00%
3320												
3321	Warning: This data set only has 1 observations!											
3322	Data set is too small to compute reliable and meaningful statistics and estimates!											
3323	The data set for variable Nitrate as Nitrogen (mw-54-140) was not processed!											
3324												
3325	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3326	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3327												
3328												
3329												
3330	Nitrate as Nitrogen (mw-54-195)											
3331												
3332	General Statistics											
3333						Number of Valid Data	1				Number of Detected Data	0
3334						Number of Distinct Detected Data	0				Number of Non-Detect Data	1
3335											Percent Non-Detects	100.00%
3336												
3337	Warning: This data set only has 1 observations!											
3338	Data set is too small to compute reliable and meaningful statistics and estimates!											
3339	The data set for variable Nitrate as Nitrogen (mw-54-195) was not processed!											

	A	B	C	D	E	F	G	H	I	J	K	L
3340												
3341	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3342	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3343												
3344												
3345												
3346	Nitrate as Nitrogen (mw-54-85)											
3347												
3348	General Statistics											
3349						Number of Valid Data	1			Number of Detected Data	0	
3350						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
3351										Percent Non-Detects	100.00%	
3352												
3353	Warning: This data set only has 1 observations!											
3354	Data set is too small to compute reliable and meaningful statistics and estimates!											
3355	The data set for variable Nitrate as Nitrogen (mw-54-85) was not processed!											
3356												
3357	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3358	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3359												
3360												
3361												
3362	Nitrate as Nitrogen (mw-55-120)											
3363												
3364	General Statistics											
3365						Number of Valid Data	1			Number of Detected Data	0	
3366						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
3367										Percent Non-Detects	100.00%	
3368												
3369	Warning: This data set only has 1 observations!											
3370	Data set is too small to compute reliable and meaningful statistics and estimates!											
3371	The data set for variable Nitrate as Nitrogen (mw-55-120) was not processed!											
3372												
3373	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3374	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3375												
3376												
3377												
3378	Nitrate as Nitrogen (mw-55-45)											
3379												
3380	General Statistics											
3381						Number of Valid Data	1			Number of Detected Data	0	
3382						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
3383										Percent Non-Detects	100.00%	
3384												
3385	Warning: This data set only has 1 observations!											
3386	Data set is too small to compute reliable and meaningful statistics and estimates!											
3387	The data set for variable Nitrate as Nitrogen (mw-55-45) was not processed!											
3388												
3389	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3390	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3391												
3392												

	A	B	C	D	E	F	G	H	I	J	K	L
3393												
3394	**Nitrate as Nitrogen (mw-56d)**											
3395												
3396	**General Statistics**											
3397					Number of Valid Data	1			Number of Detected Data			0
3398					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
3399									Percent Non-Detects			100.00%
3400												
3401	**Warning: This data set only has 1 observations!**											
3402	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3403	**The data set for variable Nitrate as Nitrogen (mw-56d) was not processed!**											
3404												
3405	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3406	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3407												
3408												
3409												
3410	**Nitrate as Nitrogen (mw-56m)**											
3411												
3412	**General Statistics**											
3413					Number of Valid Data	1			Number of Detected Data			0
3414					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
3415									Percent Non-Detects			100.00%
3416												
3417	**Warning: This data set only has 1 observations!**											
3418	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3419	**The data set for variable Nitrate as Nitrogen (mw-56m) was not processed!**											
3420												
3421	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3422	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3423												
3424												
3425												
3426	**Nitrate as Nitrogen (mw-56s)**											
3427												
3428	**General Statistics**											
3429					Number of Valid Data	1			Number of Detected Data			0
3430					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
3431									Percent Non-Detects			100.00%
3432												
3433	**Warning: This data set only has 1 observations!**											
3434	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3435	**The data set for variable Nitrate as Nitrogen (mw-56s) was not processed!**											
3436												
3437	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3438	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3439												
3440												
3441												
3442	**Nitrate as Nitrogen (mw-6)**											
3443												
3444	**General Statistics**											
3445					Number of Valid Observations	2			Number of Distinct Observations			2

	A	B	C	D	E	F	G	H	I	J	K	L
3446												
3447												
3448	**Warning: This data set only has 2 observations!**											
3449	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3450	**The data set for variable Nitrate as Nitrogen (mw-6) was not processed!**											
3451												
3452	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3453	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3454												
3455												
3456												
3457	**Nitrate as Nitrogen (mw-7)**											
3458												
3459	**General Statistics**											
3460	Number of Valid Observations	2					Number of Distinct Observations	2				
3461												
3462												
3463	**Warning: This data set only has 2 observations!**											
3464	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3465	**The data set for variable Nitrate as Nitrogen (mw-7) was not processed!**											
3466												
3467	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3468	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3469												
3470												
3471												
3472	**Nitrate as Nitrogen (mw-8)**											
3473												
3474	**General Statistics**											
3475	Number of Valid Observations	2					Number of Distinct Observations	2				
3476												
3477												
3478	**Warning: This data set only has 2 observations!**											
3479	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3480	**The data set for variable Nitrate as Nitrogen (mw-8) was not processed!**											
3481												
3482	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3483	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3484												
3485												
3486												
3487	**Nitrate as Nitrogen (mw-9)**											
3488												
3489	**General Statistics**											
3490	Number of Valid Observations	7					Number of Distinct Observations	7				
3491												
3492	**Raw Statistics**						**Log-transformed Statistics**					
3493	Minimum	1.626					Minimum of Log Data	0.486				
3494	Maximum	22.6					Maximum of Log Data	3.118				
3495	Mean	7.922					Mean of log Data	1.657				
3496	Median	8.6					SD of log Data	1.023				
3497	SD	7.413										
3498	Coefficient of Variation	0.936										

3499					Skewness	1.434						
3500												
3501												
3502	**Warning: A sample size of 'n' = 7 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
3503												
3504	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
3505	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3506												
3507												
3508	**Warning: There are only 7 Values in this data**											
3509	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
3510	**the resulting calculations may not be reliable enough to draw conclusions**											
3511												
3512	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
3513												
3514	**Relevant UCL Statistics**											
3515	**Normal Distribution Test**						**Lognormal Distribution Test**					
3516	Shapiro Wilk Test Statistic	0.812					Shapiro Wilk Test Statistic	0.867				
3517	Shapiro Wilk Critical Value	0.803					Shapiro Wilk Critical Value	0.803				
3518	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3519												
3520	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3521	95% Student's-t UCL	13.37					95% H-UCL	42.61				
3522	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	21.61				
3523	95% Adjusted-CLT UCL	14.15					97.5% Chebyshev (MVUE) UCL	27.49				
3524	95% Modified-t UCL	13.62					99% Chebyshev (MVUE) UCL	39.03				
3525												
3526	**Gamma Distribution Test**						**Data Distribution**					
3527	k star (bias corrected)	0.87					**Data appear Normal at 5% Significance Level**					
3528	Theta Star	9.109										
3529	nu star	12.18										
3530	Approximate Chi Square Value (.05)	5.343					**Nonparametric Statistics**					
3531	Adjusted Level of Significance	0.0158					95% CLT UCL	12.53				
3532	Adjusted Chi Square Value	4.06					95% Jackknife UCL	13.37				
3533							95% Standard Bootstrap UCL	12.18				
3534	Anderson-Darling Test Statistic	0.528					95% Bootstrap-t UCL	16.31				
3535	Anderson-Darling 5% Critical Value	0.723					95% Hall's Bootstrap UCL	28.56				
3536	Kolmogorov-Smirnov Test Statistic	0.262					95% Percentile Bootstrap UCL	12.14				
3537	Kolmogorov-Smirnov 5% Critical Value	0.318					95% BCA Bootstrap UCL	13.81				
3538	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	20.13				
3539							97.5% Chebyshev(Mean, Sd) UCL	25.42				
3540	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	35.8				
3541	95% Approximate Gamma UCL	18.05										
3542	95% Adjusted Gamma UCL	23.76										
3543												
3544	**Potential UCL to Use**						Use 95% Student's-t UCL	13.37				
3545												
3546												
3547	**Nitrate as Nitrogen (ow-1d)**											
3548												
3549	**General Statistics**											
3550	Number of Valid Observations	16					Number of Distinct Observations	16				
3551												

3552	**Raw Statistics**						**Log-transformed Statistics**					
3553					Minimum	0.252					Minimum of Log Data	-1.378
3554					Maximum	3.44					Maximum of Log Data	1.235
3555					Mean	2.006					Mean of log Data	0.383
3556					Median	2.35					SD of log Data	0.962
3557					SD	1.183						
3558					Coefficient of Variation	0.59						
3559					Skewness	-0.553						
3560												
3561	**Relevant UCL Statistics**											
3562	**Normal Distribution Test**						**Lognormal Distribution Test**					
3563					Shapiro Wilk Test Statistic	0.846					Shapiro Wilk Test Statistic	0.768
3564					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
3565	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3566												
3567	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3568					95% Student's-t UCL	2.524					95% H-UCL	4.49
3569	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	4.803
3570					95% Adjusted-CLT UCL	2.449					97.5% Chebyshev (MVUE) UCL	5.913
3571					95% Modified-t UCL	2.517					99% Chebyshev (MVUE) UCL	8.093
3572												
3573	**Gamma Distribution Test**						**Data Distribution**					
3574					k star (bias corrected)	1.458	**Data do not follow a Discernable Distribution (0.05)**					
3575					Theta Star	1.376						
3576					nu star	46.64						
3577					Approximate Chi Square Value (.05)	31.97	**Nonparametric Statistics**					
3578					Adjusted Level of Significance	0.0335					95% CLT UCL	2.492
3579					Adjusted Chi Square Value	30.59					95% Jackknife UCL	2.524
3580											95% Standard Bootstrap UCL	2.476
3581					Anderson-Darling Test Statistic	1.579					95% Bootstrap-t UCL	2.491
3582					Anderson-Darling 5% Critical Value	0.753					95% Hall's Bootstrap UCL	2.429
3583					Kolmogorov-Smirnov Test Statistic	0.304					95% Percentile Bootstrap UCL	2.468
3584					Kolmogorov-Smirnov 5% Critical Value	0.218					95% BCA Bootstrap UCL	2.443
3585	**Data not Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	3.295
3586											97.5% Chebyshev(Mean, Sd) UCL	3.853
3587	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	4.948
3588					95% Approximate Gamma UCL	2.926						
3589					95% Adjusted Gamma UCL	3.058						
3590												
3591	**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL					3.295
3592												
3593												
3594	**Nitrate as Nitrogen (ow-1m)**											
3595												
3596	**General Statistics**											
3597					Number of Valid Observations	16					Number of Distinct Observations	16
3598												
3599	**Raw Statistics**						**Log-transformed Statistics**					
3600					Minimum	0.892					Minimum of Log Data	-0.114
3601					Maximum	6.49					Maximum of Log Data	1.87
3602					Mean	2.49					Mean of log Data	0.759
3603					Median	2.505					SD of log Data	0.576
3604					SD	1.471						

3605					Coefficient of Variation	0.591						
3606					Skewness	1.414						
3607												
3608	**Relevant UCL Statistics**											
3609	**Normal Distribution Test**						**Lognormal Distribution Test**					
3610					Shapiro Wilk Test Statistic	0.856					Shapiro Wilk Test Statistic	0.934
3611					Shapiro Wilk Critical Value	0.887					Shapiro Wilk Critical Value	0.887
3612	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3613												
3614	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3615					95% Student's-t UCL	3.134					95% H-UCL	3.462
3616	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	4.12
3617					95% Adjusted-CLT UCL	3.234					97.5% Chebyshev (MVUE) UCL	4.824
3618					95% Modified-t UCL	3.156					99% Chebyshev (MVUE) UCL	6.207
3619												
3620	**Gamma Distribution Test**						**Data Distribution**					
3621					k star (bias corrected)	2.822	**Data appear Gamma Distributed at 5% Significance Level**					
3622					Theta Star	0.882						
3623					nu star	90.3						
3624					Approximate Chi Square Value (.05)	69.39	**Nonparametric Statistics**					
3625					Adjusted Level of Significance	0.0335					95% CLT UCL	3.095
3626					Adjusted Chi Square Value	67.3					95% Jackknife UCL	3.134
3627											95% Standard Bootstrap UCL	3.077
3628					Anderson-Darling Test Statistic	0.514					95% Bootstrap-t UCL	3.343
3629					Anderson-Darling 5% Critical Value	0.743					95% Hall's Bootstrap UCL	3.946
3630					Kolmogorov-Smirnov Test Statistic	0.179					95% Percentile Bootstrap UCL	3.094
3631					Kolmogorov-Smirnov 5% Critical Value	0.216					95% BCA Bootstrap UCL	3.246
3632	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	4.093
3633											97.5% Chebyshev(Mean, Sd) UCL	4.786
3634	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	6.149
3635					95% Approximate Gamma UCL	3.24						
3636					95% Adjusted Gamma UCL	3.34						
3637												
3638	**Potential UCL to Use**										Use 95% Approximate Gamma UCL	3.24
3639												
3640												
3641	**Nitrate as Nitrogen (ow-1s)**											
3642												
3643	**General Statistics**											
3644					Number of Valid Observations	14					Number of Distinct Observations	13
3645												
3646	**Raw Statistics**						**Log-transformed Statistics**					
3647					Minimum	1.68					Minimum of Log Data	0.519
3648					Maximum	4.02					Maximum of Log Data	1.391
3649					Mean	3.049					Mean of log Data	1.096
3650					Median	3.17					SD of log Data	0.209
3651					SD	0.558						
3652					Coefficient of Variation	0.183						
3653					Skewness	-0.908						
3654												
3655	**Relevant UCL Statistics**											
3656	**Normal Distribution Test**						**Lognormal Distribution Test**					
3657					Shapiro Wilk Test Statistic	0.925					Shapiro Wilk Test Statistic	0.85

3658				Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value	0.874	
3659	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3660												
3661	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3662				95% Student's-t UCL	3.313					95% H-UCL	3.4	
3663	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	3.801	
3664				95% Adjusted-CLT UCL	3.256					97.5% Chebyshev (MVUE) UCL	4.125	
3665				95% Modified-t UCL	3.307					99% Chebyshev (MVUE) UCL	4.759	
3666												
3667	**Gamma Distribution Test**						**Data Distribution**					
3668				k star (bias corrected)	21.54		**Data appear Normal at 5% Significance Level**					
3669				Theta Star	0.142							
3670				nu star	603							
3671				Approximate Chi Square Value (.05)	547.1		**Nonparametric Statistics**					
3672				Adjusted Level of Significance	0.0312					95% CLT UCL	3.294	
3673				Adjusted Chi Square Value	540					95% Jackknife UCL	3.313	
3674										95% Standard Bootstrap UCL	3.29	
3675				Anderson-Darling Test Statistic	0.731					95% Bootstrap-t UCL	3.277	
3676				Anderson-Darling 5% Critical Value	0.734					95% Hall's Bootstrap UCL	3.273	
3677				Kolmogorov-Smirnov Test Statistic	0.251					95% Percentile Bootstrap UCL	3.269	
3678				Kolmogorov-Smirnov 5% Critical Value	0.228					95% BCA Bootstrap UCL	3.246	
3679	**Data follow Appr. Gamma Distribution at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	3.699	
3680										97.5% Chebyshev(Mean, Sd) UCL	3.98	
3681	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	4.533	
3682				95% Approximate Gamma UCL	3.361							
3683				95% Adjusted Gamma UCL	3.405							
3684												
3685	**Potential UCL to Use**									Use 95% Student's-t UCL	3.313	
3686												
3687												
3688	**Nitrate as Nitrogen (ow-2d)**											
3689												
3690	**General Statistics**											
3691				Number of Valid Data	15					Number of Detected Data	14	
3692				Number of Distinct Detected Data	13					Number of Non-Detect Data	1	
3693										Percent Non-Detects	6.67%	
3694												
3695	**Raw Statistics**						**Log-transformed Statistics**					
3696				Minimum Detected	0.107					Minimum Detected	-2.235	
3697				Maximum Detected	7.57					Maximum Detected	2.024	
3698				Mean of Detected	3.152					Mean of Detected	0.931	
3699				SD of Detected	1.534					SD of Detected	0.951	
3700				Minimum Non-Detect	0.1					Minimum Non-Detect	-2.303	
3701				Maximum Non-Detect	0.1					Maximum Non-Detect	-2.303	
3702												
3703												
3704	**UCL Statistics**											
3705	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3706				Shapiro Wilk Test Statistic	0.741					Shapiro Wilk Test Statistic	0.538	
3707				5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874	
3708	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3709												
3710	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					

3711				DL/2 Substitution Method						DL/2 Substitution Method		
3712				Mean	2.945					Mean	0.669	
3713				SD	1.682					SD	1.367	
3714				95% DL/2 (t) UCL	3.71					95% H-Stat (DL/2) UCL	11.66	
3715												
3716				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
3717				Mean	2.901					Mean in Log Scale	0.827	
3718				SD	1.719					SD in Log Scale	1	
3719				95% MLE (t) UCL	3.682					Mean in Original Scale	2.978	
3720				95% MLE (Tiku) UCL	3.692					SD in Original Scale	1.625	
3721										95% Percentile Bootstrap UCL	3.672	
3722										95% BCA Bootstrap UCL	3.755	
3723												
3724				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
3725				k star (bias corrected)	1.978					**Data do not follow a Discernable Distribution (0.05)**		
3726				Theta Star	1.594							
3727				nu star	55.38							
3728												
3729				A-D Test Statistic	2.153					**Nonparametric Statistics**		
3730				5% A-D Critical Value	0.744					Kaplan-Meier (KM) Method		
3731				K-S Test Statistic	0.744					Mean	2.949	
3732				5% K-S Critical Value	0.231					SD	1.618	
3733				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.433	
3734										95% KM (t) UCL	3.713	
3735				**Assuming Gamma Distribution**						95% KM (z) UCL	3.662	
3736				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	3.718	
3737				Minimum	0.107					95% KM (bootstrap t) UCL	3.788	
3738				Maximum	7.57					95% KM (BCA) UCL	3.831	
3739				Mean	2.992					95% KM (Percentile Bootstrap) UCL	3.72	
3740				Median	2.89					95% KM (Chebyshev) UCL	4.839	
3741				SD	1.604					97.5% KM (Chebyshev) UCL	5.656	
3742				k star	1.79					99% KM (Chebyshev) UCL	7.262	
3743				Theta star	1.672							
3744				Nu star	53.7					**Potential UCLs to Use**		
3745				AppChi2	37.86					95% KM (Chebyshev) UCL	4.839	
3746				95% Gamma Approximate UCL	4.243							
3747				95% Adjusted Gamma UCL	4.435							
3748	**Note: DL/2 is not a recommended method.**											
3749												
3750												
3751	**Nitrate as Nitrogen (ow-2m)**											
3752												
3753						**General Statistics**							
3754				Number of Valid Observations	15					Number of Distinct Observations	14	
3755												
3756				**Raw Statistics**						**Log-transformed Statistics**		
3757				Minimum	0.574					Minimum of Log Data	-0.555	
3758				Maximum	7.16					Maximum of Log Data	1.969	
3759				Mean	2.804					Mean of log Data	0.871	
3760				Median	2.62					SD of log Data	0.632	
3761				SD	1.573							
3762				Coefficient of Variation	0.561							
3763				Skewness	1.391							

3764												
3765	**Relevant UCL Statistics**											
3766	**Normal Distribution Test**						**Lognormal Distribution Test**					
3767				Shapiro Wilk Test Statistic	0.882					Shapiro Wilk Test Statistic	0.9	
3768				Shapiro Wilk Critical Value	0.881					Shapiro Wilk Critical Value	0.881	
3769	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3770												
3771	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3772				95% Student's-t UCL	3.519					95% H-UCL	4.245	
3773	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	5.01	
3774				95% Adjusted-CLT UCL	3.628					97.5% Chebyshev (MVUE) UCL	5.934	
3775				95% Modified-t UCL	3.543					99% Chebyshev (MVUE) UCL	7.751	
3776												
3777	**Gamma Distribution Test**						**Data Distribution**					
3778				k star (bias corrected)	2.667		**Data appear Normal at 5% Significance Level**					
3779				Theta Star	1.051							
3780				nu star	80.02							
3781				Approximate Chi Square Value (.05)	60.41		**Nonparametric Statistics**					
3782				Adjusted Level of Significance	0.0324					95% CLT UCL	3.472	
3783				Adjusted Chi Square Value	58.32					95% Jackknife UCL	3.519	
3784										95% Standard Bootstrap UCL	3.428	
3785				Anderson-Darling Test Statistic	0.523					95% Bootstrap-t UCL	3.773	
3786				Anderson-Darling 5% Critical Value	0.743					95% Hall's Bootstrap UCL	4.851	
3787				Kolmogorov-Smirnov Test Statistic	0.179					95% Percentile Bootstrap UCL	3.49	
3788				Kolmogorov-Smirnov 5% Critical Value	0.223					95% BCA Bootstrap UCL	3.647	
3789	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	4.574	
3790										97.5% Chebyshev(Mean, Sd) UCL	5.34	
3791	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	6.845	
3792				95% Approximate Gamma UCL	3.714							
3793				95% Adjusted Gamma UCL	3.847							
3794												
3795	**Potential UCL to Use**									Use 95% Student's-t UCL	3.519	
3796												
3797												
3798	**Nitrate as Nitrogen (ow-2s)**											
3799												
3800	**General Statistics**											
3801				Number of Valid Observations	14					Number of Distinct Observations	14	
3802												
3803	**Raw Statistics**						**Log-transformed Statistics**					
3804				Minimum	3.24					Minimum of Log Data	1.176	
3805				Maximum	7.75					Maximum of Log Data	2.048	
3806				Mean	4.384					Mean of log Data	1.451	
3807				Median	4.038					SD of log Data	0.229	
3808				SD	1.162							
3809				Coefficient of Variation	0.265							
3810				Skewness	2.032							
3811												
3812	**Relevant UCL Statistics**											
3813	**Normal Distribution Test**						**Lognormal Distribution Test**					
3814				Shapiro Wilk Test Statistic	0.801					Shapiro Wilk Test Statistic	0.895	
3815				Shapiro Wilk Critical Value	0.874					Shapiro Wilk Critical Value	0.874	
3816	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					

3817												
3818	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3819				95% Student's-t UCL	4.934					95% H-UCL	4.926	
3820	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	5.55	
3821				95% Adjusted-CLT UCL	5.075					97.5% Chebyshev (MVUE) UCL	6.058	
3822				95% Modified-t UCL	4.962					99% Chebyshev (MVUE) UCL	7.058	
3823												
3824	**Gamma Distribution Test**						**Data Distribution**					
3825				k star (bias corrected)	14.88		**Data appear Gamma Distributed at 5% Significance Level**					
3826				Theta Star	0.295							
3827				nu star	416.7							
3828				Approximate Chi Square Value (.05)	370.4		**Nonparametric Statistics**					
3829				Adjusted Level of Significance	0.0312					95% CLT UCL	4.895	
3830				Adjusted Chi Square Value	364.6					95% Jackknife UCL	4.934	
3831										95% Standard Bootstrap UCL	4.874	
3832				Anderson-Darling Test Statistic	0.603					95% Bootstrap-t UCL	5.314	
3833				Anderson-Darling 5% Critical Value	0.734					95% Hall's Bootstrap UCL	7.133	
3834				Kolmogorov-Smirnov Test Statistic	0.166					95% Percentile Bootstrap UCL	4.906	
3835				Kolmogorov-Smirnov 5% Critical Value	0.228					95% BCA Bootstrap UCL	5.018	
3836	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	5.737	
3837										97.5% Chebyshev(Mean, Sd) UCL	6.323	
3838	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	7.473	
3839				95% Approximate Gamma UCL	4.932							
3840				95% Adjusted Gamma UCL	5.011							
3841												
3842	**Potential UCL to Use**									Use 95% Approximate Gamma UCL	4.932	
3843												
3844												
3845	**Nitrate as Nitrogen (ow-3d)**											
3846												
3847	**General Statistics**											
3848				Number of Valid Data	2					Number of Detected Data	1	
3849				Number of Distinct Detected Data	1					Number of Non-Detect Data	1	
3850										Percent Non-Detects	50.00%	
3851												
3852	**Warning: This data set only has 2 observations!**											
3853	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3854	**The data set for variable Nitrate as Nitrogen (ow-3d) was not processed!**											
3855												
3856	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3857	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3858												
3859												
3860												
3861	**Nitrate as Nitrogen (ow-3m)**											
3862												
3863	**General Statistics**											
3864				Number of Valid Observations	4					Number of Distinct Observations	4	
3865												
3866												
3867	**Warning: This data set only has 4 observations!**											
3868	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3869	**The data set for variable Nitrate as Nitrogen (ow-3m) was not processed!**											

3870												
3871	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3872	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3873												
3874												
3875												
3876	**Nitrate as Nitrogen (ow-3s)**											
3877												
3878	**General Statistics**											
3879	Number of Valid Observations	3				Number of Distinct Observations	3					
3880												
3881												
3882	**Warning: This data set only has 3 observations!**											
3883	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3884	**The data set for variable Nitrate as Nitrogen (ow-3s) was not processed!**											
3885												
3886	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3887	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3888												
3889												
3890												
3891	**Nitrate as Nitrogen (ow-5d)**											
3892												
3893	**General Statistics**											
3894	Number of Valid Observations	15				Number of Distinct Observations	15					
3895												
3896	**Raw Statistics**					**Log-transformed Statistics**						
3897	Minimum	0.151				Minimum of Log Data	-1.89					
3898	Maximum	5.99				Maximum of Log Data	1.79					
3899	Mean	2.146				Mean of log Data	0.3					
3900	Median	2.615				SD of log Data	1.218					
3901	SD	1.572										
3902	Coefficient of Variation	0.732										
3903	Skewness	0.666										
3904												
3905	**Relevant UCL Statistics**											
3906	**Normal Distribution Test**					**Lognormal Distribution Test**						
3907	Shapiro Wilk Test Statistic	0.891				Shapiro Wilk Test Statistic	0.804					
3908	Shapiro Wilk Critical Value	0.881				Shapiro Wilk Critical Value	0.881					
3909	**Data appear Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**						
3910												
3911	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
3912	95% Student's-t UCL	2.861				95% H-UCL	7.801					
3913	**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL	6.653					
3914	95% Adjusted-CLT UCL	2.888				97.5% Chebyshev (MVUE) UCL	8.395					
3915	95% Modified-t UCL	2.872				99% Chebyshev (MVUE) UCL	11.82					
3916												
3917	**Gamma Distribution Test**					**Data Distribution**						
3918	k star (bias corrected)	1.02				**Data appear Normal at 5% Significance Level**						
3919	Theta Star	2.105										
3920	nu star	30.59										
3921	Approximate Chi Square Value (.05)	18.96				**Nonparametric Statistics**						
3922	Adjusted Level of Significance	0.0324				95% CLT UCL	2.813					

3923				Adjusted Chi Square Value	17.84					95% Jackknife UCL	2.861
3924										95% Standard Bootstrap UCL	2.787
3925				Anderson-Darling Test Statistic	1.095					95% Bootstrap-t UCL	2.915
3926				Anderson-Darling 5% Critical Value	0.759					95% Hall's Bootstrap UCL	3.05
3927				Kolmogorov-Smirnov Test Statistic	0.238					95% Percentile Bootstrap UCL	2.8
3928				Kolmogorov-Smirnov 5% Critical Value	0.227					95% BCA Bootstrap UCL	2.895
3929				**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	3.915
3930										97.5% Chebyshev(Mean, Sd) UCL	4.68
3931				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	6.184
3932				95% Approximate Gamma UCL	3.463						
3933				95% Adjusted Gamma UCL	3.681						
3934											
3935				**Potential UCL to Use**						Use 95% Student's-t UCL	2.861
3936											
3937											
3938	**Nitrate as Nitrogen (ow-5m)**										
3939											
3940				**General Statistics**							
3941				Number of Valid Observations	15					Number of Distinct Observations	15
3942											
3943				**Raw Statistics**						**Log-transformed Statistics**	
3944				Minimum	0.51					Minimum of Log Data	-0.673
3945				Maximum	8.155					Maximum of Log Data	2.099
3946				Mean	1.964					Mean of log Data	0.345
3947				Median	1.4					SD of log Data	0.811
3948				SD	1.939						
3949				Coefficient of Variation	0.987						
3950				Skewness	2.539						
3951											
3952				**Relevant UCL Statistics**							
3953				**Normal Distribution Test**						**Lognormal Distribution Test**	
3954				Shapiro Wilk Test Statistic	0.696					Shapiro Wilk Test Statistic	0.906
3955				Shapiro Wilk Critical Value	0.881					Shapiro Wilk Critical Value	0.881
3956				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
3957											
3958				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3959				95% Student's-t UCL	2.846					95% H-UCL	3.34
3960				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	3.767
3961				95% Adjusted-CLT UCL	3.138					97.5% Chebyshev (MVUE) UCL	4.571
3962				95% Modified-t UCL	2.9					99% Chebyshev (MVUE) UCL	6.152
3963											
3964				**Gamma Distribution Test**						**Data Distribution**	
3965				k star (bias corrected)	1.373					**Data appear Gamma Distributed at 5% Significance Level**	
3966				Theta Star	1.431						
3967				nu star	41.18						
3968				Approximate Chi Square Value (.05)	27.47					**Nonparametric Statistics**	
3969				Adjusted Level of Significance	0.0324					95% CLT UCL	2.787
3970				Adjusted Chi Square Value	26.1					95% Jackknife UCL	2.846
3971										95% Standard Bootstrap UCL	2.756
3972				Anderson-Darling Test Statistic	0.695					95% Bootstrap-t UCL	3.582
3973				Anderson-Darling 5% Critical Value	0.752					95% Hall's Bootstrap UCL	6.208
3974				Kolmogorov-Smirnov Test Statistic	0.208					95% Percentile Bootstrap UCL	2.863
3975				Kolmogorov-Smirnov 5% Critical Value	0.225					95% BCA Bootstrap UCL	3.127

3976	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		4.146
3977										97.5% Chebyshev(Mean, Sd) UCL		5.09
3978	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		6.945
3979				95% Approximate Gamma UCL	2.944							
3980				95% Adjusted Gamma UCL	3.099							
3981												
3982	Potential UCL to Use									Use 95% Approximate Gamma UCL		2.944
3983												
3984												
3985	Nitrate as Nitrogen (ow-5s)											
3986												
3987	General Statistics											
3988				Number of Valid Observations	15					Number of Distinct Observations		14
3989												
3990	Raw Statistics									Log-transformed Statistics		
3991				Minimum	1.74					Minimum of Log Data		0.554
3992				Maximum	7.67					Maximum of Log Data		2.037
3993				Mean	3.851					Mean of log Data		1.298
3994				Median	3.66					SD of log Data		0.326
3995				SD	1.33							
3996				Coefficient of Variation	0.345							
3997				Skewness	1.599							
3998												
3999	Relevant UCL Statistics											
4000	Normal Distribution Test									Lognormal Distribution Test		
4001				Shapiro Wilk Test Statistic	0.868					Shapiro Wilk Test Statistic		0.949
4002				Shapiro Wilk Critical Value	0.881					Shapiro Wilk Critical Value		0.881
4003	Data not Normal at 5% Significance Level									Data appear Lognormal at 5% Significance Level		
4004												
4005	Assuming Normal Distribution									Assuming Lognormal Distribution		
4006				95% Student's-t UCL	4.456					95% H-UCL		4.56
4007	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL		5.281
4008				95% Adjusted-CLT UCL	4.567					97.5% Chebyshev (MVUE) UCL		5.9
4009				95% Modified-t UCL	4.48					99% Chebyshev (MVUE) UCL		7.118
4010												
4011	Gamma Distribution Test									Data Distribution		
4012				k star (bias corrected)	8.149					Data appear Gamma Distributed at 5% Significance Level		
4013				Theta Star	0.473							
4014				nu star	244.5							
4015				Approximate Chi Square Value (.05)	209.3					Nonparametric Statistics		
4016				Adjusted Level of Significance	0.0324					95% CLT UCL		4.416
4017				Adjusted Chi Square Value	205.3					95% Jackknife UCL		4.456
4018										95% Standard Bootstrap UCL		4.388
4019				Anderson-Darling Test Statistic	0.427					95% Bootstrap-t UCL		4.653
4020				Anderson-Darling 5% Critical Value	0.737					95% Hall's Bootstrap UCL		7.406
4021				Kolmogorov-Smirnov Test Statistic	0.142					95% Percentile Bootstrap UCL		4.429
4022				Kolmogorov-Smirnov 5% Critical Value	0.222					95% BCA Bootstrap UCL		4.575
4023	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		5.348
4024										97.5% Chebyshev(Mean, Sd) UCL		5.996
4025	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		7.268
4026				95% Approximate Gamma UCL	4.499							
4027				95% Adjusted Gamma UCL	4.587							
4028												

	A	B	C	D	E	F	G	H	I	J	K	L
4029	Potential UCL to Use						Use 95% Approximate Gamma UCL					4.499
4030												
4031												
4032	Nitrate as Nitrogen (park moabi-4)											
4033												
4034	General Statistics											
4035	Number of Valid Observations					2	Number of Distinct Observations					2
4036												
4037												
4038	Warning: This data set only has 2 observations!											
4039	Data set is too small to compute reliable and meaningful statistics and estimates!											
4040	The data set for variable Nitrate as Nitrogen (park moabi-4) was not processed!											
4041												
4042	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4043	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4044												
4045												
4046												
4047	Nitrate as Nitrogen (pe-1)											
4048												
4049	General Statistics											
4050	Number of Valid Data					4	Number of Detected Data					2
4051	Number of Distinct Detected Data					2	Number of Non-Detect Data					2
4052							Percent Non-Detects					50.00%
4053												
4054	Warning: This data set only has 4 observations!											
4055	Data set is too small to compute reliable and meaningful statistics and estimates!											
4056	The data set for variable Nitrate as Nitrogen (pe-1) was not processed!											
4057												
4058	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4059	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4060												
4061												
4062												
4063	Nitrate as Nitrogen (pge-6)											
4064												
4065	General Statistics											
4066	Number of Valid Observations					4	Number of Distinct Observations					4
4067												
4068												
4069	Warning: This data set only has 4 observations!											
4070	Data set is too small to compute reliable and meaningful statistics and estimates!											
4071	The data set for variable Nitrate as Nitrogen (pge-6) was not processed!											
4072												
4073	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4074	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4075												
4076												
4077												
4078	Nitrate as Nitrogen (pge-7)											
4079												
4080	General Statistics											
4081	Number of Valid Observations					3	Number of Distinct Observations					3

	A	B	C	D	E	F	G	H	I	J	K	L
4082												
4083												
4084	**Warning: This data set only has 3 observations!**											
4085	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4086	**The data set for variable Nitrate as Nitrogen (pge-7) was not processed!**											
4087												
4088	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4089	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4090												
4091												
4092												
4093	**Nitrate as Nitrogen (pge-8)**											
4094												
4095	**General Statistics**											
4096						Number of Valid Data	5			Number of Detected Data	4	
4097						Number of Distinct Detected Data	4			Number of Non-Detect Data	1	
4098										Percent Non-Detects	20.00%	
4099												
4100	**Raw Statistics**							**Log-transformed Statistics**				
4101						Minimum Detected	1.197			Minimum Detected	0.18	
4102						Maximum Detected	3.658			Maximum Detected	1.297	
4103						Mean of Detected	2.501			Mean of Detected	0.797	
4104						SD of Detected	1.318			SD of Detected	0.579	
4105						Minimum Non-Detect	1			Minimum Non-Detect	0	
4106						Maximum Non-Detect	1			Maximum Non-Detect	0	
4107												
4108												
4109	**Warning: There are only 4 Distinct Detected Values in this data**											
4110	**Note: It should be noted that even though bootstrap may be performed on this data set**											
4111	**the resulting calculations may not be reliable enough tp draw conclusions**											
4112												
4113	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
4114												
4115												
4116	**UCL Statistics**											
4117	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
4118						Shapiro Wilk Test Statistic	0.799			Shapiro Wilk Test Statistic	0.827	
4119						5% Shapiro Wilk Critical Value	0.748			5% Shapiro Wilk Critical Value	0.748	
4120	**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
4121												
4122	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
4123						DL/2 Substitution Method				DL/2 Substitution Method		
4124						Mean	2.101			Mean	0.499	
4125						SD	1.45			SD	0.834	
4126						95% DL/2 (t) UCL	3.483			95% H-Stat (DL/2) UCL	13.45	
4127												
4128						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		
4129						Mean	2.036			Mean in Log Scale	0.508	
4130						SD	1.414			SD in Log Scale	0.819	
4131						95% MLE (t) UCL	3.384			Mean in Original Scale	2.105	
4132						95% MLE (Tiku) UCL	3.41			SD in Original Scale	1.444	
4133										95% Percentile Bootstrap UCL	3.148	
4134										95% BCA Bootstrap UCL	3.148	

4135												
4136	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
4137				k star (bias corrected)	1.256		**Data appear Normal at 5% Significance Level**					
4138				Theta Star	1.991							
4139				nu star	10.05							
4140												
4141				A-D Test Statistic	0.541		**Nonparametric Statistics**					
4142				5% A-D Critical Value	0.659		Kaplan-Meier (KM) Method					
4143				K-S Test Statistic	0.659		Mean					2.24
4144				5% K-S Critical Value	0.396		SD					1.146
4145	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.592
4146							95% KM (t) UCL					3.502
4147	**Assuming Gamma Distribution**						95% KM (z) UCL					3.213
4148				Gamma ROS Statistics using Extrapolated Data			95% KM (jackknife) UCL					3.466
4149				Minimum	0.963		95% KM (bootstrap t) UCL					2.904
4150				Maximum	3.658		95% KM (BCA) UCL					3.622
4151				Mean	2.193		95% KM (Percentile Bootstrap) UCL					3.622
4152				Median	1.535		95% KM (Chebyshev) UCL					4.82
4153				SD	1.332		97.5% KM (Chebyshev) UCL					5.936
4154				k star	1.487		99% KM (Chebyshev) UCL					8.129
4155				Theta star	1.475							
4156				Nu star	14.87		**Potential UCLs to Use**					
4157				AppChi2	7.169		95% KM (t) UCL					3.502
4158				95% Gamma Approximate UCL	4.548		95% KM (Percentile Bootstrap) UCL					3.622
4159				95% Adjusted Gamma UCL	N/A							
4160	**Note: DL/2 is not a recommended method.**											
4161												
4162												
4163	**Nitrate as Nitrogen (pt-1d)**											
4164												
4165	**General Statistics**											
4166				Number of Valid Observations	2		Number of Distinct Observations					2
4167												
4168												
4169	**Warning: This data set only has 2 observations!**											
4170	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4171	**The data set for variable Nitrate as Nitrogen (pt-1d) was not processed!**											
4172												
4173	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4174	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4175												
4176												
4177												
4178	**Nitrate as Nitrogen (pt-1m)**											
4179												
4180	**General Statistics**											
4181				Number of Valid Data	2		Number of Detected Data					0
4182				Number of Distinct Detected Data	0		Number of Non-Detect Data					2
4183							Percent Non-Detects					100.00%
4184												
4185	**Warning: This data set only has 2 observations!**											
4186	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4187	**The data set for variable Nitrate as Nitrogen (pt-1m) was not processed!**											

	A	B	C	D	E	F	G	H	I	J	K	L
4188												
4189	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4190	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4191												
4192												
4193												
4194	Nitrate as Nitrogen (pt-1s)											
4195												
4196	General Statistics											
4197					Number of Valid Data	2			Number of Detected Data	0		
4198					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
4199									Percent Non-Detects	100.00%		
4200												
4201	Warning: This data set only has 2 observations!											
4202	Data set is too small to compute reliable and meaningful statistics and estimates!											
4203	The data set for variable Nitrate as Nitrogen (pt-1s) was not processed!											
4204												
4205	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4206	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4207												
4208												
4209												
4210	Nitrate as Nitrogen (pt-2d)											
4211												
4212	General Statistics											
4213					Number of Valid Observations	2			Number of Distinct Observations	2		
4214												
4215												
4216	Warning: This data set only has 2 observations!											
4217	Data set is too small to compute reliable and meaningful statistics and estimates!											
4218	The data set for variable Nitrate as Nitrogen (pt-2d) was not processed!											
4219												
4220	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4221	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4222												
4223												
4224												
4225	Nitrate as Nitrogen (pt-2m)											
4226												
4227	General Statistics											
4228					Number of Valid Data	2			Number of Detected Data	0		
4229					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
4230									Percent Non-Detects	100.00%		
4231												
4232	Warning: This data set only has 2 observations!											
4233	Data set is too small to compute reliable and meaningful statistics and estimates!											
4234	The data set for variable Nitrate as Nitrogen (pt-2m) was not processed!											
4235												
4236	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4237	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4238												
4239												
4240												

	A	B	C	D	E	F	G	H	I	J	K	L
4241	**Nitrate as Nitrogen (pt-2s)**											
4242												
4243	**General Statistics**											
4244					Number of Valid Data	2			Number of Detected Data			0
4245					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
4246									Percent Non-Detects			100.00%
4247												
4248	**Warning: This data set only has 2 observations!**											
4249	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4250	**The data set for variable Nitrate as Nitrogen (pt-2s) was not processed!**											
4251												
4252	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4253	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4254												
4255												
4256												
4257	**Nitrate as Nitrogen (pt-3d)**											
4258												
4259	**General Statistics**											
4260					Number of Valid Observations	2			Number of Distinct Observations			2
4261												
4262												
4263	**Warning: This data set only has 2 observations!**											
4264	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4265	**The data set for variable Nitrate as Nitrogen (pt-3d) was not processed!**											
4266												
4267	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4268	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4269												
4270												
4271												
4272	**Nitrate as Nitrogen (pt-3m)**											
4273												
4274	**General Statistics**											
4275					Number of Valid Data	2			Number of Detected Data			0
4276					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
4277									Percent Non-Detects			100.00%
4278												
4279	**Warning: This data set only has 2 observations!**											
4280	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4281	**The data set for variable Nitrate as Nitrogen (pt-3m) was not processed!**											
4282												
4283	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4284	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4285												
4286												
4287												
4288	**Nitrate as Nitrogen (pt-3s)**											
4289												
4290	**General Statistics**											
4291					Number of Valid Data	2			Number of Detected Data			0
4292					Number of Distinct Detected Data	0			Number of Non-Detect Data			2
4293									Percent Non-Detects			100.00%

	A	B	C	D	E	F	G	H	I	J	K	L
4294												
4295	**Warning: This data set only has 2 observations!**											
4296	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4297	**The data set for variable Nitrate as Nitrogen (pt-3s) was not processed!**											
4298												
4299	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4300	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4301												
4302												
4303												
4304	**Nitrate as Nitrogen (pt-4d)**											
4305												
4306	**General Statistics**											
4307	Number of Valid Observations	2					Number of Distinct Observations	2				
4308												
4309												
4310	**Warning: This data set only has 2 observations!**											
4311	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4312	**The data set for variable Nitrate as Nitrogen (pt-4d) was not processed!**											
4313												
4314	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4315	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4316												
4317												
4318												
4319	**Nitrate as Nitrogen (pt-4m)**											
4320												
4321	**General Statistics**											
4322	Number of Valid Data	2					Number of Detected Data	0				
4323	Number of Distinct Detected Data	0					Number of Non-Detect Data	2				
4324							Percent Non-Detects	100.00%				
4325												
4326	**Warning: This data set only has 2 observations!**											
4327	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4328	**The data set for variable Nitrate as Nitrogen (pt-4m) was not processed!**											
4329												
4330	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4331	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4332												
4333												
4334												
4335	**Nitrate as Nitrogen (pt-4s)**											
4336												
4337	**General Statistics**											
4338	Number of Valid Data	2					Number of Detected Data	0				
4339	Number of Distinct Detected Data	0					Number of Non-Detect Data	2				
4340							Percent Non-Detects	100.00%				
4341												
4342	**Warning: This data set only has 2 observations!**											
4343	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4344	**The data set for variable Nitrate as Nitrogen (pt-4s) was not processed!**											
4345												
4346	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											

	A	B	C	D	E	F	G	H	I	J	K	L
4347	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4348												
4349												
4350												
4351	Nitrate as Nitrogen (pt-5d)											
4352												
4353	General Statistics											
4354					Number of Valid Data	2			Number of Detected Data	1		
4355					Number of Distinct Detected Data	1			Number of Non-Detect Data	1		
4356									Percent Non-Detects	50.00%		
4357												
4358	Warning: This data set only has 2 observations!											
4359	Data set is too small to compute reliable and meaningful statistics and estimates!											
4360	The data set for variable Nitrate as Nitrogen (pt-5d) was not processed!											
4361												
4362	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4363	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4364												
4365												
4366												
4367	Nitrate as Nitrogen (pt-5m)											
4368												
4369	General Statistics											
4370					Number of Valid Data	2			Number of Detected Data	0		
4371					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
4372									Percent Non-Detects	100.00%		
4373												
4374	Warning: This data set only has 2 observations!											
4375	Data set is too small to compute reliable and meaningful statistics and estimates!											
4376	The data set for variable Nitrate as Nitrogen (pt-5m) was not processed!											
4377												
4378	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4379	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4380												
4381												
4382												
4383	Nitrate as Nitrogen (pt-5s)											
4384												
4385	General Statistics											
4386					Number of Valid Data	2			Number of Detected Data	0		
4387					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
4388									Percent Non-Detects	100.00%		
4389												
4390	Warning: This data set only has 2 observations!											
4391	Data set is too small to compute reliable and meaningful statistics and estimates!											
4392	The data set for variable Nitrate as Nitrogen (pt-5s) was not processed!											
4393												
4394	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4395	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4396												
4397												
4398												
4399	Nitrate as Nitrogen (pt-6d)											

	A	B	C	D	E	F	G	H	I	J	K	L
4400												
4401	**General Statistics**											
4402	Number of Valid Observations					2	Number of Distinct Observations					2
4403												
4404												
4405	**Warning: This data set only has 2 observations!**											
4406	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4407	**The data set for variable Nitrate as Nitrogen (pt-6d) was not processed!**											
4408												
4409	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4410	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4411												
4412												
4413												
4414	**Nitrate as Nitrogen (pt-6m)**											
4415												
4416	**General Statistics**											
4417	Number of Valid Data					2	Number of Detected Data					0
4418	Number of Distinct Detected Data					0	Number of Non-Detect Data					2
4419							Percent Non-Detects					100.00%
4420												
4421	**Warning: This data set only has 2 observations!**											
4422	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4423	**The data set for variable Nitrate as Nitrogen (pt-6m) was not processed!**											
4424												
4425	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4426	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4427												
4428												
4429												
4430	**Nitrate as Nitrogen (pt-6s)**											
4431												
4432	**General Statistics**											
4433	Number of Valid Data					3	Number of Detected Data					0
4434	Number of Distinct Detected Data					0	Number of Non-Detect Data					3
4435							Percent Non-Detects					100.00%
4436												
4437	**Warning: This data set only has 3 observations!**											
4438	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4439	**The data set for variable Nitrate as Nitrogen (pt-6s) was not processed!**											
4440												
4441	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4442	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4443												
4444												
4445												
4446	**Nitrate as Nitrogen (pt-7d)**											
4447												
4448	**General Statistics**											
4449	Number of Valid Observations					1	Number of Distinct Observations					1
4450												
4451												
4452	**Warning: This data set only has 1 observations!**											

	A	B	C	D	E	F	G	H	I	J	K	L
4453	Data set is too small to compute reliable and meaningful statistics and estimates!											
4454	The data set for variable Nitrate as Nitrogen (pt-7d) was not processed!											
4455												
4456	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4457	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4458												
4459												
4460												
4461	Nitrate as Nitrogen (pt-7m)											
4462												
4463	General Statistics											
4464	Number of Valid Observations	1				Number of Distinct Observations	1					
4465												
4466												
4467	Warning: This data set only has 1 observations!											
4468	Data set is too small to compute reliable and meaningful statistics and estimates!											
4469	The data set for variable Nitrate as Nitrogen (pt-7m) was not processed!											
4470												
4471	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4472	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4473												
4474												
4475												
4476	Nitrate as Nitrogen (pt-7s)											
4477												
4478	General Statistics											
4479	Number of Valid Observations	1				Number of Distinct Observations	1					
4480												
4481												
4482	Warning: This data set only has 1 observations!											
4483	Data set is too small to compute reliable and meaningful statistics and estimates!											
4484	The data set for variable Nitrate as Nitrogen (pt-7s) was not processed!											
4485												
4486	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4487	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4488												
4489												
4490												
4491	Nitrate as Nitrogen (pt-8d)											
4492												
4493	General Statistics											
4494	Number of Valid Observations	1				Number of Distinct Observations	1					
4495												
4496												
4497	Warning: This data set only has 1 observations!											
4498	Data set is too small to compute reliable and meaningful statistics and estimates!											
4499	The data set for variable Nitrate as Nitrogen (pt-8d) was not processed!											
4500												
4501	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4502	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4503												
4504												
4505												

	A	B	C	D	E	F	G	H	I	J	K	L
4506	**Nitrate as Nitrogen (pt-8m)**											
4507												
4508	**General Statistics**											
4509	Number of Valid Observations	1					Number of Distinct Observations	1				
4510												
4511												
4512	**Warning: This data set only has 1 observations!**											
4513	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4514	**The data set for variable Nitrate as Nitrogen (pt-8m) was not processed!**											
4515												
4516	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4517	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4518												
4519												
4520												
4521	**Nitrate as Nitrogen (pt-8s)**											
4522												
4523	**General Statistics**											
4524	Number of Valid Observations	1					Number of Distinct Observations	1				
4525												
4526												
4527	**Warning: This data set only has 1 observations!**											
4528	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4529	**The data set for variable Nitrate as Nitrogen (pt-8s) was not processed!**											
4530												
4531	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4532	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4533												
4534												
4535												
4536	**Nitrate as Nitrogen (pt-9d)**											
4537												
4538	**General Statistics**											
4539	Number of Valid Observations	1					Number of Distinct Observations	1				
4540												
4541												
4542	**Warning: This data set only has 1 observations!**											
4543	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4544	**The data set for variable Nitrate as Nitrogen (pt-9d) was not processed!**											
4545												
4546	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4547	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4548												
4549												
4550												
4551	**Nitrate as Nitrogen (pt-9m)**											
4552												
4553	**General Statistics**											
4554	Number of Valid Observations	1					Number of Distinct Observations	1				
4555												
4556												
4557	**Warning: This data set only has 1 observations!**											
4558	**Data set is too small to compute reliable and meaningful statistics and estimates!**											

	A	B	C	D	E	F	G	H	I	J	K	L
4559	The data set for variable Nitrate as Nitrogen (pt-9m) was not processed!											
4560												
4561	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4562	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4563												
4564												
4565												
4566	Nitrate as Nitrogen (pt-9s)											
4567												
4568	General Statistics											
4569					Number of Valid Observations	1			Number of Distinct Observations	1		
4570												
4571												
4572	Warning: This data set only has 1 observations!											
4573	Data set is too small to compute reliable and meaningful statistics and estimates!											
4574	The data set for variable Nitrate as Nitrogen (pt-9s) was not processed!											
4575												
4576	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4577	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4578												
4579												
4580												
4581	Nitrate as Nitrogen (pti-1d)											
4582												
4583	General Statistics											
4584					Number of Valid Data	2			Number of Detected Data	1		
4585					Number of Distinct Detected Data	1			Number of Non-Detect Data	1		
4586									Percent Non-Detects	50.00%		
4587												
4588	Warning: This data set only has 2 observations!											
4589	Data set is too small to compute reliable and meaningful statistics and estimates!											
4590	The data set for variable Nitrate as Nitrogen (pti-1d) was not processed!											
4591												
4592	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4593	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4594												
4595												
4596												
4597	Nitrate as Nitrogen (pti-1m)											
4598												
4599	General Statistics											
4600					Number of Valid Data	2			Number of Detected Data	0		
4601					Number of Distinct Detected Data	0			Number of Non-Detect Data	2		
4602									Percent Non-Detects	100.00%		
4603												
4604	Warning: This data set only has 2 observations!											
4605	Data set is too small to compute reliable and meaningful statistics and estimates!											
4606	The data set for variable Nitrate as Nitrogen (pti-1m) was not processed!											
4607												
4608	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4609	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4610												
4611												

	A	B	C	D	E	F	G	H	I	J	K	L
4612												
4613	**Nitrate as Nitrogen (pti-1s)**											
4614												
4615	**General Statistics**											
4616	Number of Valid Data					2	Number of Detected Data					0
4617	Number of Distinct Detected Data					0	Number of Non-Detect Data					2
4618							Percent Non-Detects					100.00%
4619												
4620	**Warning: This data set only has 2 observations!**											
4621	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4622	**The data set for variable Nitrate as Nitrogen (pti-1s) was not processed!**											
4623												
4624	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4625	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4626												
4627												
4628												
4629	**Nitrate as Nitrogen (ptr-1)**											
4630												
4631	**General Statistics**											
4632	Number of Valid Observations					1	Number of Distinct Observations					1
4633												
4634												
4635	**Warning: This data set only has 1 observations!**											
4636	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4637	**The data set for variable Nitrate as Nitrogen (ptr-1) was not processed!**											
4638												
4639	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4640	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4641												
4642												
4643												
4644	**Nitrate as Nitrogen (ptr-2)**											
4645												
4646	**General Statistics**											
4647	Number of Valid Observations					1	Number of Distinct Observations					1
4648												
4649												
4650	**Warning: This data set only has 1 observations!**											
4651	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4652	**The data set for variable Nitrate as Nitrogen (ptr-2) was not processed!**											
4653												
4654	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4655	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4656												
4657												
4658												
4659	**Nitrate as Nitrogen (tw-1)**											
4660												
4661	**General Statistics**											
4662	Number of Valid Observations					1	Number of Distinct Observations					1
4663												
4664												

	A	B	C	D	E	F	G	H	I	J	K	L
4665	Warning: This data set only has 1 observations!											
4666	Data set is too small to compute reliable and meaningful statistics and estimates!											
4667	The data set for variable Nitrate as Nitrogen (tw-1) was not processed!											
4668												
4669	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4670	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4671												
4672												
4673												
4674	Nitrate as Nitrogen (tw-2d)											
4675												
4676	General Statistics											
4677	Number of Valid Observations	4				Number of Distinct Observations	4					
4678												
4679												
4680	Warning: This data set only has 4 observations!											
4681	Data set is too small to compute reliable and meaningful statistics and estimates!											
4682	The data set for variable Nitrate as Nitrogen (tw-2d) was not processed!											
4683												
4684	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4685	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4686												
4687												
4688												
4689	Nitrate as Nitrogen (tw-2s)											
4690												
4691	General Statistics											
4692	Number of Valid Observations	2				Number of Distinct Observations	2					
4693												
4694												
4695	Warning: This data set only has 2 observations!											
4696	Data set is too small to compute reliable and meaningful statistics and estimates!											
4697	The data set for variable Nitrate as Nitrogen (tw-2s) was not processed!											
4698												
4699	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4700	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4701												
4702												
4703												
4704	Nitrate as Nitrogen (tw-3d)											
4705												
4706	General Statistics											
4707	Number of Valid Observations	2				Number of Distinct Observations	2					
4708												
4709												
4710	Warning: This data set only has 2 observations!											
4711	Data set is too small to compute reliable and meaningful statistics and estimates!											
4712	The data set for variable Nitrate as Nitrogen (tw-3d) was not processed!											
4713												
4714	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
4715	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
4716												
4717												

	A	B	C	D	E	F	G	H	I	J	K	L
4718												
4719	**Nitrate as Nitrogen (tw-4)**											
4720												
4721	**General Statistics**											
4722	Number of Valid Observations					1	Number of Distinct Observations					1
4723												
4724												
4725	**Warning: This data set only has 1 observations!**											
4726	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4727	**The data set for variable Nitrate as Nitrogen (tw-4) was not processed!**											
4728												
4729	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4730	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4731												
4732												
4733												
4734	**Nitrate as Nitrogen (tw-5)**											
4735												
4736	**General Statistics**											
4737	Number of Valid Observations					1	Number of Distinct Observations					1
4738												
4739												
4740	**Warning: This data set only has 1 observations!**											
4741	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4742	**The data set for variable Nitrate as Nitrogen (tw-5) was not processed!**											
4743												
4744	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4745	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4746												
4747												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Selenium, dissolved (1)

General Statistics

Number of Valid Data	149	Number of Detected Data	104
Number of Distinct Detected Data	95	Number of Non-Detect Data	45
		Percent Non-Detects	30.20%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.001	Minimum Detected	-6.908
Maximum Detected	0.0136	Maximum Detected	-4.298
Mean of Detected	0.0029	Mean of Detected	-6.075
SD of Detected	0.0027	SD of Detected	0.607
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.241	Lilliefors Test Statistic	0.127
5% Lilliefors Critical Value	0.0869	5% Lilliefors Critical Value	0.0869
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00217	Mean	-6.536
SD	0.00251	SD	0.866
95% DL/2 (t) UCL	0.00252	95% H-Stat (DL/2) UCL	0.0019
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00165	Mean in Log Scale	-6.506
SD	0.0031	SD in Log Scale	0.861
95% MLE (t) UCL	0.00207	Mean in Original Scale	0.0022
95% MLE (Tiku) UCL	0.00208	SD in Original Scale	0.00249
		95% Percentile Bootstrap UCL	0.00254
		95% BCA Bootstrap UCL	0.00259

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	2.249	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.00129		
nu star	467.7		
A-D Test Statistic	5.44	**Nonparametric Statistics**	
5% A-D Critical Value	0.763	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.763	Mean	0.00233
5% K-S Critical Value	0.0894	SD	0.00241

54	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.0001983
55											95% KM (t) UCL	0.00265
56	Assuming Gamma Distribution										95% KM (z) UCL	0.00265
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00265
58	Minimum	1E-09									95% KM (bootstrap t) UCL	0.00275
59	Maximum	0.0136									95% KM (BCA) UCL	0.0027
60	Mean	0.00244									95% KM (Percentile Bootstrap) UCL	0.00267
61	Median	0.00184									95% KM (Chebyshev) UCL	0.00319
62	SD	0.00242									97.5% KM (Chebyshev) UCL	0.00356
63	k star	0.671									99% KM (Chebyshev) UCL	0.0043
64	Theta star	0.00363										
65	Nu star	200									Potential UCLs to Use	
66	AppChi2	168.3									95% KM (BCA) UCL	0.0027
67	95% Gamma Approximate UCL	0.0029										
68	95% Adjusted Gamma UCL	0.0029										
69	Note: DL/2 is not a recommended method.											
70												
71												
72	Selenium, dissolved (cw-1d)											
73												
74	General Statistics											
75	Number of Valid Data	8									Number of Detected Data	3
76	Number of Distinct Detected Data	3									Number of Non-Detect Data	5
77											Percent Non-Detects	62.50%
78												
79	Raw Statistics										Log-transformed Statistics	
80	Minimum Detected	0.00217									Minimum Detected	-6.133
81	Maximum Detected	0.0052									Maximum Detected	-5.259
82	Mean of Detected	0.00324									Mean of Detected	-5.815
83	SD of Detected	0.0017									SD of Detected	0.483
84	Minimum Non-Detect	0.005									Minimum Non-Detect	-5.298
85	Maximum Non-Detect	0.01									Maximum Non-Detect	-4.605
86												
87	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
88	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
89	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
90												
91	Warning: There are only 3 Distinct Detected Values in this data set											
92	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
93	Those methods will return a 'N/A' value on your output display!											
94												
95	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
96	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
97												
98												
99	UCL Statistics											
100	Normal Distribution Test with Detected Values Only										Lognormal Distribution Test with Detected Values Only	
101	Shapiro Wilk Test Statistic	0.794									Shapiro Wilk Test Statistic	0.818
102	5% Shapiro Wilk Critical Value	0.767									5% Shapiro Wilk Critical Value	0.767
103	Data appear Normal at 5% Significance Level										Data appear Lognormal at 5% Significance Level	
104												
105	Assuming Normal Distribution										Assuming Lognormal Distribution	
106	DL/2 Substitution Method										DL/2 Substitution Method	

107					Mean	0.0034					Mean	-5.752
108					SD	0.00138					SD	0.39
109					95% DL/2 (t) UCL	0.00433					95% H-Stat (DL/2) UCL	0.0101
110												
111					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
112					**MLE method failed to converge properly**						Mean in Log Scale	-5.946
113											SD in Log Scale	0.334
114											Mean in Original Scale	0.00276
115											SD in Original Scale	0.00109
116											95% Percentile Bootstrap UCL	0.00344
117											95% BCA Bootstrap UCL	0.00363
118												
119					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
120					k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**	
121					Theta Star	N/A						
122					nu star	N/A						
123												
124					A-D Test Statistic	0.526					**Nonparametric Statistics**	
125					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
126					K-S Test Statistic	N/A					Mean	0.00275
127					5% K-S Critical Value	N/A					SD	0.0011
128					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0005517
129											95% KM (t) UCL	0.0038
130					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00366
131					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00372
132					Minimum	N/A					95% KM (bootstrap t) UCL	0.00931
133					Maximum	N/A					95% KM (BCA) UCL	0.0052
134					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0052
135					Median	N/A					95% KM (Chebyshev) UCL	0.00515
136					SD	N/A					97.5% KM (Chebyshev) UCL	0.0062
137					k star	N/A					99% KM (Chebyshev) UCL	0.00824
138					Theta star	N/A						
139					Nu star	N/A					**Potential UCLs to Use**	
140					AppChi2	N/A					95% KM (t) UCL	0.0038
141					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0052
142					95% Adjusted Gamma UCL	N/A						
143	**Note: DL/2 is not a recommended method.**											
144												
145												
146	**Selenium, dissolved (cw-1m)**											
147												
148							**General Statistics**					
149					Number of Valid Data	8					Number of Detected Data	2
150					Number of Distinct Detected Data	2					Number of Non-Detect Data	6
151											Percent Non-Detects	75.00%
152												
153					**Raw Statistics**						**Log-transformed Statistics**	
154					Minimum Detected	0.0016					Minimum Detected	-6.438
155					Maximum Detected	0.00193					Maximum Detected	-6.25
156					Mean of Detected	0.00177					Mean of Detected	-6.344
157					SD of Detected	0.0002334					SD of Detected	0.133
158					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
159					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605

160												
161	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	8
162	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
163	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
164												
165	**Warning: Data set has only 2 Distinct Detected Values.**											
166	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
167	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
168												
169	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
170												
171	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
172	**Those methods will return a 'N/A' value on your output display!**											
173												
174	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
175	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
176												
177												
178	**UCL Statistics**											
179	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
180	Shapiro Wilk Test Statistic				1		Shapiro Wilk Test Statistic					1
181	5% Shapiro Wilk Critical Value				N/A		5% Shapiro Wilk Critical Value					N/A
182	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
183												
184	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
185	DL/2 Substitution Method						DL/2 Substitution Method					
186	Mean				0.00269		Mean					-6.107
187	SD				0.00157		SD					0.728
188	95% DL/2 (t) UCL				0.00375		95% H-Stat (DL/2) UCL					0.0122
189												
190	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
191	**MLE method failed to converge properly**						Mean in Log Scale					N/A
192							SD in Log Scale					N/A
193							Mean in Original Scale					N/A
194							SD in Original Scale					N/A
195							95% Percentile Bootstrap UCL					N/A
196							95% BCA Bootstrap UCL					N/A
197												
198	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
199	k star (bias corrected)				N/A		**Data do not follow a Discernable Distribution (0.05)**					
200	Theta Star				N/A							
201	nu star				N/A							
202												
203	A-D Test Statistic				0.359		**Nonparametric Statistics**					
204	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
205	K-S Test Statistic				N/A		Mean					0.00171
206	5% K-S Critical Value				N/A		SD					0.0001556
207	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.000127
208							95% KM (t) UCL					0.00195
209	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00192
210	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.002
211	Minimum				N/A		95% KM (bootstrap t) UCL					1.8E+308
212	Maximum				N/A		95% KM (BCA) UCL					0.00193

213					Mean	N/A				95% KM (Percentile Bootstrap) UCL		0.00193
214					Median	N/A				95% KM (Chebyshev) UCL		0.00226
215					SD	N/A				97.5% KM (Chebyshev) UCL		0.0025
216					k star	N/A				99% KM (Chebyshev) UCL		0.00297
217					Theta star	N/A						
218					Nu star	N/A				**Potential UCLs to Use**		
219					AppChi2	N/A				95% KM (t) UCL		0.00195
220					95% Gamma Approximate UCL	N/A				95% KM (% Bootstrap) UCL		0.00193
221					95% Adjusted Gamma UCL	N/A						
222	**Warning: Recommended UCL exceeds the maximum observation**											
223	**Note: DL/2 is not a recommended method.**											
224												
225												
226	**Selenium, dissolved (cw-2d)**											
227												
228	**General Statistics**											
229					Number of Valid Data	8				Number of Detected Data		2
230					Number of Distinct Detected Data	2				Number of Non-Detect Data		6
231										Percent Non-Detects		75.00%
232												
233	**Raw Statistics**						**Log-transformed Statistics**					
234					Minimum Detected	0.002				Minimum Detected		-6.215
235					Maximum Detected	0.00229				Maximum Detected		-6.079
236					Mean of Detected	0.00215				Mean of Detected		-6.147
237					SD of Detected	0.0002051				SD of Detected		0.0957
238					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
239					Maximum Non-Detect	0.01				Maximum Non-Detect		-4.605
240												
241	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		8
242	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
243	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
244												
245	**Warning: Data set has only 2 Distinct Detected Values.**											
246	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
247	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
248												
249	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
250												
251	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
252	**Those methods will return a 'N/A' value on your output display!**											
253												
254	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
255	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
256												
257												
258	**UCL Statistics**											
259	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
260					Shapiro Wilk Test Statistic	1				Shapiro Wilk Test Statistic		1
261					5% Shapiro Wilk Critical Value	N/A				5% Shapiro Wilk Critical Value		N/A
262	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
263												
264	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
265					DL/2 Substitution Method					DL/2 Substitution Method		

266				Mean	0.00324					Mean	-5.794	
267				SD	0.00126					SD	0.371	
268				95% DL/2 (t) UCL	0.00409					95% H-Stat (DL/2) UCL	0.0115	
269												
270				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
271				**MLE method failed to converge properly**						Mean in Log Scale	N/A	
272										SD in Log Scale	N/A	
273										Mean in Original Scale	N/A	
274										SD in Original Scale	N/A	
275										95% Percentile Bootstrap UCL	N/A	
276										95% BCA Bootstrap UCL	N/A	
277												
278				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
279				k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**		
280				Theta Star	N/A							
281				nu star	N/A							
282												
283				A-D Test Statistic	0.359					**Nonparametric Statistics**		
284				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
285				K-S Test Statistic	N/A					Mean	0.00215	
286				5% K-S Critical Value	N/A					SD	0.000145	
287				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.000145	
288										95% KM (t) UCL	0.00242	
289				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00238	
290				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00251	
291				Minimum	N/A					95% KM (bootstrap t) UCL	0.00244	
292				Maximum	N/A					95% KM (BCA) UCL	0.00229	
293				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
294				Median	N/A					95% KM (Chebyshev) UCL	0.00278	
295				SD	N/A					97.5% KM (Chebyshev) UCL	0.00305	
296				k star	N/A					99% KM (Chebyshev) UCL	0.00359	
297				Theta star	N/A							
298				Nu star	N/A					**Potential UCLs to Use**		
299				AppChi2	N/A					95% KM (t) UCL	0.00242	
300				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A	
301				95% Adjusted Gamma UCL	N/A							
302				**Warning: Recommended UCL exceeds the maximum observation**								
303	**Note: DL/2 is not a recommended method.**											
304												
305												
306	**Selenium, dissolved (cw-2m)**											
307												
308				**General Statistics**								
309				Number of Valid Data	8					Number of Detected Data	0	
310				Number of Distinct Detected Data	0					Number of Non-Detect Data	8	
311										Percent Non-Detects	100.00%	
312												
313				**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**								
314				**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**								
315				**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**								
316												
317				**The data set for variable Selenium, dissolved (cw-2m) was not processed!**								
318												

319												
320												
321	**Selenium, dissolved (cw-3d)**											
322												
323					**General Statistics**							
324				Number of Valid Data	8			Number of Detected Data	1			
325				Number of Distinct Detected Data	1			Number of Non-Detect Data	7			
326								Percent Non-Detects	87.50%			
327												
328	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
329	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
330												
331	**The data set for variable Selenium, dissolved (cw-3d) was not processed!**											
332												
333												
334												
335	**Selenium, dissolved (cw-3m)**											
336												
337					**General Statistics**							
338				Number of Valid Data	8			Number of Detected Data	0			
339				Number of Distinct Detected Data	0			Number of Non-Detect Data	8			
340								Percent Non-Detects	100.00%			
341												
342	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
343	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
344	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
345												
346	**The data set for variable Selenium, dissolved (cw-3m) was not processed!**											
347												
348												
349												
350	**Selenium, dissolved (cw-4d)**											
351												
352					**General Statistics**							
353				Number of Valid Data	8			Number of Detected Data	2			
354				Number of Distinct Detected Data	2			Number of Non-Detect Data	6			
355								Percent Non-Detects	75.00%			
356												
357				**Raw Statistics**				**Log-transformed Statistics**				
358				Minimum Detected	0.00134			Minimum Detected	-6.615			
359				Maximum Detected	0.0053			Maximum Detected	-5.24			
360				Mean of Detected	0.00332			Mean of Detected	-5.928			
361				SD of Detected	0.0028			SD of Detected	0.972			
362				Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908			
363				Maximum Non-Detect	0.01			Maximum Non-Detect	-4.605			
364												
365	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect	8			
366	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected	0			
367	Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	100.00%			
368												
369	**Warning: Data set has only 2 Distinct Detected Values.**											
370	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
371	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											

372												
373	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
374												
375	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
376	**Those methods will return a 'N/A' value on your output display!**											
377												
378	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
379	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
380												
381												
382	**UCL Statistics**											
383	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
384	Shapiro Wilk Test Statistic				1		Shapiro Wilk Test Statistic					1
385	5% Shapiro Wilk Critical Value				N/A		5% Shapiro Wilk Critical Value					N/A
386	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
387												
388	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
389	DL/2 Substitution Method						DL/2 Substitution Method					
390	Mean				0.00308		Mean					-6.003
391	SD				0.00181		SD					0.802
392	95% DL/2 (t) UCL				0.00429		95% H-Stat (DL/2) UCL					0.0156
393												
394	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
395	**MLE method failed to converge properly**						Mean in Log Scale					N/A
396							SD in Log Scale					N/A
397							Mean in Original Scale					N/A
398							SD in Original Scale					N/A
399							95% Percentile Bootstrap UCL					N/A
400							95% BCA Bootstrap UCL					N/A
401												
402	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
403	k star (bias corrected)				N/A		**Data do not follow a Discernable Distribution (0.05)**					
404	Theta Star				N/A							
405	nu star				N/A							
406												
407	A-D Test Statistic				0.359		**Nonparametric Statistics**					
408	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
409	K-S Test Statistic				N/A		Mean					0.002
410	5% K-S Critical Value				N/A		SD					0.00148
411	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0008521
412							95% KM (t) UCL					0.00361
413	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0034
414	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00487
415	Minimum				N/A		95% KM (bootstrap t) UCL					1.8E+308
416	Maximum				N/A		95% KM (BCA) UCL					N/A
417	Mean				N/A		95% KM (Percentile Bootstrap) UCL					0.0053
418	Median				N/A		95% KM (Chebyshev) UCL					0.00571
419	SD				N/A		97.5% KM (Chebyshev) UCL					0.00732
420	k star				N/A		99% KM (Chebyshev) UCL					0.0105
421	Theta star				N/A							
422	Nu star				N/A		**Potential UCLs to Use**					
423	AppChi2				N/A		95% KM (t) UCL					0.00361
424	95% Gamma Approximate UCL				N/A		95% KM (% Bootstrap) UCL					0.0053

425					95% Adjusted Gamma UCL	N/A						
426	**Note: DL/2 is not a recommended method.**											
427												
428												
429	**Selenium, dissolved (cw-4m)**											
430												
431	**General Statistics**											
432					Number of Valid Data	8				Number of Detected Data	2	
433					Number of Distinct Detected Data	2				Number of Non-Detect Data	6	
434										Percent Non-Detects	75.00%	
435												
436	**Raw Statistics**						**Log-transformed Statistics**					
437					Minimum Detected	0.00104				Minimum Detected	-6.869	
438					Maximum Detected	0.0011				Maximum Detected	-6.812	
439					Mean of Detected	0.00107				Mean of Detected	-6.84	
440					SD of Detected	4.243E-05				SD of Detected	0.0397	
441					Minimum Non-Detect	0.005				Minimum Non-Detect	-5.298	
442					Maximum Non-Detect	0.01				Maximum Non-Detect	-4.605	
443												
444	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	8	
445	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
446	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
447												
448	**Warning: Data set has only 2 Distinct Detected Values.**											
449	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
450	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
451												
452	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
453												
454	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
455	**Those methods will return a 'N/A' value on your output display!**											
456												
457	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
458	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
459												
460												
461	**UCL Statistics**											
462	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
463					Shapiro Wilk Test Statistic	1				Shapiro Wilk Test Statistic	1	
464					5% Shapiro Wilk Critical Value	N/A				5% Shapiro Wilk Critical Value	N/A	
465	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
466												
467	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
468					DL/2 Substitution Method					DL/2 Substitution Method		
469					Mean	0.00277				Mean	-6.03	
470					SD	0.00151				SD	0.585	
471					95% DL/2 (t) UCL	0.00378				95% H-Stat (DL/2) UCL	0.0101	
472												
473					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
474	**MLE method failed to converge properly**									Mean in Log Scale	N/A	
475										SD in Log Scale	N/A	
476										Mean in Original Scale	N/A	
477										SD in Original Scale	N/A	

478											95% Percentile Bootstrap UCL	N/A
479											95% BCA Bootstrap UCL	N/A
480												
481	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
482					k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**					
483					Theta Star	N/A						
484					nu star	N/A						
485												
486					A-D Test Statistic	0.359	**Nonparametric Statistics**					
487					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
488					K-S Test Statistic	N/A					Mean	0.00107
489					5% K-S Critical Value	N/A					SD	0.00003
490	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00003
491											95% KM (t) UCL	0.00113
492	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00112
493					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00115
494					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
495					Maximum	N/A					95% KM (BCA) UCL	N/A
496					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0011
497					Median	N/A					95% KM (Chebyshev) UCL	0.0012
498					SD	N/A					97.5% KM (Chebyshev) UCL	0.00126
499					k star	N/A					99% KM (Chebyshev) UCL	0.00137
500					Theta star	N/A						
501					Nu star	N/A	**Potential UCLs to Use**					
502					AppChi2	N/A					95% KM (t) UCL	0.00113
503					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.0011
504					95% Adjusted Gamma UCL	N/A						
505	**Warning: Recommended UCL exceeds the maximum observation**											
506	**Note: DL/2 is not a recommended method.**											
507												
508												
509	**Selenium, dissolved (mw-1)**											
510												
511	**General Statistics**											
512					Number of Valid Observations	2					Number of Distinct Observations	2
513												
514												
515	**Warning: This data set only has 2 observations!**											
516	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
517	**The data set for variable Selenium, dissolved (mw-1) was not processed!**											
518												
519	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
520	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
521												
522												
523												
524	**Selenium, dissolved (mw-10)**											
525												
526	**General Statistics**											
527					Number of Valid Data	14					Number of Detected Data	10
528					Number of Distinct Detected Data	9					Number of Non-Detect Data	4
529											Percent Non-Detects	28.57%
530												

	A	B	C	D	E	F	G	H	I	J	K	L
531	**Raw Statistics**						**Log-transformed Statistics**					
532					Minimum Detected	0.00193					Minimum Detected	-6.25
533					Maximum Detected	0.02					Maximum Detected	-3.912
534					Mean of Detected	0.0055					Mean of Detected	-5.415
535					SD of Detected	0.00517					SD of Detected	0.596
536					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
537					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
538												
539	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
540	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
541	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	92.86%
542												
543	**UCL Statistics**											
544	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
545					Shapiro Wilk Test Statistic	0.538					Shapiro Wilk Test Statistic	0.789
546					5% Shapiro Wilk Critical Value	0.842					5% Shapiro Wilk Critical Value	0.842
547	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
548												
549	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
550					DL/2 Substitution Method						DL/2 Substitution Method	
551					Mean	0.00518					Mean	-5.431
552					SD	0.00438					SD	0.523
553					95% DL/2 (t) UCL	0.00725					95% H-Stat (DL/2) UCL	0.0112
554												
555					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
556	**MLE method failed to converge properly**										Mean in Log Scale	-5.451
557											SD in Log Scale	0.517
558											Mean in Original Scale	0.00509
559											SD in Original Scale	0.00439
560											95% Percentile Bootstrap UCL	0.00736
561											95% BCA Bootstrap UCL	0.00852
562												
563	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
564					k star (bias corrected)	1.818	**Data do not follow a Discernable Distribution (0.05)**					
565					Theta Star	0.00303						
566					nu star	36.37						
567												
568					A-D Test Statistic	1.378	**Nonparametric Statistics**					
569					5% A-D Critical Value	0.734					Kaplan-Meier (KM) Method	
570					K-S Test Statistic	0.734					Mean	0.00503
571					5% K-S Critical Value	0.269					SD	0.00424
572	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00121
573											95% KM (t) UCL	0.00716
574	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00701
575					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00714
576					Minimum	0.00193					95% KM (bootstrap t) UCL	0.0118
577					Maximum	0.02					95% KM (BCA) UCL	0.00752
578					Mean	0.00551					95% KM (Percentile Bootstrap) UCL	0.00729
579					Median	0.0043					95% KM (Chebyshev) UCL	0.0103
580					SD	0.00447					97.5% KM (Chebyshev) UCL	0.0126
581					k star	2.373					99% KM (Chebyshev) UCL	0.017
582					Theta star	0.00232						
583					Nu star	66.44	**Potential UCLs to Use**					

584					AppChi2	48.68					95% KM (BCA) UCL	0.00752
585					95% Gamma Approximate UCL	0.00752						
586					95% Adjusted Gamma UCL	0.00785						
587	**Note: DL/2 is not a recommended method.**											
588												
589												
590	**Selenium, dissolved (mw-11)**											
591												
592	**General Statistics**											
593					Number of Valid Data	10					Number of Detected Data	7
594					Number of Distinct Detected Data	7					Number of Non-Detect Data	3
595											Percent Non-Detects	30.00%
596												
597	**Raw Statistics**						**Log-transformed Statistics**					
598					Minimum Detected	0.0045					Minimum Detected	-5.404
599					Maximum Detected	0.0136					Maximum Detected	-4.298
600					Mean of Detected	0.00669					Mean of Detected	-5.072
601					SD of Detected	0.00309					SD of Detected	0.356
602					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
603					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
604												
605	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	9
606	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
607	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	90.00%
608												
609	**Warning: There are only 7 Detected Values in this data**											
610	**Note: It should be noted that even though bootstrap may be performed on this data set**											
611	**the resulting calculations may not be reliable enough tp draw conclusions**											
612												
613	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
614												
615												
616	**UCL Statistics**											
617	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
618					Shapiro Wilk Test Statistic	0.615					Shapiro Wilk Test Statistic	0.714
619					5% Shapiro Wilk Critical Value	0.803					5% Shapiro Wilk Critical Value	0.803
620	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
621												
622	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
623					DL/2 Substitution Method						DL/2 Substitution Method	
624					Mean	0.00593					Mean	-5.209
625					SD	0.00289					SD	0.411
626					95% DL/2 (t) UCL	0.0076					95% H-Stat (DL/2) UCL	0.0101
627												
628					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
629	**MLE method failed to converge properly**										Mean in Log Scale	-5.146
630											SD in Log Scale	0.334
631											Mean in Original Scale	0.00618
632											SD in Original Scale	0.00271
633											95% Percentile Bootstrap UCL	0.00769
634											95% BCA Bootstrap UCL	0.00832
635												
636	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					

637				k star (bias corrected)	4.596	**Data do not follow a Discernable Distribution (0.05)**						
638				Theta Star	0.00146							
639				nu star	64.34							
640												
641				A-D Test Statistic	1.182	**Nonparametric Statistics**						
642				5% A-D Critical Value	0.709	Kaplan-Meier (KM) Method						
643				K-S Test Statistic	0.709	Mean	0.00621					
644				5% K-S Critical Value	0.312	SD	0.00253					
645	**Data not Gamma Distributed at 5% Significance Level**					SE of Mean	0.0008706					
646						95% KM (t) UCL	0.0078					
647	**Assuming Gamma Distribution**					95% KM (z) UCL	0.00764					
648	Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.00772					
649				Minimum	0.00411	95% KM (bootstrap t) UCL	0.0112					
650				Maximum	0.0136	95% KM (BCA) UCL	0.00814					
651				Mean	0.00647	95% KM (Percentile Bootstrap) UCL	0.00793					
652				Median	0.00576	95% KM (Chebyshev) UCL	0.01					
653				SD	0.0027	97.5% KM (Chebyshev) UCL	0.0116					
654				k star	6.306	99% KM (Chebyshev) UCL	0.0149					
655				Theta star	0.00103							
656				Nu star	126.1	**Potential UCLs to Use**						
657				AppChi2	101.2	95% KM (BCA) UCL	0.00814					
658				95% Gamma Approximate UCL	0.00807							
659				95% Adjusted Gamma UCL	0.00839							
660	**Note: DL/2 is not a recommended method.**											
661												
662												
663	**Selenium, dissolved (mw-12)**											
664												
665	**General Statistics**											
666				Number of Valid Data	17	Number of Detected Data	11					
667				Number of Distinct Detected Data	11	Number of Non-Detect Data	6					
668						Percent Non-Detects	35.29%					
669												
670	**Raw Statistics**					**Log-transformed Statistics**						
671				Minimum Detected	0.00406	Minimum Detected	-5.507					
672				Maximum Detected	0.008	Maximum Detected	-4.828					
673				Mean of Detected	0.00553	Mean of Detected	-5.218					
674				SD of Detected	0.00116	SD of Detected	0.205					
675				Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298					
676				Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605					
677												
678	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect	17					
679	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected	0					
680	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage	100.00%					
681												
682	**UCL Statistics**											
683	**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**						
684				Shapiro Wilk Test Statistic	0.921	Shapiro Wilk Test Statistic	0.939					
685				5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85					
686	**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**						
687												
688	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
689				DL/2 Substitution Method		DL/2 Substitution Method						

690					Mean	0.00519					Mean	-5.287
691					SD	0.00118					SD	0.246
692					95% DL/2 (t) UCL	0.00569					95% H-Stat (DL/2) UCL	0.00816
693												
694					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
695					**MLE method failed to converge properly**						Mean in Log Scale	-5.235
696											SD in Log Scale	0.19
697											Mean in Original Scale	0.00542
698											SD in Original Scale	0.00106
699											95% Percentile Bootstrap UCL	0.00584
700											95% BCA Bootstrap UCL	0.00587
701												
702					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
703					k star (bias corrected)	18.94					**Data appear Normal at 5% Significance Level**	
704					Theta Star	0.0002918						
705					nu star	416.6						
706												
707					A-D Test Statistic	0.392					**Nonparametric Statistics**	
708					5% A-D Critical Value	0.729					Kaplan-Meier (KM) Method	
709					K-S Test Statistic	0.729					Mean	0.00543
710					5% K-S Critical Value	0.255					SD	0.00111
711					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0003369
712											95% KM (t) UCL	0.00601
713					**Assuming Gamma Distribution**						95% KM (z) UCL	0.00598
714					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00602
715					Minimum	0.00406					95% KM (bootstrap t) UCL	0.00618
716					Maximum	0.008					95% KM (BCA) UCL	0.00602
717					Mean	0.00553					95% KM (Percentile Bootstrap) UCL	0.00597
718					Median	0.00572					95% KM (Chebyshev) UCL	0.00689
719					SD	0.00104					97.5% KM (Chebyshev) UCL	0.00753
720					k star	25.28					99% KM (Chebyshev) UCL	0.00878
721					Theta star	0.0002188						
722					Nu star	859.5					**Potential UCLs to Use**	
723					AppChi2	792.4					95% KM (t) UCL	0.00601
724					95% Gamma Approximate UCL	0.006					95% KM (Percentile Bootstrap) UCL	0.00597
725					95% Adjusted Gamma UCL	0.00605						
726	**Note: DL/2 is not a recommended method.**											
727												
728												
729	**Selenium, dissolved (mw-13)**											
730												
731						**General Statistics**							
732					Number of Valid Data	2					Number of Detected Data	1
733					Number of Distinct Detected Data	1					Number of Non-Detect Data	1
734											Percent Non-Detects	50.00%
735												
736	**Warning: This data set only has 2 observations!**											
737	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
738	**The data set for variable Selenium, dissolved (mw-13) was not processed!**											
739												
740	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
741	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
742												

	A	B	C	D	E	F	G	H	I	J	K	L
743												
744												
745	**Selenium, dissolved (mw-14)**											
746												
747	**General Statistics**											
748	Number of Valid Observations					2	Number of Distinct Observations					2
749												
750												
751	**Warning: This data set only has 2 observations!**											
752	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
753	**The data set for variable Selenium, dissolved (mw-14) was not processed!**											
754												
755	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
756	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
757												
758												
759												
760	**Selenium, dissolved (mw-15)**											
761												
762	**General Statistics**											
763	Number of Valid Observations					1	Number of Distinct Observations					1
764												
765												
766	**Warning: This data set only has 1 observations!**											
767	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
768	**The data set for variable Selenium, dissolved (mw-15) was not processed!**											
769												
770	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
771	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
772												
773												
774												
775	**Selenium, dissolved (mw-19)**											
776												
777	**General Statistics**											
778	Number of Valid Observations					1	Number of Distinct Observations					1
779												
780												
781	**Warning: This data set only has 1 observations!**											
782	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
783	**The data set for variable Selenium, dissolved (mw-19) was not processed!**											
784												
785	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
786	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
787												
788												
789												
790	**Selenium, dissolved (mw-20-100)**											
791												
792	**General Statistics**											
793	Number of Valid Data					1	Number of Detected Data					0
794	Number of Distinct Detected Data					0	Number of Non-Detect Data					1
795							Percent Non-Detects					100.00%

796												
797	**Warning: This data set only has 1 observations!**											
798	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
799	**The data set for variable Selenium, dissolved (mw-20-100) was not processed!**											
800												
801	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
802	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
803												
804												
805												
806	**Selenium, dissolved (mw-20-130)**											
807												
808	**General Statistics**											
809					Number of Valid Data	12			Number of Detected Data	11		
810					Number of Distinct Detected Data	11			Number of Non-Detect Data	1		
811									Percent Non-Detects	8.33%		
812												
813	**Raw Statistics**						**Log-transformed Statistics**					
814					Minimum Detected	0.0107			Minimum Detected	-4.538		
815					Maximum Detected	0.023			Maximum Detected	-3.772		
816					Mean of Detected	0.0142			Mean of Detected	-4.282		
817					SD of Detected	0.0037			SD of Detected	0.234		
818					Minimum Non-Detect	0.01			Minimum Non-Detect	-4.605		
819					Maximum Non-Detect	0.01			Maximum Non-Detect	-4.605		
820												
821												
822	**UCL Statistics**											
823	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
824					Shapiro Wilk Test Statistic	0.837			Shapiro Wilk Test Statistic	0.9		
825					5% Shapiro Wilk Critical Value	0.85			5% Shapiro Wilk Critical Value	0.85		
826	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
827												
828	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
829					DL/2 Substitution Method				DL/2 Substitution Method			
830					Mean	0.0134			Mean	-4.366		
831					SD	0.00441			SD	0.368		
832					95% DL/2 (t) UCL	0.0157			95% H-Stat (DL/2) UCL	0.0167		
833												
834					Maximum Likelihood Estimate(MLE) Method				Log ROS Method			
835					Mean	0.0137			Mean in Log Scale	-4.328		
836					SD	0.00382			SD in Log Scale	0.275		
837					95% MLE (t) UCL	0.0157			Mean in Original Scale	0.0137		
838					95% MLE (Tiku) UCL	0.0156			SD in Original Scale	0.00397		
839									95% Percentile Bootstrap UCL	0.0155		
840									95% BCA Bootstrap UCL	0.016		
841												
842	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
843					k star (bias corrected)	13.84	**Data appear Gamma Distributed at 5% Significance Level**					
844					Theta Star	0.00103						
845					nu star	304.5						
846												
847					A-D Test Statistic	0.553	**Nonparametric Statistics**					
848					5% A-D Critical Value	0.729			Kaplan-Meier (KM) Method			

849				K-S Test Statistic	0.729					Mean	0.0139	
850				5% K-S Critical Value	0.255					SD	0.00351	
851				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00106	
852										95% KM (t) UCL	0.0158	
853				**Assuming Gamma Distribution**						95% KM (z) UCL	0.0156	
854				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0158	
855				Minimum	0.00789					95% KM (bootstrap t) UCL	0.0172	
856				Maximum	0.023					95% KM (BCA) UCL	0.0158	
857				Mean	0.0137					95% KM (Percentile Bootstrap) UCL	0.0156	
858				Median	0.0129					95% KM (Chebyshev) UCL	0.0185	
859				SD	0.00397					97.5% KM (Chebyshev) UCL	0.0205	
860				k star	10.71					99% KM (Chebyshev) UCL	0.0245	
861				Theta star	0.00128							
862				Nu star	256.9					**Potential UCLs to Use**		
863				AppChi2	220.8					95% KM (BCA) UCL	0.0158	
864				95% Gamma Approximate UCL	0.0159							
865				95% Adjusted Gamma UCL	0.0163							
866	**Note: DL/2 is not a recommended method.**											
867												
868												
869	**Selenium, dissolved (mw-20-70)**											
870												
871					**General Statistics**							
872				Number of Valid Data	13					Number of Detected Data	9	
873				Number of Distinct Detected Data	8					Number of Non-Detect Data	4	
874										Percent Non-Detects	30.77%	
875												
876				**Raw Statistics**						**Log-transformed Statistics**		
877				Minimum Detected	0.00783					Minimum Detected	-4.85	
878				Maximum Detected	0.0181					Maximum Detected	-4.012	
879				Mean of Detected	0.0111					Mean of Detected	-4.528	
880				SD of Detected	0.00298					SD of Detected	0.241	
881				Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298	
882				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
883												
884	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	7	
885	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	6	
886	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	53.85%	
887												
888	**Warning: There are only 9 Detected Values in this data**											
889	**Note: It should be noted that even though bootstrap may be performed on this data set**											
890	**the resulting calculations may not be reliable enough tp draw conclusions**											
891												
892	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
893												
894												
895					**UCL Statistics**							
896				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
897				Shapiro Wilk Test Statistic	0.835					Shapiro Wilk Test Statistic	0.92	
898				5% Shapiro Wilk Critical Value	0.829					5% Shapiro Wilk Critical Value	0.829	
899				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
900												
901				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		

902				DL/2 Substitution Method							DL/2 Substitution Method	
903				Mean	0.00903						Mean	-4.819
904				SD	0.00409						SD	0.523
905				95% DL/2 (t) UCL	0.0111						95% H-Stat (DL/2) UCL	0.0106
906												
907				Maximum Likelihood Estimate(MLE) Method							Log ROS Method	
908				Mean	0.00933						Mean in Log Scale	-4.649
909				SD	0.00375						SD in Log Scale	0.285
910				95% MLE (t) UCL	0.0112						Mean in Original Scale	0.00996
911				95% MLE (Tiku) UCL	0.0117						SD in Original Scale	0.00308
912											95% Percentile Bootstrap UCL	0.0114
913											95% BCA Bootstrap UCL	0.0116
914												
915				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
916				k star (bias corrected)	12.29						**Data appear Normal at 5% Significance Level**	
917				Theta Star	0.0009033							
918				nu star	221.2							
919												
920				A-D Test Statistic	0.439						**Nonparametric Statistics**	
921				5% A-D Critical Value	0.721						Kaplan-Meier (KM) Method	
922				K-S Test Statistic	0.721						Mean	0.0102
923				5% K-S Critical Value	0.279						SD	0.0027
924				**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean	0.0008015
925											95% KM (t) UCL	0.0117
926				**Assuming Gamma Distribution**							95% KM (z) UCL	0.0115
927				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.0116
928				Minimum	0.00735						95% KM (bootstrap t) UCL	0.0126
929				Maximum	0.0181						95% KM (BCA) UCL	0.012
930				Mean	0.0107						95% KM (Percentile Bootstrap) UCL	0.0118
931				Median	0.0107						95% KM (Chebyshev) UCL	0.0137
932				SD	0.00272						97.5% KM (Chebyshev) UCL	0.0152
933				k star	14.94						99% KM (Chebyshev) UCL	0.0182
934				Theta star	0.0007146							
935				Nu star	388.6						**Potential UCLs to Use**	
936				AppChi2	343.9						95% KM (t) UCL	0.0117
937				95% Gamma Approximate UCL	0.0121						95% KM (Percentile Bootstrap) UCL	0.0118
938				95% Adjusted Gamma UCL	0.0123							
939	**Note: DL/2 is not a recommended method.**											
940												
941												
942	**Selenium, dissolved (mw-21)**											
943												
944						**General Statistics**						
945				Number of Valid Observations	4						Number of Distinct Observations	4
946												
947												
948						**Warning: This data set only has 4 observations!**							
949						**Data set is too small to compute reliable and meaningful statistics and estimates!**							
950						**The data set for variable Selenium, dissolved (mw-21) was not processed!**							
951												
952						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
953						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
954												

	A	B	C	D	E	F	G	H	I	J	K	L
955												
956												
957	**Selenium, dissolved (mw-22)**											
958												
959	**General Statistics**											
960	Number of Valid Data					3	Number of Detected Data					0
961	Number of Distinct Detected Data					0	Number of Non-Detect Data					3
962							Percent Non-Detects					100.00%
963												
964	**Warning: This data set only has 3 observations!**											
965	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
966	**The data set for variable Selenium, dissolved (mw-22) was not processed!**											
967												
968	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
969	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
970												
971												
972												
973	**Selenium, dissolved (mw-23)**											
974												
975	**General Statistics**											
976	Number of Valid Observations				4		Number of Distinct Observations					4
977												
978												
979	**Warning: This data set only has 4 observations!**											
980	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
981	**The data set for variable Selenium, dissolved (mw-23) was not processed!**											
982												
983	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
984	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
985												
986												
987												
988	**Selenium, dissolved (mw-24a)**											
989												
990	**General Statistics**											
991	Number of Valid Data					3	Number of Detected Data					2
992	Number of Distinct Detected Data					2	Number of Non-Detect Data					1
993							Percent Non-Detects					33.33%
994												
995	**Warning: This data set only has 3 observations!**											
996	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
997	**The data set for variable Selenium, dissolved (mw-24a) was not processed!**											
998												
999	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1000	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1001												
1002												
1003												
1004	**Selenium, dissolved (mw-24b)**											
1005												
1006	**General Statistics**											
1007	Number of Valid Observations				1		Number of Distinct Observations					1

1008												
1009												
1010	**Warning: This data set only has 1 observations!**											
1011	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1012	**The data set for variable Selenium, dissolved (mw-24b) was not processed!**											
1013												
1014	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1015	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1016												
1017												
1018												
1019	**Selenium, dissolved (mw-25)**											
1020												
1021	**General Statistics**											
1022					Number of Valid Data	10			Number of Detected Data	7		
1023					Number of Distinct Detected Data	6			Number of Non-Detect Data	3		
1024									Percent Non-Detects	30.00%		
1025												
1026	**Raw Statistics**						**Log-transformed Statistics**					
1027					Minimum Detected	0.00204			Minimum Detected	-6.195		
1028					Maximum Detected	0.0131			Maximum Detected	-4.335		
1029					Mean of Detected	0.00395			Mean of Detected	-5.786		
1030					SD of Detected	0.00404			SD of Detected	0.646		
1031					Minimum Non-Detect	0.005			Minimum Non-Detect	-5.298		
1032					Maximum Non-Detect	0.01			Maximum Non-Detect	-4.605		
1033												
1034	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	9		
1035	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	1		
1036	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	90.00%		
1037												
1038	**Warning: There are only 7 Detected Values in this data**											
1039	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1040	**the resulting calculations may not be reliable enough tp draw conclusions**											
1041												
1042	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1043												
1044												
1045	**UCL Statistics**											
1046	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1047					Shapiro Wilk Test Statistic	0.505			Shapiro Wilk Test Statistic	0.589		
1048					5% Shapiro Wilk Critical Value	0.803			5% Shapiro Wilk Critical Value	0.803		
1049	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1050												
1051	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1052					DL/2 Substitution Method				DL/2 Substitution Method			
1053					Mean	0.00401			Mean	-5.709		
1054					SD	0.00337			SD	0.574		
1055					95% DL/2 (t) UCL	0.00597			95% H-Stat (DL/2) UCL	0.0132		
1056												
1057					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
1058	**MLE method failed to converge properly**								Mean in Log Scale	-5.826		
1059									SD in Log Scale	0.542		
1060									Mean in Original Scale	0.00358		

1061											SD in Original Scale	0.00336
1062											95% Percentile Bootstrap UCL	0.00566
1063											95% BCA Bootstrap UCL	0.00674
1064												
1065	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1066					k star (bias corrected)	1.32	**Data do not follow a Discernable Distribution (0.05)**					
1067					Theta Star	0.00299						
1068					nu star	18.48						
1069												
1070					A-D Test Statistic	1.663	**Nonparametric Statistics**					
1071					5% A-D Critical Value	0.715					Kaplan-Meier (KM) Method	
1072					K-S Test Statistic	0.715					Mean	0.00349
1073					5% K-S Critical Value	0.315					SD	0.00321
1074	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0011
1075											95% KM (t) UCL	0.0055
1076	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00529
1077					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00545
1078					Minimum	0.00204					95% KM (bootstrap t) UCL	0.0235
1079					Maximum	0.0131					95% KM (BCA) UCL	0.00569
1080					Mean	0.00395					95% KM (Percentile Bootstrap) UCL	0.00558
1081					Median	0.00268					95% KM (Chebyshev) UCL	0.00827
1082					SD	0.0033					97.5% KM (Chebyshev) UCL	0.0103
1083					k star	2.166					99% KM (Chebyshev) UCL	0.0144
1084					Theta star	0.00182						
1085					Nu star	43.32	**Potential UCLs to Use**					
1086					AppChi2	29.22					95% KM (BCA) UCL	0.00569
1087					95% Gamma Approximate UCL	0.00585						
1088					95% Adjusted Gamma UCL	0.00628						
1089	**Note: DL/2 is not a recommended method.**											
1090												
1091												
1092	**Selenium, dissolved (mw-26)**											
1093												
1094	**General Statistics**											
1095					Number of Valid Observations	3					Number of Distinct Observations	3
1096												
1097												
1098	**Warning: This data set only has 3 observations!**											
1099	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1100	**The data set for variable Selenium, dissolved (mw-26) was not processed!**											
1101												
1102	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1103	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1104												
1105												
1106												
1107	**Selenium, dissolved (mw-3)**											
1108												
1109	**General Statistics**											
1110					Number of Valid Observations	2					Number of Distinct Observations	2
1111												
1112												
1113	**Warning: This data set only has 2 observations!**											

	A	B	C	D	E	F	G	H	I	J	K	L
1114	Data set is too small to compute reliable and meaningful statistics and estimates!											
1115	The data set for variable Selenium, dissolved (mw-3) was not processed!											
1116												
1117	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1118	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1119												
1120												
1121												
1122	Selenium, dissolved (mw-30-30)											
1123												
1124	General Statistics											
1125						Number of Valid Data	1			Number of Detected Data	0	
1126						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
1127										Percent Non-Detects	100.00%	
1128												
1129	Warning: This data set only has 1 observations!											
1130	Data set is too small to compute reliable and meaningful statistics and estimates!											
1131	The data set for variable Selenium, dissolved (mw-30-30) was not processed!											
1132												
1133	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1134	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1135												
1136												
1137												
1138	Selenium, dissolved (mw-31-135)											
1139												
1140	General Statistics											
1141						Number of Valid Data	1			Number of Detected Data	0	
1142						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
1143										Percent Non-Detects	100.00%	
1144												
1145	Warning: This data set only has 1 observations!											
1146	Data set is too small to compute reliable and meaningful statistics and estimates!											
1147	The data set for variable Selenium, dissolved (mw-31-135) was not processed!											
1148												
1149	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1150	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1151												
1152												
1153												
1154	Selenium, dissolved (mw-31-60)											
1155												
1156	General Statistics											
1157						Number of Valid Data	2			Number of Detected Data	1	
1158						Number of Distinct Detected Data	1			Number of Non-Detect Data	1	
1159										Percent Non-Detects	50.00%	
1160												
1161	Warning: This data set only has 2 observations!											
1162	Data set is too small to compute reliable and meaningful statistics and estimates!											
1163	The data set for variable Selenium, dissolved (mw-31-60) was not processed!											
1164												
1165	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1166	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											

	A	B	C	D	E	F	G	H	I	J	K	L
1167												
1168												
1169												
1170	**Selenium, dissolved (mw-32-35)**											
1171												
1172	**General Statistics**											
1173					Number of Valid Data	3			Number of Detected Data			1
1174					Number of Distinct Detected Data	1			Number of Non-Detect Data			2
1175									Percent Non-Detects			66.67%
1176												
1177	**Warning: This data set only has 3 observations!**											
1178	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1179	**The data set for variable Selenium, dissolved (mw-32-35) was not processed!**											
1180												
1181	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1182	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1183												
1184												
1185												
1186	**Selenium, dissolved (mw-33-210)**											
1187												
1188	**General Statistics**											
1189					Number of Valid Data	1			Number of Detected Data			0
1190					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
1191									Percent Non-Detects			100.00%
1192												
1193	**Warning: This data set only has 1 observations!**											
1194	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1195	**The data set for variable Selenium, dissolved (mw-33-210) was not processed!**											
1196												
1197	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1198	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1199												
1200												
1201												
1202	**Selenium, dissolved (mw-33-90)**											
1203												
1204	**General Statistics**											
1205					Number of Valid Observations	1			Number of Distinct Observations			1
1206												
1207												
1208	**Warning: This data set only has 1 observations!**											
1209	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1210	**The data set for variable Selenium, dissolved (mw-33-90) was not processed!**											
1211												
1212	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1213	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1214												
1215												
1216												
1217	**Selenium, dissolved (mw-34-100)**											
1218												
1219	**General Statistics**											

1220					Number of Valid Data	2				Number of Detected Data		0
1221					Number of Distinct Detected Data	0				Number of Non-Detect Data		2
1222										Percent Non-Detects		100.00%
1223												
1224												
1225												
1226												
1227												
1228												
1229												
1230												
1231												
1232												
1233												
1234												
1235												
1236					Number of Valid Data	9				Number of Detected Data		1
1237					Number of Distinct Detected Data	1				Number of Non-Detect Data		8
1238										Percent Non-Detects		88.89%
1239												
1240												
1241												
1242												
1243												
1244												
1245												
1246												
1247												
1248												
1249												
1250					Number of Valid Data	13				Number of Detected Data		0
1251					Number of Distinct Detected Data	0				Number of Non-Detect Data		13
1252										Percent Non-Detects		100.00%
1253												
1254												
1255												
1256												
1257												
1258												
1259												
1260												
1261												
1262												
1263												
1264												
1265					Number of Valid Observations	2				Number of Distinct Observations		2
1266												
1267												
1268												
1269												
1270												
1271												
1272												

Warning: This data set only has 2 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Selenium, dissolved (mw-34-100) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Selenium, dissolved (mw-34-55)

General Statistics

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Selenium, dissolved (mw-34-55) was not processed!

Selenium, dissolved (mw-34-80)

General Statistics

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Selenium, dissolved (mw-34-80) was not processed!

Selenium, dissolved (mw-35-135)

General Statistics

Warning: This data set only has 2 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Selenium, dissolved (mw-35-135) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

	A	B	C	D	E	F	G	H	I	J	K	L
1273	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1274												
1275												
1276												
1277	**Selenium, dissolved (mw-35-60)**											
1278												
1279	**General Statistics**											
1280	Number of Valid Observations					1	Number of Distinct Observations					1
1281												
1282												
1283	**Warning: This data set only has 1 observations!**											
1284	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1285	**The data set for variable Selenium, dissolved (mw-35-60) was not processed!**											
1286												
1287	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1288	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1289												
1290												
1291												
1292	**Selenium, dissolved (mw-37d)**											
1293												
1294	**General Statistics**											
1295	Number of Valid Data					13	Number of Detected Data					10
1296	Number of Distinct Detected Data					9	Number of Non-Detect Data					3
1297							Percent Non-Detects					23.08%
1298												
1299	**Raw Statistics**						**Log-transformed Statistics**					
1300	Minimum Detected					0.00278	Minimum Detected					-5.885
1301	Maximum Detected					0.01	Maximum Detected					-4.605
1302	Mean of Detected					0.00454	Mean of Detected					-5.527
1303	SD of Detected					0.00289	SD of Detected					0.493
1304	Minimum Non-Detect					0.005	Minimum Non-Detect					-5.298
1305	Maximum Non-Detect					0.01	Maximum Non-Detect					-4.605
1306												
1307	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					11
1308	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					2
1309	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					84.62%
1310												
1311	**UCL Statistics**											
1312	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1313	Shapiro Wilk Test Statistic					0.593	Shapiro Wilk Test Statistic					0.662
1314	5% Shapiro Wilk Critical Value					0.842	5% Shapiro Wilk Critical Value					0.842
1315	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1316												
1317	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1318	DL/2 Substitution Method						DL/2 Substitution Method					
1319	Mean					0.00445	Mean					-5.527
1320	SD					0.00258	SD					0.457
1321	95% DL/2 (t) UCL					0.00573	95% H-Stat (DL/2) UCL					0.00857
1322												
1323	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1324	**MLE method failed to converge properly**						Mean in Log Scale					-5.558
1325							SD in Log Scale					0.436

1326											Mean in Original Scale	0.0043
1327											SD in Original Scale	0.00256
1328											95% Percentile Bootstrap UCL	0.00545
1329											95% BCA Bootstrap UCL	0.00592
1330												
1331				**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**	
1332						k star (bias corrected)	2.842				**Data do not follow a Discernable Distribution (0.05)**	
1333						Theta Star	0.0016					
1334						nu star	56.84					
1335												
1336						A-D Test Statistic	1.84				**Nonparametric Statistics**	
1337						5% A-D Critical Value	0.729				Kaplan-Meier (KM) Method	
1338						K-S Test Statistic	0.729				Mean	0.00422
1339						5% K-S Critical Value	0.268				SD	0.00248
1340				**Data not Gamma Distributed at 5% Significance Level**							SE of Mean	0.0007254
1341											95% KM (t) UCL	0.00552
1342				**Assuming Gamma Distribution**							95% KM (z) UCL	0.00542
1343						Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.0055
1344						Minimum	0.00278				95% KM (bootstrap t) UCL	0.0129
1345						Maximum	0.01				95% KM (BCA) UCL	0.00542
1346						Mean	0.00454				95% KM (Percentile Bootstrap) UCL	0.00536
1347						Median	0.00342				95% KM (Chebyshev) UCL	0.00738
1348						SD	0.0025				97.5% KM (Chebyshev) UCL	0.00875
1349						k star	3.981				99% KM (Chebyshev) UCL	0.0114
1350						Theta star	0.00114					
1351						Nu star	103.5				**Potential UCLs to Use**	
1352						AppChi2	81.03				95% KM (BCA) UCL	0.00542
1353						95% Gamma Approximate UCL	0.0058					
1354						95% Adjusted Gamma UCL	0.00601					
1355	**Note: DL/2 is not a recommended method.**											
1356												
1357												
1358	**Selenium, dissolved (mw-37s)**											
1359												
1360							**General Statistics**					
1361						Number of Valid Observations	1				Number of Distinct Observations	1
1362												
1363												
1364							**Warning: This data set only has 1 observations!**					
1365							**Data set is too small to compute reliable and meaningful statistics and estimates!**					
1366							**The data set for variable Selenium, dissolved (mw-37s) was not processed!**					
1367												
1368							**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**					
1369							**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**					
1370												
1371												
1372												
1373	**Selenium, dissolved (mw-38d)**											
1374												
1375							**General Statistics**					
1376						Number of Valid Data	1				Number of Detected Data	0
1377						Number of Distinct Detected Data	0				Number of Non-Detect Data	1
1378											Percent Non-Detects	100.00%

	A	B	C	D	E	F	G	H	I	J	K	L
1379												
1380	**Warning: This data set only has 1 observations!**											
1381	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1382	**The data set for variable Selenium, dissolved (mw-38d) was not processed!**											
1383												
1384	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1385	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1386												
1387												
1388												
1389	**Selenium, dissolved (mw-38s)**											
1390												
1391	**General Statistics**											
1392	Number of Valid Observations	1				Number of Distinct Observations	1					
1393												
1394												
1395	**Warning: This data set only has 1 observations!**											
1396	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1397	**The data set for variable Selenium, dissolved (mw-38s) was not processed!**											
1398												
1399	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1400	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1401												
1402												
1403												
1404	**Selenium, dissolved (mw-39-60)**											
1405												
1406	**General Statistics**											
1407	Number of Valid Data	1				Number of Detected Data	0					
1408	Number of Distinct Detected Data	0				Number of Non-Detect Data	1					
1409						Percent Non-Detects	100.00%					
1410												
1411	**Warning: This data set only has 1 observations!**											
1412	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1413	**The data set for variable Selenium, dissolved (mw-39-60) was not processed!**											
1414												
1415	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1416	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1417												
1418												
1419												
1420	**Selenium, dissolved (mw-4)**											
1421												
1422	**General Statistics**											
1423	Number of Valid Observations	2				Number of Distinct Observations	2					
1424												
1425												
1426	**Warning: This data set only has 2 observations!**											
1427	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1428	**The data set for variable Selenium, dissolved (mw-4) was not processed!**											
1429												
1430	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1431	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											

	A	B	C	D	E	F	G	H	I	J	K	L
1432												
1433												
1434												
1435	**Selenium, dissolved (mw-40d)**											
1436												
1437						**General Statistics**							
1438						Number of Valid Observations	1				Number of Distinct Observations	1
1439												
1440												
1441						**Warning: This data set only has 1 observations!**							
1442						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
1443						**The data set for variable Selenium, dissolved (mw-40d) was not processed!**						
1444												
1445						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
1446						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
1447												
1448												
1449												
1450	**Selenium, dissolved (mw-40s)**											
1451												
1452						**General Statistics**							
1453						Number of Valid Observations	1				Number of Distinct Observations	1
1454												
1455												
1456						**Warning: This data set only has 1 observations!**							
1457						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
1458						**The data set for variable Selenium, dissolved (mw-40s) was not processed!**						
1459												
1460						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
1461						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
1462												
1463												
1464												
1465	**Selenium, dissolved (mw-43-25)**											
1466												
1467						**General Statistics**							
1468						Number of Valid Data	3				Number of Detected Data	0
1469						Number of Distinct Detected Data	0				Number of Non-Detect Data	3
1470											Percent Non-Detects	100.00%
1471												
1472						**Warning: This data set only has 3 observations!**							
1473						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
1474						**The data set for variable Selenium, dissolved (mw-43-25) was not processed!**						
1475												
1476						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
1477						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
1478												
1479												
1480												
1481	**Selenium, dissolved (mw-44-115)**											
1482												
1483						**General Statistics**							
1484						Number of Valid Data	3				Number of Detected Data	0

1485				Number of Distinct Detected Data		0				Number of Non-Detect Data		3
1486										Percent Non-Detects		100.00%
1487												
1488	Warning: This data set only has 3 observations!											
1489	Data set is too small to compute reliable and meaningful statistics and estimates!											
1490	The data set for variable Selenium, dissolved (mw-44-115) was not processed!											
1491												
1492	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1493	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1494												
1495												
1496												
1497	Selenium, dissolved (mw-44-125)											
1498												
1499	General Statistics											
1500				Number of Valid Data		1				Number of Detected Data		0
1501				Number of Distinct Detected Data		0				Number of Non-Detect Data		1
1502										Percent Non-Detects		100.00%
1503												
1504	Warning: This data set only has 1 observations!											
1505	Data set is too small to compute reliable and meaningful statistics and estimates!											
1506	The data set for variable Selenium, dissolved (mw-44-125) was not processed!											
1507												
1508	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1509	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1510												
1511												
1512												
1513	Selenium, dissolved (mw-45-095a)											
1514												
1515	General Statistics											
1516				Number of Valid Data		1				Number of Detected Data		0
1517				Number of Distinct Detected Data		0				Number of Non-Detect Data		1
1518										Percent Non-Detects		100.00%
1519												
1520	Warning: This data set only has 1 observations!											
1521	Data set is too small to compute reliable and meaningful statistics and estimates!											
1522	The data set for variable Selenium, dissolved (mw-45-095a) was not processed!											
1523												
1524	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1525	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1526												
1527												
1528												
1529	Selenium, dissolved (mw-46-175)											
1530												
1531	General Statistics											
1532				Number of Valid Data		1				Number of Detected Data		0
1533				Number of Distinct Detected Data		0				Number of Non-Detect Data		1
1534										Percent Non-Detects		100.00%
1535												
1536	Warning: This data set only has 1 observations!											
1537	Data set is too small to compute reliable and meaningful statistics and estimates!											

	A	B	C	D	E	F	G	H	I	J	K	L
1538	The data set for variable Selenium, dissolved (mw-46-175) was not processed!											
1539												
1540	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1541	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1542												
1543												
1544												
1545	Selenium, dissolved (mw-47-55)											
1546												
1547	General Statistics											
1548						Number of Valid Observations	1			Number of Distinct Observations	1	
1549												
1550												
1551	Warning: This data set only has 1 observations!											
1552	Data set is too small to compute reliable and meaningful statistics and estimates!											
1553	The data set for variable Selenium, dissolved (mw-47-55) was not processed!											
1554												
1555	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1556	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1557												
1558												
1559												
1560	Selenium, dissolved (mw-48)											
1561												
1562	General Statistics											
1563						Number of Valid Data	3			Number of Detected Data	1	
1564						Number of Distinct Detected Data	1			Number of Non-Detect Data	2	
1565										Percent Non-Detects	66.67%	
1566												
1567	Warning: This data set only has 3 observations!											
1568	Data set is too small to compute reliable and meaningful statistics and estimates!											
1569	The data set for variable Selenium, dissolved (mw-48) was not processed!											
1570												
1571	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1572	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1573												
1574												
1575												
1576	Selenium, dissolved (mw-5)											
1577												
1578	General Statistics											
1579						Number of Valid Observations	2			Number of Distinct Observations	2	
1580												
1581												
1582	Warning: This data set only has 2 observations!											
1583	Data set is too small to compute reliable and meaningful statistics and estimates!											
1584	The data set for variable Selenium, dissolved (mw-5) was not processed!											
1585												
1586	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1587	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1588												
1589												
1590												

	A	B	C	D	E	F	G	H	I	J	K	L
1591	**Selenium, dissolved (mw-50-200)**											
1592												
1593	**General Statistics**											
1594					Number of Valid Data	3			Number of Detected Data			2
1595					Number of Distinct Detected Data	2			Number of Non-Detect Data			1
1596									Percent Non-Detects			33.33%
1597												
1598	**Warning: This data set only has 3 observations!**											
1599	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1600	**The data set for variable Selenium, dissolved (mw-50-200) was not processed!**											
1601												
1602	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1603	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1604												
1605												
1606												
1607	**Selenium, dissolved (mw-51)**											
1608												
1609	**General Statistics**											
1610					Number of Valid Observations	3			Number of Distinct Observations			3
1611												
1612												
1613	**Warning: This data set only has 3 observations!**											
1614	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1615	**The data set for variable Selenium, dissolved (mw-51) was not processed!**											
1616												
1617	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1618	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1619												
1620												
1621												
1622	**Selenium, dissolved (mw-6)**											
1623												
1624	**General Statistics**											
1625					Number of Valid Observations	2			Number of Distinct Observations			2
1626												
1627												
1628	**Warning: This data set only has 2 observations!**											
1629	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1630	**The data set for variable Selenium, dissolved (mw-6) was not processed!**											
1631												
1632	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1633	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1634												
1635												
1636												
1637	**Selenium, dissolved (mw-7)**											
1638												
1639	**General Statistics**											
1640					Number of Valid Observations	2			Number of Distinct Observations			2
1641												
1642												
1643	**Warning: This data set only has 2 observations!**											

	A	B	C	D	E	F	G	H	I	J	K	L
1644	Data set is too small to compute reliable and meaningful statistics and estimates!											
1645	The data set for variable Selenium, dissolved (mw-7) was not processed!											
1646												
1647	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1648	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1649												
1650												
1651												
1652	Selenium, dissolved (mw-8)											
1653												
1654	General Statistics											
1655	Number of Valid Observations	2				Number of Distinct Observations	2					
1656												
1657												
1658	Warning: This data set only has 2 observations!											
1659	Data set is too small to compute reliable and meaningful statistics and estimates!											
1660	The data set for variable Selenium, dissolved (mw-8) was not processed!											
1661												
1662	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1663	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1664												
1665												
1666												
1667	Selenium, dissolved (mw-9)											
1668												
1669	General Statistics											
1670	Number of Valid Observations	2				Number of Distinct Observations	2					
1671												
1672												
1673	Warning: This data set only has 2 observations!											
1674	Data set is too small to compute reliable and meaningful statistics and estimates!											
1675	The data set for variable Selenium, dissolved (mw-9) was not processed!											
1676												
1677	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1678	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1679												
1680												
1681												
1682	Selenium, dissolved (ow-1d)											
1683												
1684	General Statistics											
1685	Number of Valid Data	15				Number of Detected Data	2					
1686	Number of Distinct Detected Data	2				Number of Non-Detect Data	13					
1687						Percent Non-Detects	86.67%					
1688												
1689	Raw Statistics					Log-transformed Statistics						
1690	Minimum Detected	0.00215				Minimum Detected	-6.142					
1691	Maximum Detected	0.00223				Maximum Detected	-6.106					
1692	Mean of Detected	0.00219				Mean of Detected	-6.124					
1693	SD of Detected	5.657E-05				SD of Detected	0.0258					
1694	Minimum Non-Detect	0.001				Minimum Non-Detect	-6.908					
1695	Maximum Non-Detect	0.01				Maximum Non-Detect	-4.605					
1696												

	A	B	C	D	E	F	G	H	I	J	K	L
1697	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
1698	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1699	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1700												
1701	**Warning: Data set has only 2 Distinct Detected Values.**											
1702	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
1703	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1704												
1705	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
1706												
1707	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1708	**Those methods will return a 'N/A' value on your output display!**											
1709												
1710	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1711	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1712												
1713												
1714	**UCL Statistics**											
1715	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1716	Shapiro Wilk Test Statistic					1	Shapiro Wilk Test Statistic					1
1717	5% Shapiro Wilk Critical Value					N/A	5% Shapiro Wilk Critical Value					N/A
1718	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1719												
1720	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1721	DL/2 Substitution Method						DL/2 Substitution Method					
1722	Mean					0.00316	Mean					-5.885
1723	SD					0.00144	SD					0.589
1724	95% DL/2 (t) UCL					0.00381	95% H-Stat (DL/2) UCL					0.00559
1725												
1726	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1727	**MLE method failed to converge properly**						Mean in Log Scale					N/A
1728							SD in Log Scale					N/A
1729							Mean in Original Scale					N/A
1730							SD in Original Scale					N/A
1731							95% Percentile Bootstrap UCL					N/A
1732							95% BCA Bootstrap UCL					N/A
1733												
1734	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1735	k star (bias corrected)					N/A	**Data do not follow a Discernable Distribution (0.05)**					
1736	Theta Star					N/A						
1737	nu star					N/A						
1738												
1739	A-D Test Statistic					0.362	**Nonparametric Statistics**					
1740	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
1741	K-S Test Statistic					N/A	Mean					0.00218
1742	5% K-S Critical Value					N/A	SD					3.771E-05
1743	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					3.079E-05
1744							95% KM (t) UCL					0.00223
1745	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00223
1746	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00224
1747	Minimum					N/A	95% KM (bootstrap t) UCL					0.00222
1748	Maximum					N/A	95% KM (BCA) UCL					0.00223
1749	Mean					N/A	95% KM (Percentile Bootstrap) UCL					0.00223

1750					Median	N/A				95% KM (Chebyshev) UCL		0.00231
1751					SD	N/A				97.5% KM (Chebyshev) UCL		0.00237
1752					k star	N/A				99% KM (Chebyshev) UCL		0.00248
1753					Theta star	N/A						
1754					Nu star	N/A				**Potential UCLs to Use**		
1755					AppChi2	N/A				95% KM (t) UCL		0.00223
1756				95% Gamma Approximate UCL		N/A				95% KM (% Bootstrap) UCL		0.00223
1757				95% Adjusted Gamma UCL		N/A						
1758	**Warning: Recommended UCL exceeds the maximum observation**											
1759	**Note: DL/2 is not a recommended method.**											
1760												
1761												
1762	**Selenium, dissolved (ow-1m)**											
1763												
1764	**General Statistics**											
1765					Number of Valid Data	14				Number of Detected Data		3
1766					Number of Distinct Detected Data	3				Number of Non-Detect Data		11
1767										Percent Non-Detects		78.57%
1768												
1769	**Raw Statistics**						**Log-transformed Statistics**					
1770					Minimum Detected	0.00178				Minimum Detected		-6.331
1771					Maximum Detected	0.0052				Maximum Detected		-5.259
1772					Mean of Detected	0.00317				Mean of Detected		-5.855
1773					SD of Detected	0.0018				SD of Detected		0.546
1774					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
1775					Maximum Non-Detect	0.01				Maximum Non-Detect		-4.605
1776												
1777	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
1778	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
1779	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
1780												
1781	**Warning: There are only 3 Distinct Detected Values in this data set**											
1782	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1783	**Those methods will return a 'N/A' value on your output display!**											
1784												
1785	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1786	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1787												
1788												
1789	**UCL Statistics**											
1790	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1791					Shapiro Wilk Test Statistic	0.907				Shapiro Wilk Test Statistic		0.964
1792					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
1793	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1794												
1795	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1796					DL/2 Substitution Method					DL/2 Substitution Method		
1797					Mean	0.00322				Mean		-5.879
1798					SD	0.00151				SD		0.619
1799					95% DL/2 (t) UCL	0.00393				95% H-Stat (DL/2) UCL		0.00541
1800												
1801					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1802	**MLE method failed to converge properly**									Mean in Log Scale		-6.316

1803											SD in Log Scale	0.512
1804											Mean in Original Scale	0.00205
1805											SD in Original Scale	0.00115
1806											95% Percentile Bootstrap UCL	0.00257
1807											95% BCA Bootstrap UCL	0.00269
1808												
1809	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1810					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
1811					Theta Star	N/A						
1812					nu star	N/A						
1813												
1814					A-D Test Statistic	0.322	**Nonparametric Statistics**					
1815					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
1816					K-S Test Statistic	N/A					Mean	0.00235
1817					5% K-S Critical Value	N/A					SD	0.00101
1818	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0004329
1819											95% KM (t) UCL	0.00312
1820	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00306
1821					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00311
1822					Minimum	N/A					95% KM (bootstrap t) UCL	0.00319
1823					Maximum	N/A					95% KM (BCA) UCL	0.0052
1824					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0052
1825					Median	N/A					95% KM (Chebyshev) UCL	0.00424
1826					SD	N/A					97.5% KM (Chebyshev) UCL	0.00505
1827					k star	N/A					99% KM (Chebyshev) UCL	0.00666
1828					Theta star	N/A						
1829					Nu star	N/A	**Potential UCLs to Use**					
1830					AppChi2	N/A					95% KM (t) UCL	0.00312
1831					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0052
1832					95% Adjusted Gamma UCL	N/A						
1833	**Note: DL/2 is not a recommended method.**											
1834												
1835												
1836	**Selenium, dissolved (ow-1s)**											
1837												
1838	**General Statistics**											
1839					Number of Valid Data	13					Number of Detected Data	3
1840					Number of Distinct Detected Data	3					Number of Non-Detect Data	10
1841											Percent Non-Detects	76.92%
1842												
1843	**Raw Statistics**						**Log-transformed Statistics**					
1844					Minimum Detected	0.0019					Minimum Detected	-6.266
1845					Maximum Detected	0.0059					Maximum Detected	-5.133
1846					Mean of Detected	0.00324					Mean of Detected	-5.886
1847					SD of Detected	0.00231					SD of Detected	0.653
1848					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
1849					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
1850												
1851	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
1852	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
1853	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
1854												
1855	**Warning: There are only 3 Distinct Detected Values in this data set**											

1856	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
1857	Those methods will return a 'N/A' value on your output display!											
1858												
1859	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
1860	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
1861												
1862												
1863	UCL Statistics											
1864	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
1865					Shapiro Wilk Test Statistic	0.752					Shapiro Wilk Test Statistic	0.753
1866					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
1867	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
1868												
1869	Assuming Normal Distribution						Assuming Lognormal Distribution					
1870					DL/2 Substitution Method						DL/2 Substitution Method	
1871					Mean	0.00344					Mean	-5.754
1872					SD	0.00147					SD	0.416
1873					95% DL/2 (t) UCL	0.00416					95% H-Stat (DL/2) UCL	0.00562
1874												
1875					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1876	MLE method failed to converge properly										Mean in Log Scale	-6.119
1877											SD in Log Scale	0.439
1878											Mean in Original Scale	0.00243
1879											SD in Original Scale	0.00125
1880											95% Percentile Bootstrap UCL	0.00302
1881											95% BCA Bootstrap UCL	0.00317
1882												
1883	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
1884					k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)					
1885					Theta Star	N/A						
1886					nu star	N/A						
1887												
1888					A-D Test Statistic	0.615	Nonparametric Statistics					
1889					5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method					
1890					K-S Test Statistic	N/A					Mean	0.00235
1891					5% K-S Critical Value	N/A					SD	0.00126
1892	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.0005126
1893											95% KM (t) UCL	0.00326
1894	Assuming Gamma Distribution										95% KM (z) UCL	0.00319
1895					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00316
1896					Minimum	N/A					95% KM (bootstrap t) UCL	0.0954
1897					Maximum	N/A					95% KM (BCA) UCL	0.0059
1898					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0059
1899					Median	N/A					95% KM (Chebyshev) UCL	0.00458
1900					SD	N/A					97.5% KM (Chebyshev) UCL	0.00555
1901					k star	N/A					99% KM (Chebyshev) UCL	0.00745
1902					Theta star	N/A						
1903					Nu star	N/A	Potential UCLs to Use					
1904					AppChi2	N/A					95% KM (t) UCL	0.00326
1905					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.0059
1906					95% Adjusted Gamma UCL	N/A						
1907	Note: DL/2 is not a recommended method.											
1908												

	A	B	C	D	E	F	G	H	I	J	K	L
1909												
1910	**Selenium, dissolved (ow-2d)**											
1911												
1912						**General Statistics**						
1913						Number of Valid Data	14				Number of Detected Data	5
1914						Number of Distinct Detected Data	5				Number of Non-Detect Data	9
1915											Percent Non-Detects	64.29%
1916												
1917						**Raw Statistics**					**Log-transformed Statistics**	
1918						Minimum Detected	0.00208				Minimum Detected	-6.175
1919						Maximum Detected	0.0171				Maximum Detected	-4.069
1920						Mean of Detected	0.00676				Mean of Detected	-5.288
1921						SD of Detected	0.00608				SD of Detected	0.84
1922						Minimum Non-Detect	0.001				Minimum Non-Detect	-6.908
1923						Maximum Non-Detect	0.01				Maximum Non-Detect	-4.605
1924												
1925	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
1926	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
1927	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	92.86%
1928												
1929						**Warning: There are only 5 Detected Values in this data**							
1930						**Note: It should be noted that even though bootstrap may be performed on this data set**						
1931						**the resulting calculations may not be reliable enough tp draw conclusions**						
1932												
1933						**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**						
1934												
1935												
1936						**UCL Statistics**						
1937						**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**	
1938						Shapiro Wilk Test Statistic	0.808				Shapiro Wilk Test Statistic	0.938
1939						5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value	0.762
1940						**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**	
1941												
1942						**Assuming Normal Distribution**					**Assuming Lognormal Distribution**	
1943						DL/2 Substitution Method					DL/2 Substitution Method	
1944						Mean	0.00442				Mean	-5.707
1945						SD	0.00402				SD	0.794
1946						95% DL/2 (t) UCL	0.00632				95% H-Stat (DL/2) UCL	0.00817
1947												
1948						Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method	
1949						**MLE method failed to converge properly**					Mean in Log Scale	-6.046
1950											SD in Log Scale	0.899
1951											Mean in Original Scale	0.0036
1952											SD in Original Scale	0.00426
1953											95% Percentile Bootstrap UCL	0.00566
1954											95% BCA Bootstrap UCL	0.00654
1955												
1956						**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**	
1957						k star (bias corrected)	0.878				**Data appear Normal at 5% Significance Level**	
1958						Theta Star	0.0077					
1959						nu star	8.781					
1960												
1961						A-D Test Statistic	0.342				**Nonparametric Statistics**	

1962				5% A-D Critical Value	0.685					Kaplan-Meier (KM) Method		
1963				K-S Test Statistic	0.685					Mean	0.004	
1964				5% K-S Critical Value	0.361					SD	0.00393	
1965				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0012	
1966										95% KM (t) UCL	0.00613	
1967				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00598	
1968				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00591	
1969				Minimum	0.00208					95% KM (bootstrap t) UCL	0.00729	
1970				Maximum	0.0171					95% KM (BCA) UCL	0.00801	
1971				Mean	0.00659					95% KM (Percentile Bootstrap) UCL	0.00724	
1972				Median	0.00635					95% KM (Chebyshev) UCL	0.00924	
1973				SD	0.00343					97.5% KM (Chebyshev) UCL	0.0115	
1974				k star	3.801					99% KM (Chebyshev) UCL	0.016	
1975				Theta star	0.00173							
1976				Nu star	106.4					**Potential UCLs to Use**		
1977				AppChi2	83.63					95% KM (t) UCL	0.00613	
1978				95% Gamma Approximate UCL	0.00839					95% KM (Percentile Bootstrap) UCL	0.00724	
1979				95% Adjusted Gamma UCL	0.00866							
1980	**Note: DL/2 is not a recommended method.**											
1981												
1982												
1983	**Selenium, dissolved (ow-2m)**											
1984												
1985					**General Statistics**							
1986				Number of Valid Data	13					Number of Detected Data	3	
1987				Number of Distinct Detected Data	3					Number of Non-Detect Data	10	
1988										Percent Non-Detects	76.92%	
1989												
1990				**Raw Statistics**						**Log-transformed Statistics**		
1991				Minimum Detected	0.00226					Minimum Detected	-6.092	
1992				Maximum Detected	0.0065					Maximum Detected	-5.036	
1993				Mean of Detected	0.00373					Mean of Detected	-5.717	
1994				SD of Detected	0.0024					SD of Detected	0.591	
1995				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
1996				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
1997												
1998	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	13	
1999	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
2000	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
2001												
2002	**Warning: There are only 3 Distinct Detected Values in this data set**											
2003	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2004	**Those methods will return a 'N/A' value on your output display!**											
2005												
2006	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2007	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2008												
2009												
2010					**UCL Statistics**							
2011				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
2012				Shapiro Wilk Test Statistic	0.778					Shapiro Wilk Test Statistic	0.798	
2013				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
2014				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		

2015												
2016	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2017				DL/2 Substitution Method						DL/2 Substitution Method		
2018				Mean	0.00321					Mean	-5.892	
2019				SD	0.00164					SD	0.634	
2020				95% DL/2 (t) UCL	0.00402					95% H-Stat (DL/2) UCL	0.00632	
2021												
2022				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
2023	**MLE method failed to converge properly**									Mean in Log Scale	-6.199	
2024										SD in Log Scale	0.539	
2025										Mean in Original Scale	0.00234	
2026										SD in Original Scale	0.00147	
2027										95% Percentile Bootstrap UCL	0.00304	
2028										95% BCA Bootstrap UCL	0.00328	
2029												
2030	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2031				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
2032				Theta Star	N/A							
2033				nu star	N/A							
2034												
2035				A-D Test Statistic	0.555		**Nonparametric Statistics**					
2036				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
2037				K-S Test Statistic	N/A					Mean	0.00273	
2038				5% K-S Critical Value	N/A					SD	0.00126	
2039	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0004888	
2040										95% KM (t) UCL	0.0036	
2041	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00354	
2042				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00346	
2043				Minimum	N/A					95% KM (bootstrap t) UCL	0.00924	
2044				Maximum	N/A					95% KM (BCA) UCL	N/A	
2045				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0065	
2046				Median	N/A					95% KM (Chebyshev) UCL	0.00486	
2047				SD	N/A					97.5% KM (Chebyshev) UCL	0.00578	
2048				k star	N/A					99% KM (Chebyshev) UCL	0.0076	
2049				Theta star	N/A							
2050				Nu star	N/A		**Potential UCLs to Use**					
2051				AppChi2	N/A					95% KM (t) UCL	0.0036	
2052				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0065	
2053				95% Adjusted Gamma UCL	N/A							
2054	**Note: DL/2 is not a recommended method.**											
2055												
2056												
2057	**Selenium, dissolved (ow-2s)**											
2058												
2059	**General Statistics**											
2060				Number of Valid Data	13					Number of Detected Data	4	
2061				Number of Distinct Detected Data	4					Number of Non-Detect Data	9	
2062										Percent Non-Detects	69.23%	
2063												
2064	**Raw Statistics**						**Log-transformed Statistics**					
2065				Minimum Detected	0.00266					Minimum Detected	-5.929	
2066				Maximum Detected	0.0068					Maximum Detected	-4.991	
2067				Mean of Detected	0.00461					Mean of Detected	-5.473	

2068					SD of Detected	0.0022					SD of Detected	0.505
2069					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
2070					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
2071												
2072	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
2073	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
2074	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
2075												
2076	**Warning: There are only 4 Distinct Detected Values in this data**											
2077	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2078	**the resulting calculations may not be reliable enough tp draw conclusions**											
2079												
2080	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2081												
2082												
2083	**UCL Statistics**											
2084	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2085					Shapiro Wilk Test Statistic	0.806					Shapiro Wilk Test Statistic	0.795
2086					5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748
2087	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2088												
2089	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2090					DL/2 Substitution Method						DL/2 Substitution Method	
2091					Mean	0.00392					Mean	-5.619
2092					SD	0.00161					SD	0.404
2093					95% DL/2 (t) UCL	0.00471					95% H-Stat (DL/2) UCL	0.00558
2094												
2095					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2096	**MLE method failed to converge properly**										Mean in Log Scale	-5.704
2097											SD in Log Scale	0.398
2098											Mean in Original Scale	0.0036
2099											SD in Original Scale	0.00155
2100											95% Percentile Bootstrap UCL	0.00429
2101											95% BCA Bootstrap UCL	0.0044
2102												
2103	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2104					k star (bias corrected)	1.551	**Data appear Normal at 5% Significance Level**					
2105					Theta Star	0.00297						
2106					nu star	12.41						
2107												
2108					A-D Test Statistic	0.582	**Nonparametric Statistics**					
2109					5% A-D Critical Value	0.659	Kaplan-Meier (KM) Method					
2110					K-S Test Statistic	0.659					Mean	0.00356
2111					5% K-S Critical Value	0.396					SD	0.00158
2112	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0006091
2113											95% KM (t) UCL	0.00464
2114	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00456
2115					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00458
2116					Minimum	0.0007387					95% KM (bootstrap t) UCL	0.00454
2117					Maximum	0.0068					95% KM (BCA) UCL	0.0068
2118					Mean	0.0038					95% KM (Percentile Bootstrap) UCL	0.00633
2119					Median	0.00362					95% KM (Chebyshev) UCL	0.00621
2120					SD	0.0019					97.5% KM (Chebyshev) UCL	0.00736

2121					k star	2.755				99% KM (Chebyshev) UCL		0.00962
2122					Theta star	0.00138						
2123					Nu star	71.63	**Potential UCLs to Use**					
2124					AppChi2	53.15				95% KM (t) UCL		0.00464
2125					95% Gamma Approximate UCL	0.00512				95% KM (Percentile Bootstrap) UCL		0.00633
2126					95% Adjusted Gamma UCL	N/A						
2127	**Note: DL/2 is not a recommended method.**											
2128												
2129												
2130	**Selenium, dissolved (ow-3d)**											
2131												
2132	**General Statistics**											
2133					Number of Valid Data	1				Number of Detected Data		0
2134					Number of Distinct Detected Data	0				Number of Non-Detect Data		1
2135										Percent Non-Detects		100.00%
2136												
2137	**Warning: This data set only has 1 observations!**											
2138	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2139	**The data set for variable Selenium, dissolved (ow-3d) was not processed!**											
2140												
2141	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2142	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2143												
2144												
2145												
2146	**Selenium, dissolved (ow-3m)**											
2147												
2148	**General Statistics**											
2149					Number of Valid Data	3				Number of Detected Data		1
2150					Number of Distinct Detected Data	1				Number of Non-Detect Data		2
2151										Percent Non-Detects		66.67%
2152												
2153	**Warning: This data set only has 3 observations!**											
2154	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2155	**The data set for variable Selenium, dissolved (ow-3m) was not processed!**											
2156												
2157	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2158	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2159												
2160												
2161												
2162	**Selenium, dissolved (ow-3s)**											
2163												
2164	**General Statistics**											
2165					Number of Valid Data	2				Number of Detected Data		1
2166					Number of Distinct Detected Data	1				Number of Non-Detect Data		1
2167										Percent Non-Detects		50.00%
2168												
2169	**Warning: This data set only has 2 observations!**											
2170	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2171	**The data set for variable Selenium, dissolved (ow-3s) was not processed!**											
2172												
2173	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											

	A	B	C	D	E	F	G	H	I	J	K	L
2174	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2175												
2176												
2177												
2178	**Selenium, dissolved (ow-5d)**											
2179												
2180	**General Statistics**											
2181					Number of Valid Data	14			Number of Detected Data	2		
2182					Number of Distinct Detected Data	2			Number of Non-Detect Data	12		
2183									Percent Non-Detects	85.71%		
2184												
2185	**Raw Statistics**						**Log-transformed Statistics**					
2186					Minimum Detected	0.00225			Minimum Detected	-6.097		
2187					Maximum Detected	0.00246			Maximum Detected	-6.008		
2188					Mean of Detected	0.00236			Mean of Detected	-6.052		
2189					SD of Detected	0.0001485			SD of Detected	0.0631		
2190					Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908		
2191					Maximum Non-Detect	0.01			Maximum Non-Detect	-4.605		
2192												
2193	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	14		
2194	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	0		
2195	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	100.00%		
2196												
2197	**Warning: Data set has only 2 Distinct Detected Values.**											
2198	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
2199	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
2200												
2201	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
2202												
2203	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2204	**Those methods will return a 'N/A' value on your output display!**											
2205												
2206	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2207	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2208												
2209												
2210	**UCL Statistics**											
2211	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2212					Shapiro Wilk Test Statistic	1			Shapiro Wilk Test Statistic	1		
2213					5% Shapiro Wilk Critical Value	N/A			5% Shapiro Wilk Critical Value	N/A		
2214	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2215												
2216	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2217					DL/2 Substitution Method				DL/2 Substitution Method			
2218					Mean	0.00305			Mean	-5.917		
2219					SD	0.00138			SD	0.585		
2220					95% DL/2 (t) UCL	0.0037			95% H-Stat (DL/2) UCL	0.0055		
2221												
2222					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
2223	**MLE method failed to converge properly**								Mean in Log Scale	N/A		
2224									SD in Log Scale	N/A		
2225									Mean in Original Scale	N/A		
2226									SD in Original Scale	N/A		

2227											95% Percentile Bootstrap UCL	N/A
2228											95% BCA Bootstrap UCL	N/A
2229												
2230	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2231					k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**					
2232					Theta Star	N/A						
2233					nu star	N/A						
2234												
2235					A-D Test Statistic	0.359	**Nonparametric Statistics**					
2236					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
2237					K-S Test Statistic	N/A					Mean	0.00232
2238					5% K-S Critical Value	N/A					SD	9.9E-05
2239	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	8.083E-05
2240											95% KM (t) UCL	0.00246
2241	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00245
2242					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00249
2243					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
2244					Maximum	N/A					95% KM (BCA) UCL	N/A
2245					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.00246
2246					Median	N/A					95% KM (Chebyshev) UCL	0.00267
2247					SD	N/A					97.5% KM (Chebyshev) UCL	0.00282
2248					k star	N/A					99% KM (Chebyshev) UCL	0.00312
2249					Theta star	N/A						
2250					Nu star	N/A	**Potential UCLs to Use**					
2251					AppChi2	N/A					95% KM (t) UCL	0.00246
2252					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.00246
2253					95% Adjusted Gamma UCL	N/A						
2254	**Warning: Recommended UCL exceeds the maximum observation**											
2255	**Note: DL/2 is not a recommended method.**											
2256												
2257												
2258												
2259												
2260												
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2316												
2317												
2318												
2319												
2320												
2321												
2322												
2323												
2324												
2325												
2326												
2327												
2328												
2329												
2330												
2331												
2332	**Selenium, dissolved (ow-5s)**											

2333												
2334	**General Statistics**											
2335					Number of Valid Data	14				Number of Detected Data		3
2336					Number of Distinct Detected Data	3				Number of Non-Detect Data		11
2337										Percent Non-Detects		78.57%
2338												
2339	**Raw Statistics**							**Log-transformed Statistics**				
2340					Minimum Detected	0.00269				Minimum Detected		-5.918
2341					Maximum Detected	0.00294				Maximum Detected		-5.829
2342					Mean of Detected	0.00282				Mean of Detected		-5.873
2343					SD of Detected	0.000125				SD of Detected		0.0445
2344					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
2345					Maximum Non-Detect	0.01				Maximum Non-Detect		-4.605
2346												
2347	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
2348	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
2349	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
2350												
2351	**Warning: There are only 3 Distinct Detected Values in this data set**											
2352	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2353	**Those methods will return a 'N/A' value on your output display!**											
2354												
2355	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2356	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2357												
2358												
2359	**UCL Statistics**											
2360	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
2361					Shapiro Wilk Test Statistic	0.999				Shapiro Wilk Test Statistic		0.999
2362					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
2363	**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
2364												
2365	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
2366					DL/2 Substitution Method					DL/2 Substitution Method		
2367					Mean	0.00328				Mean		-5.768
2368					SD	0.00114				SD		0.312
2369					95% DL/2 (t) UCL	0.00382				95% H-Stat (DL/2) UCL		0.00491
2370												
2371					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
2372	**MLE method failed to converge properly**									Mean in Log Scale		-5.873
2373										SD in Log Scale		0.0456
2374										Mean in Original Scale		0.00282
2375										SD in Original Scale		0.0001283
2376										95% Percentile Bootstrap UCL		0.00287
2377										95% BCA Bootstrap UCL		0.00287
2378												
2379	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
2380					k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**				
2381					Theta Star	N/A						
2382					nu star	N/A						
2383												
2384					A-D Test Statistic	0.247		**Nonparametric Statistics**				
2385					5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method		

2386				K-S Test Statistic	N/A					Mean	0.00282	
2387				5% K-S Critical Value	N/A					SD	0.0001021	
2388				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	7.219E-05	
2389										95% KM (t) UCL	0.00294	
2390				**Assuming Gamma Distribution**						95% KM (z) UCL	0.00294	
2391				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00297	
2392				Minimum	N/A					95% KM (bootstrap t) UCL	0.00299	
2393				Maximum	N/A					95% KM (BCA) UCL	0.00294	
2394				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
2395				Median	N/A					95% KM (Chebyshev) UCL	0.00313	
2396				SD	N/A					97.5% KM (Chebyshev) UCL	0.00327	
2397				k star	N/A					99% KM (Chebyshev) UCL	0.00353	
2398				Theta star	N/A							
2399				Nu star	N/A					**Potential UCLs to Use**		
2400				AppChi2	N/A					95% KM (t) UCL	0.00294	
2401				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
2402				95% Adjusted Gamma UCL	N/A							
2403				**Warning: Recommended UCL exceeds the maximum observation**								
2404	**Note: DL/2 is not a recommended method.**											
2405												
2406												
2407	**Selenium, dissolved (park moabi-4)**											
2408												
2409				**General Statistics**								
2410				Number of Valid Observations	1					Number of Distinct Observations	1	
2411												
2412												
2413				**Warning: This data set only has 1 observations!**								
2414				**Data set is too small to compute reliable and meaningful statistics and estimates!**								
2415				**The data set for variable Selenium, dissolved (park moabi-4) was not processed!**								
2416												
2417				**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**								
2418				**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**								
2419												
2420												
2421												
2422	**Selenium, dissolved (tw-1)**											
2423												
2424				**General Statistics**								
2425				Number of Valid Observations	4					Number of Distinct Observations	4	
2426												
2427												
2428				**Warning: This data set only has 4 observations!**								
2429				**Data set is too small to compute reliable and meaningful statistics and estimates!**								
2430				**The data set for variable Selenium, dissolved (tw-1) was not processed!**								
2431												
2432				**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**								
2433				**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**								
2434												
2435												
2436												
2437	**Selenium, dissolved (tw-2d)**											
2438												

	A	B	C	D	E	F	G	H	I	J	K	L
2439	**General Statistics**											
2440					Number of Valid Data	3				Number of Detected Data		2
2441					Number of Distinct Detected Data	2				Number of Non-Detect Data		1
2442										Percent Non-Detects		33.33%
2443												
2444	**Warning: This data set only has 3 observations!**											
2445	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2446	**The data set for variable Selenium, dissolved (tw-2d) was not processed!**											
2447												
2448	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2449	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2450												
2451												
2452												
2453	**Selenium, dissolved (tw-2s)**											
2454												
2455	**General Statistics**											
2456					Number of Valid Data	3				Number of Detected Data		1
2457					Number of Distinct Detected Data	1				Number of Non-Detect Data		2
2458										Percent Non-Detects		66.67%
2459												
2460	**Warning: This data set only has 3 observations!**											
2461	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2462	**The data set for variable Selenium, dissolved (tw-2s) was not processed!**											
2463												
2464	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2465	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2466												
2467												

1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	Vanadium, dissolved (1)											
10												
11					General Statistics							
12					Number of Valid Data	149			Number of Detected Data	127		
13					Number of Distinct Detected Data	109			Number of Non-Detect Data	22		
14									Percent Non-Detects	14.77%		
15												
16					Raw Statistics				Log-transformed Statistics			
17					Minimum Detected	0.00102			Minimum Detected	-6.888		
18					Maximum Detected	0.0803			Maximum Detected	-2.522		
19					Mean of Detected	0.0162			Mean of Detected	-4.373		
20					SD of Detected	0.0125			SD of Detected	0.741		
21					Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908		
22					Maximum Non-Detect	0.0193			Maximum Non-Detect	-3.948		
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	113		
25	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	36		
26	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	75.84%		
27												
28					UCL Statistics							
29					Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only			
30					Lilliefors Test Statistic	0.196			Lilliefors Test Statistic	0.098		
31					5% Lilliefors Critical Value	0.0786			5% Lilliefors Critical Value	0.0786		
32					Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
33												
34					Assuming Normal Distribution				Assuming Lognormal Distribution			
35					DL/2 Substitution Method				DL/2 Substitution Method			
36					Mean	0.0139			Mean	-4.827		
37					SD	0.0128			SD	1.312		
38					95% DL/2 (t) UCL	0.0157			95% H-Stat (DL/2) UCL	0.0183		
39												
40					Maximum Likelihood Estimate(MLE) Method				Log ROS Method			
41					Mean	0.00216			Mean in Log Scale	-4.603		
42					SD	0.0227			SD in Log Scale	0.893		
43					95% MLE (t) UCL	0.00524			Mean in Original Scale	0.0142		
44					95% MLE (Tiku) UCL	0.00865			SD in Original Scale	0.0125		
45									95% Percentile Bootstrap UCL	0.0158		
46									95% BCA Bootstrap UCL	0.016		
47												
48					Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only			
49					k star (bias corrected)	2.105			Data do not follow a Discernable Distribution (0.05)			
50					Theta Star	0.00769						
51					nu star	534.6						
52												
53					A-D Test Statistic	1.108			Nonparametric Statistics			

54				5% A-D Critical Value	0.764					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.764					Mean		0.014
56				5% K-S Critical Value	0.0835					SD		0.0127
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.00104
58										95% KM (t) UCL		0.0157
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.0157
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0157
61				Minimum	1E-09					95% KM (bootstrap t) UCL		0.016
62				Maximum	0.0803					95% KM (BCA) UCL		0.0159
63				Mean	0.0141					95% KM (Percentile Bootstrap) UCL		0.0157
64				Median	0.0122					95% KM (Chebyshev) UCL		0.0186
65				SD	0.0127					97.5% KM (Chebyshev) UCL		0.0205
66				k star	0.505					99% KM (Chebyshev) UCL		0.0244
67				Theta star	0.028							
68				Nu star	150.5					**Potential UCLs to Use**		
69				AppChi2	123.1					95% KM (BCA) UCL		0.0159
70				95% Gamma Approximate UCL	0.0173							
71				95% Adjusted Gamma UCL	0.0173							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Vanadium, dissolved (cw-1d)**											
76												
77					**General Statistics**							
78				Number of Valid Data	7					Number of Detected Data		6
79				Number of Distinct Detected Data	6					Number of Non-Detect Data		1
80										Percent Non-Detects		14.29%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.00416					Minimum Detected		-5.482
84				Maximum Detected	0.0893					Maximum Detected		-2.416
85				Mean of Detected	0.0265					Mean of Detected		-4.207
86				SD of Detected	0.0326					SD of Detected		1.161
87				Minimum Non-Detect	0.005					Minimum Non-Detect		-5.298
88				Maximum Non-Detect	0.005					Maximum Non-Detect		-5.298
89												
90												
91	**Warning: There are only 6 Detected Values in this data**											
92	**Note: It should be noted that even though bootstrap may be performed on this data set**											
93	**the resulting calculations may not be reliable enough tp draw conclusions**											
94												
95	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
96												
97												
98					**UCL Statistics**							
99				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
100				Shapiro Wilk Test Statistic	0.747					Shapiro Wilk Test Statistic		0.942
101				5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value		0.788
102				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
103												
104				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
105				DL/2 Substitution Method						DL/2 Substitution Method		
106				Mean	0.023					Mean		-4.462

107				SD	0.0311					SD	1.256
108				95% DL/2 (t) UCL	0.0459					95% H-Stat (DL/2) UCL	0.17
109											
110				Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
111				Mean	0.0163					Mean in Log Scale	-4.455
112				SD	0.0364					SD in Log Scale	1.245
113				95% MLE (t) UCL	0.043					Mean in Original Scale	0.0231
114				95% MLE (Tiku) UCL	0.044					SD in Original Scale	0.0311
115										95% Percentile Bootstrap UCL	0.0431
116										95% BCA Bootstrap UCL	0.0494
117											
118				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
119				k star (bias corrected)	0.612					**Data appear Gamma Distributed at 5% Significance Level**	
120				Theta Star	0.0432						
121				nu star	7.349						
122											
123				A-D Test Statistic	0.376					**Nonparametric Statistics**	
124				5% A-D Critical Value	0.715					Kaplan-Meier (KM) Method	
125				K-S Test Statistic	0.715					Mean	0.0233
126				5% K-S Critical Value	0.341					SD	0.0287
127				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0119
128										95% KM (t) UCL	0.0463
129				**Assuming Gamma Distribution**						95% KM (z) UCL	0.0428
130				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.046
131				Minimum	1E-09					95% KM (bootstrap t) UCL	0.13
132				Maximum	0.0893					95% KM (BCA) UCL	0.0423
133				Mean	0.0227					95% KM (Percentile Bootstrap) UCL	0.0424
134				Median	0.0122					95% KM (Chebyshev) UCL	0.075
135				SD	0.0314					97.5% KM (Chebyshev) UCL	0.0974
136				k star	0.241					99% KM (Chebyshev) UCL	0.141
137				Theta star	0.0942						
138				Nu star	3.371					**Potential UCLs to Use**	
139				AppChi2	0.49					95% KM (Chebyshev) UCL	0.075
140				95% Gamma Approximate UCL	0.156						
141				95% Adjusted Gamma UCL	0.297						
142	**Note: DL/2 is not a recommended method.**										
143											
144											
145	**Vanadium, dissolved (cw-1m)**										
146											
147						**General Statistics**						
148				Number of Valid Data	7					Number of Detected Data	6
149				Number of Distinct Detected Data	6					Number of Non-Detect Data	1
150										Percent Non-Detects	14.29%
151											
152				**Raw Statistics**						**Log-transformed Statistics**	
153				Minimum Detected	0.00357					Minimum Detected	-5.635
154				Maximum Detected	0.0977					Maximum Detected	-2.326
155				Mean of Detected	0.0252					Mean of Detected	-4.482
156				SD of Detected	0.0368					SD of Detected	1.346
157				Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
158				Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298
159											

160												
161	**Warning: There are only 6 Detected Values in this data**											
162	**Note: It should be noted that even though bootstrap may be performed on this data set**											
163	**the resulting calculations may not be reliable enough tp draw conclusions**											
164												
165	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
166												
167												
168	**UCL Statistics**											
169	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
170	Shapiro Wilk Test Statistic				0.688		Shapiro Wilk Test Statistic					0.864
171	5% Shapiro Wilk Critical Value				0.788		5% Shapiro Wilk Critical Value					0.788
172	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
173												
174	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
175	DL/2 Substitution Method						DL/2 Substitution Method					
176	Mean				0.0219		Mean					-4.698
177	SD				0.0347		SD					1.355
178	95% DL/2 (t) UCL				0.0474		95% H-Stat (DL/2) UCL					0.338
179												
180	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
181	**MLE yields a negative mean**						Mean in Log Scale					-4.624
182							SD in Log Scale					1.284
183							Mean in Original Scale					0.0222
184							SD in Original Scale					0.0345
185							95% Percentile Bootstrap UCL					0.0456
186							95% BCA Bootstrap UCL					0.0511
187												
188	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
189	k star (bias corrected)				0.485		**Data appear Gamma Distributed at 5% Significance Level**					
190	Theta Star				0.0519							
191	nu star				5.823							
192												
193	A-D Test Statistic				0.556		**Nonparametric Statistics**					
194	5% A-D Critical Value				0.721		Kaplan-Meier (KM) Method					
195	K-S Test Statistic				0.721		Mean					0.0221
196	5% K-S Critical Value				0.343		SD					0.032
197	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0132
198							95% KM (t) UCL					0.0479
199	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0439
200	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0475
201	Minimum				0.00357		95% KM (bootstrap t) UCL					0.173
202	Maximum				0.0977		95% KM (BCA) UCL					0.0456
203	Mean				0.0221		95% KM (Percentile Bootstrap) UCL					0.0453
204	Median				0.00419		95% KM (Chebyshev) UCL					0.0799
205	SD				0.0346		97.5% KM (Chebyshev) UCL					0.105
206	k star				0.509		99% KM (Chebyshev) UCL					0.154
207	Theta star				0.0434							
208	Nu star				7.13		**Potential UCLs to Use**					
209	AppChi2				2.242		95% KM (Chebyshev) UCL					0.0799
210	95% Gamma Approximate UCL				0.0703							
211	95% Adjusted Gamma UCL				0.105							
212	**Note: DL/2 is not a recommended method.**											

213												
214												
215	**Vanadium, dissolved (cw-2d)**											
216												
217						**General Statistics**							
218						Number of Valid Data	7				Number of Detected Data	6
219						Number of Distinct Detected Data	6				Number of Non-Detect Data	1
220											Percent Non-Detects	14.29%
221												
222						**Raw Statistics**					**Log-transformed Statistics**	
223						Minimum Detected	0.00545				Minimum Detected	-5.212
224						Maximum Detected	0.121				Maximum Detected	-2.112
225						Mean of Detected	0.0335				Mean of Detected	-4.057
226						SD of Detected	0.045				SD of Detected	1.218
227						Minimum Non-Detect	0.005				Minimum Non-Detect	-5.298
228						Maximum Non-Detect	0.005				Maximum Non-Detect	-5.298
229												
230												
231						**Warning: There are only 6 Detected Values in this data**							
232						**Note: It should be noted that even though bootstrap may be performed on this data set**						
233						**the resulting calculations may not be reliable enough tp draw conclusions**						
234												
235						**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**						
236												
237												
238						**UCL Statistics**							
239						**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**	
240						Shapiro Wilk Test Statistic	0.716				Shapiro Wilk Test Statistic	0.906
241						5% Shapiro Wilk Critical Value	0.788				5% Shapiro Wilk Critical Value	0.788
242						**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**	
243												
244						**Assuming Normal Distribution**					**Assuming Lognormal Distribution**	
245						DL/2 Substitution Method					DL/2 Substitution Method	
246						Mean	0.0291				Mean	-4.334
247						SD	0.0427				SD	1.33
248						95% DL/2 (t) UCL	0.0605				95% H-Stat (DL/2) UCL	0.314
249												
250						Maximum Likelihood Estimate(MLE) Method					Log ROS Method	
251						Mean	0.0254				Mean in Log Scale	-4.494
252						SD	0.0438				SD in Log Scale	1.604
253						95% MLE (t) UCL	0.0576				Mean in Original Scale	0.0289
254						95% MLE (Tiku) UCL	0.0562				SD in Original Scale	0.0429
255											95% Percentile Bootstrap UCL	0.0559
256											95% BCA Bootstrap UCL	0.0672
257												
258						**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**	
259						k star (bias corrected)	0.554				**Data appear Gamma Distributed at 5% Significance Level**	
260						Theta Star	0.0606					
261						nu star	6.642					
262												
263						A-D Test Statistic	0.477				**Nonparametric Statistics**	
264						5% A-D Critical Value	0.718				Kaplan-Meier (KM) Method	
265						K-S Test Statistic	0.718				Mean	0.0295

266				5% K-S Critical Value	0.342						SD	0.0393
267	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0163
268											95% KM (t) UCL	0.0611
269	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0563
270				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.0606
271				Minimum	1E-09						95% KM (bootstrap t) UCL	0.23
272				Maximum	0.121						95% KM (BCA) UCL	0.056
273				Mean	0.0287						95% KM (Percentile Bootstrap) UCL	0.0573
274				Median	0.0089						95% KM (Chebyshev) UCL	0.1
275				SD	0.043						97.5% KM (Chebyshev) UCL	0.131
276				k star	0.236						99% KM (Chebyshev) UCL	0.191
277				Theta star	0.122							
278				Nu star	3.305						**Potential UCLs to Use**	
279				AppChi2	0.468						95% KM (Chebyshev) UCL	0.1
280				95% Gamma Approximate UCL	0.203							
281				95% Adjusted Gamma UCL	0.389							
282	**Note: DL/2 is not a recommended method.**											
283												
284												
285	**Vanadium, dissolved (cw-2m)**											
286												
287	**General Statistics**											
288				Number of Valid Data	7						Number of Detected Data	6
289				Number of Distinct Detected Data	6						Number of Non-Detect Data	1
290											Percent Non-Detects	14.29%
291												
292	**Raw Statistics**							**Log-transformed Statistics**				
293				Minimum Detected	0.00417						Minimum Detected	-5.48
294				Maximum Detected	0.124						Maximum Detected	-2.087
295				Mean of Detected	0.0299						Mean of Detected	-4.423
296				SD of Detected	0.0475						SD of Detected	1.389
297				Minimum Non-Detect	0.005						Minimum Non-Detect	-5.298
298				Maximum Non-Detect	0.005						Maximum Non-Detect	-5.298
299												
300												
301	**Warning: There are only 6 Detected Values in this data**											
302	**Note: It should be noted that even though bootstrap may be performed on this data set**											
303	**the resulting calculations may not be reliable enough tp draw conclusions**											
304												
305	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
306												
307												
308	**UCL Statistics**											
309	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
310				Shapiro Wilk Test Statistic	0.65						Shapiro Wilk Test Statistic	0.814
311				5% Shapiro Wilk Critical Value	0.788						5% Shapiro Wilk Critical Value	0.788
312	**Data not Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
313												
314	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
315				DL/2 Substitution Method							DL/2 Substitution Method	
316				Mean	0.026						Mean	-4.647
317				SD	0.0446						SD	1.4
318				95% DL/2 (t) UCL	0.0588						95% H-Stat (DL/2) UCL	0.415

319												
320					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
321					Mean	0.00584					Mean in Log Scale	-4.612
322					SD	0.061					SD in Log Scale	1.364
323					95% MLE (t) UCL	0.0507					Mean in Original Scale	0.0261
324					95% MLE (Tiku) UCL	0.0574					SD in Original Scale	0.0445
325											95% Percentile Bootstrap UCL	0.0557
326											95% BCA Bootstrap UCL	0.0732
327												
328					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
329					k star (bias corrected)	0.444					**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
330					Theta Star	0.0673						
331					nu star	5.333						
332												
333					A-D Test Statistic	0.75					**Nonparametric Statistics**	
334					5% A-D Critical Value	0.726					Kaplan-Meier (KM) Method	
335					K-S Test Statistic	0.726					Mean	0.0262
336					5% K-S Critical Value	0.345					SD	0.0412
337					**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean	0.017
338											95% KM (t) UCL	0.0594
339					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0543
340					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0589
341					Minimum	1E-09					95% KM (bootstrap t) UCL	0.696
342					Maximum	0.124					95% KM (BCA) UCL	0.0563
343					Mean	0.0256					95% KM (Percentile Bootstrap) UCL	0.0565
344					Median	0.00513					95% KM (Chebyshev) UCL	0.101
345					SD	0.0448					97.5% KM (Chebyshev) UCL	0.133
346					k star	0.228					99% KM (Chebyshev) UCL	0.196
347					Theta star	0.112						
348					Nu star	3.195					**Potential UCLs to Use**	
349					AppChi2	0.432					95% KM (Chebyshev) UCL	0.101
350					95% Gamma Approximate UCL	0.189						
351					95% Adjusted Gamma UCL	0.365						
352	**Note: DL/2 is not a recommended method.**											
353												
354												
355	**Vanadium, dissolved (cw-3d)**											
356												
357						**General Statistics**							
358					Number of Valid Data	7					Number of Detected Data	6
359					Number of Distinct Detected Data	6					Number of Non-Detect Data	1
360											Percent Non-Detects	14.29%
361												
362					**Raw Statistics**						**Log-transformed Statistics**	
363					Minimum Detected	0.00219					Minimum Detected	-6.124
364					Maximum Detected	0.115					Maximum Detected	-2.163
365					Mean of Detected	0.0293					Mean of Detected	-4.447
366					SD of Detected	0.0434					SD of Detected	1.525
367					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
368					Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298
369												
370												
371	**Warning: There are only 6 Detected Values in this data**											

372	**Note: It should be noted that even though bootstrap may be performed on this data set**											
373	**the resulting calculations may not be reliable enough tp draw conclusions**											
374												
375	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
376												
377												
378	**UCL Statistics**											
379	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
380	Shapiro Wilk Test Statistic				0.706		Shapiro Wilk Test Statistic				0.948	
381	5% Shapiro Wilk Critical Value				0.788		5% Shapiro Wilk Critical Value				0.788	
382	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
383												
384	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
385	DL/2 Substitution Method						DL/2 Substitution Method					
386	Mean				0.0255		Mean				-4.668	
387	SD				0.0409		SD				1.509	
388	95% DL/2 (t) UCL				0.0556		95% H-Stat (DL/2) UCL				0.648	
389												
390	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
391	Mean				0.00788		Mean in Log Scale				-4.681	
392	SD				0.056		SD in Log Scale				1.523	
393	95% MLE (t) UCL				0.049		Mean in Original Scale				0.0255	
394	95% MLE (Tiku) UCL				0.0552		SD in Original Scale				0.041	
395							95% Percentile Bootstrap UCL				0.0513	
396							95% BCA Bootstrap UCL				0.0634	
397												
398	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
399	k star (bias corrected)				0.443		**Data appear Gamma Distributed at 5% Significance Level**					
400	Theta Star				0.0663							
401	nu star				5.313							
402												
403	A-D Test Statistic				0.342		**Nonparametric Statistics**					
404	5% A-D Critical Value				0.726		Kaplan-Meier (KM) Method					
405	K-S Test Statistic				0.726		Mean				0.0255	
406	5% K-S Critical Value				0.345		SD				0.0379	
407	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean				0.0157	
408							95% KM (t) UCL				0.056	
409	**Assuming Gamma Distribution**						95% KM (z) UCL				0.0513	
410	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL				0.0556	
411	Minimum				1E-09		95% KM (bootstrap t) UCL				0.164	
412	Maximum				0.115		95% KM (BCA) UCL				0.0529	
413	Mean				0.0251		95% KM (Percentile Bootstrap) UCL				0.0513	
414	Median				0.0066		95% KM (Chebyshev) UCL				0.0939	
415	SD				0.0412		97.5% KM (Chebyshev) UCL				0.123	
416	k star				0.228		99% KM (Chebyshev) UCL				0.182	
417	Theta star				0.11							
418	Nu star				3.194		**Potential UCLs to Use**					
419	AppChi2				0.432		95% KM (Chebyshev) UCL				0.0939	
420	95% Gamma Approximate UCL				0.186							
421	95% Adjusted Gamma UCL				0.358							
422	**Note: DL/2 is not a recommended method.**											
423												
424												

	A	B	C	D	E	F	G	H	I	J	K	L
425	Vanadium, dissolved (cw-3m)											
426												
427	General Statistics											
428	Number of Valid Data					7	Number of Detected Data					6
429	Number of Distinct Detected Data					6	Number of Non-Detect Data					1
430							Percent Non-Detects					14.29%
431												
432	Raw Statistics						Log-transformed Statistics					
433	Minimum Detected					0.00224	Minimum Detected					-6.101
434	Maximum Detected					0.0983	Maximum Detected					-2.32
435	Mean of Detected					0.0249	Mean of Detected					-4.58
436	SD of Detected					0.0372	SD of Detected					1.464
437	Minimum Non-Detect					0.005	Minimum Non-Detect					-5.298
438	Maximum Non-Detect					0.005	Maximum Non-Detect					-5.298
439												
440												
441	Warning: There are only 6 Detected Values in this data											
442	Note: It should be noted that even though bootstrap may be performed on this data set											
443	the resulting calculations may not be reliable enough tp draw conclusions											
444												
445	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
446												
447												
448	UCL Statistics											
449	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
450	Shapiro Wilk Test Statistic					0.695	Shapiro Wilk Test Statistic					0.937
451	5% Shapiro Wilk Critical Value					0.788	5% Shapiro Wilk Critical Value					0.788
452	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
453												
454	Assuming Normal Distribution						Assuming Lognormal Distribution					
455	DL/2 Substitution Method						DL/2 Substitution Method					
456	Mean					0.0217	Mean					-4.782
457	SD					0.035	SD					1.439
458	95% DL/2 (t) UCL					0.0474	95% H-Stat (DL/2) UCL					0.303
459												
460	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
461	Mean					0.00681	Mean in Log Scale					-4.803
462	SD					0.0475	SD in Log Scale					1.461
463	95% MLE (t) UCL					0.0417	Mean in Original Scale					0.0216
464	95% MLE (Tiku) UCL					0.047	SD in Original Scale					0.035
465							95% Percentile Bootstrap UCL					0.0441
466							95% BCA Bootstrap UCL					0.0556
467												
468	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
469	k star (bias corrected)					0.453	Data appear Gamma Distributed at 5% Significance Level					
470	Theta Star					0.0548						
471	nu star					5.441						
472												
473	A-D Test Statistic					0.386	Nonparametric Statistics					
474	5% A-D Critical Value					0.725	Kaplan-Meier (KM) Method					
475	K-S Test Statistic					0.725	Mean					0.0216
476	5% K-S Critical Value					0.345	SD					0.0324
477	Data appear Gamma Distributed at 5% Significance Level						SE of Mean					0.0134

478											95% KM (t) UCL	0.0477
479	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0437
480	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0473
481	Minimum	1E-09									95% KM (bootstrap t) UCL	0.172
482	Maximum	0.0983									95% KM (BCA) UCL	0.0449
483	Mean	0.0213									95% KM (Percentile Bootstrap) UCL	0.0463
484	Median	0.0064									95% KM (Chebyshev) UCL	0.0801
485	SD	0.0352									97.5% KM (Chebyshev) UCL	0.105
486	k star	0.23									99% KM (Chebyshev) UCL	0.155
487	Theta star	0.0926										
488	Nu star	3.221									**Potential UCLs to Use**	
489	AppChi2	0.441									95% KM (Chebyshev) UCL	0.0801
490	95% Gamma Approximate UCL	0.156										
491	95% Adjusted Gamma UCL	0.3										
492	**Note: DL/2 is not a recommended method.**											
493												
494												
495	**Vanadium, dissolved (cw-4d)**											
496												
497	**General Statistics**											
498	Number of Valid Data	7									Number of Detected Data	6
499	Number of Distinct Detected Data	6									Number of Non-Detect Data	1
500											Percent Non-Detects	14.29%
501												
502	**Raw Statistics**										**Log-transformed Statistics**	
503	Minimum Detected	0.00284									Minimum Detected	-5.864
504	Maximum Detected	0.109									Maximum Detected	-2.216
505	Mean of Detected	0.0248									Mean of Detected	-4.531
506	SD of Detected	0.0415									SD of Detected	1.28
507	Minimum Non-Detect	0.005									Minimum Non-Detect	-5.298
508	Maximum Non-Detect	0.005									Maximum Non-Detect	-5.298
509												
510												
511	**Warning: There are only 6 Detected Values in this data**											
512	**Note: It should be noted that even though bootstrap may be performed on this data set**											
513	**the resulting calculations may not be reliable enough tp draw conclusions**											
514												
515	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
516												
517												
518	**UCL Statistics**											
519	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
520	Shapiro Wilk Test Statistic	0.591									Shapiro Wilk Test Statistic	0.898
521	5% Shapiro Wilk Critical Value	0.788									5% Shapiro Wilk Critical Value	0.788
522	**Data not Normal at 5% Significance Level**										**Data appear Lognormal at 5% Significance Level**	
523												
524	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
525	DL/2 Substitution Method										DL/2 Substitution Method	
526	Mean	0.0216									Mean	-4.739
527	SD	0.0388									SD	1.292
528	95% DL/2 (t) UCL	0.0501									95% H-Stat (DL/2) UCL	0.183
529												
530	Maximum Likelihood Estimate(MLE) Method										Log ROS Method	

531				Mean	0.00435					Mean in Log Scale		-4.716
532				SD	0.0525					SD in Log Scale		1.267
533				95% MLE (t) UCL	0.0429					Mean in Original Scale		0.0217
534				95% MLE (Tiku) UCL	0.0488					SD in Original Scale		0.0387
535										95% Percentile Bootstrap UCL		0.0495
536										95% BCA Bootstrap UCL		0.0637
537												
538			Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only			
539				k star (bias corrected)	0.472				Data Follow Appr. Gamma Distribution at 5% Significance Level			
540				Theta Star	0.0526							
541				nu star	5.663							
542												
543				A-D Test Statistic	0.705				Nonparametric Statistics			
544				5% A-D Critical Value	0.723					Kaplan-Meier (KM) Method		
545				K-S Test Statistic	0.723					Mean		0.0218
546				5% K-S Critical Value	0.344					SD		0.0358
547			Data follow Appr. Gamma Distribution at 5% Significance Level							SE of Mean		0.0148
548										95% KM (t) UCL		0.0506
549			Assuming Gamma Distribution							95% KM (z) UCL		0.0462
550				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0502
551				Minimum	1E-09					95% KM (bootstrap t) UCL		0.22
552				Maximum	0.109					95% KM (BCA) UCL		0.0508
553				Mean	0.0213					95% KM (Percentile Bootstrap) UCL		0.0506
554				Median	0.0079					95% KM (Chebyshev) UCL		0.0864
555				SD	0.039					97.5% KM (Chebyshev) UCL		0.114
556				k star	0.232					99% KM (Chebyshev) UCL		0.169
557				Theta star	0.0917							
558				Nu star	3.246				Potential UCLs to Use			
559				AppChi2	0.449					95% KM (Chebyshev) UCL		0.0864
560				95% Gamma Approximate UCL	0.154							
561				95% Adjusted Gamma UCL	0.296							
562	Note: DL/2 is not a recommended method.											
563												
564												
565	Vanadium, dissolved (cw-4m)											
566												
567					General Statistics							
568				Number of Valid Data	7					Number of Detected Data		6
569				Number of Distinct Detected Data	6					Number of Non-Detect Data		1
570										Percent Non-Detects		14.29%
571												
572			Raw Statistics						Log-transformed Statistics			
573				Minimum Detected	0.0034					Minimum Detected		-5.684
574				Maximum Detected	0.0953					Maximum Detected		-2.351
575				Mean of Detected	0.022					Mean of Detected		-4.574
576				SD of Detected	0.036					SD of Detected		1.194
577				Minimum Non-Detect	0.005					Minimum Non-Detect		-5.298
578				Maximum Non-Detect	0.005					Maximum Non-Detect		-5.298
579												
580												
581	Warning: There are only 6 Detected Values in this data											
582	Note: It should be noted that even though bootstrap may be performed on this data set											
583	the resulting calculations may not be reliable enough tp draw conclusions											

584												
585	It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.											
586												
587												
588	UCL Statistics											
589	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
590					Shapiro Wilk Test Statistic	0.579					Shapiro Wilk Test Statistic	0.842
591					5% Shapiro Wilk Critical Value	0.788					5% Shapiro Wilk Critical Value	0.788
592	Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
593												
594	Assuming Normal Distribution						Assuming Lognormal Distribution					
595					DL/2 Substitution Method						DL/2 Substitution Method	
596					Mean	0.0192					Mean	-4.777
597					SD	0.0337					SD	1.215
598					95% DL/2 (t) UCL	0.044					95% H-Stat (DL/2) UCL	0.111
599												
600					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
601					Mean	0.00428					Mean in Log Scale	-4.741
602					SD	0.0456					SD in Log Scale	1.176
603					95% MLE (t) UCL	0.0377					Mean in Original Scale	0.0193
604					95% MLE (Tiku) UCL	0.0429					SD in Original Scale	0.0337
605											95% Percentile Bootstrap UCL	0.0442
606											95% BCA Bootstrap UCL	0.0463
607												
608	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
609					k star (bias corrected)	0.503	Data appear Lognormal at 5% Significance Level					
610					Theta Star	0.0438						
611					nu star	6.036						
612												
613					A-D Test Statistic	0.842	Nonparametric Statistics					
614					5% A-D Critical Value	0.72					Kaplan-Meier (KM) Method	
615					K-S Test Statistic	0.72					Mean	0.0194
616					5% K-S Critical Value	0.343					SD	0.0311
617	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.0129
618											95% KM (t) UCL	0.0445
619	Assuming Gamma Distribution										95% KM (z) UCL	0.0406
620					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0441
621					Minimum	1E-09					95% KM (bootstrap t) UCL	0.185
622					Maximum	0.0953					95% KM (BCA) UCL	0.0453
623					Mean	0.0189					95% KM (Percentile Bootstrap) UCL	0.0446
624					Median	0.0081					95% KM (Chebyshev) UCL	0.0756
625					SD	0.0339					97.5% KM (Chebyshev) UCL	0.0999
626					k star	0.235					99% KM (Chebyshev) UCL	0.148
627					Theta star	0.0803						
628					Nu star	3.291	Potential UCLs to Use					
629					AppChi2	0.464					97.5% KM (Chebyshev) UCL	0.0999
630					95% Gamma Approximate UCL	0.134						
631					95% Adjusted Gamma UCL	0.257						
632	Warning: Recommended UCL exceeds the maximum observation											
633	Note: DL/2 is not a recommended method.											
634												
635												
636	Vanadium, dissolved (mw-1)											

637												
638	**General Statistics**											
639	Number of Valid Observations				2		Number of Distinct Observations					2
640												
641												
642	**Warning: This data set only has 2 observations!**											
643	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
644	**The data set for variable Vanadium, dissolved (mw-1) was not processed!**											
645												
646	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
647	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
648												
649												
650												
651	**Vanadium, dissolved (mw-10)**											
652												
653	**General Statistics**											
654	Number of Valid Observations				17		Number of Distinct Observations					16
655												
656	**Raw Statistics**						**Log-transformed Statistics**					
657	Minimum				0.02		Minimum of Log Data					-3.912
658	Maximum				0.165		Maximum of Log Data					-1.802
659	Mean				0.0443		Mean of log Data					-3.241
660	Median				0.0379		SD of log Data					0.439
661	SD				0.0321							
662	Coefficient of Variation				0.726							
663	Skewness				3.695							
664												
665	**Relevant UCL Statistics**											
666	**Normal Distribution Test**						**Lognormal Distribution Test**					
667	Shapiro Wilk Test Statistic				0.498		Shapiro Wilk Test Statistic					0.781
668	Shapiro Wilk Critical Value				0.892		Shapiro Wilk Critical Value					0.892
669	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
670												
671	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
672	95% Student's-t UCL				0.0579		95% H-UCL					0.0536
673	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0632
674	95% Adjusted-CLT UCL				0.0645		97.5% Chebyshev (MVUE) UCL					0.0721
675	95% Modified-t UCL				0.059		99% Chebyshev (MVUE) UCL					0.0894
676												
677	**Gamma Distribution Test**						**Data Distribution**					
678	k star (bias corrected)				3.515		**Data do not follow a Discernable Distribution (0.05)**					
679	Theta Star				0.0126							
680	nu star				119.5							
681	Approximate Chi Square Value (.05)				95.28		**Nonparametric Statistics**					
682	Adjusted Level of Significance				0.0346		95% CLT UCL					0.0571
683	Adjusted Chi Square Value				93.01		95% Jackknife UCL					0.0579
684							95% Standard Bootstrap UCL					0.0569
685	Anderson-Darling Test Statistic				1.865		95% Bootstrap-t UCL					0.0863
686	Anderson-Darling 5% Critical Value				0.743		95% Hall's Bootstrap UCL					0.113
687	Kolmogorov-Smirnov Test Statistic				0.299		95% Percentile Bootstrap UCL					0.0587
688	Kolmogorov-Smirnov 5% Critical Value				0.21		95% BCA Bootstrap UCL					0.0679
689	**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.0782

690											97.5% Chebyshev(Mean, Sd) UCL	0.0929
691			**Assuming Gamma Distribution**								99% Chebyshev(Mean, Sd) UCL	0.122
692				95% Approximate Gamma UCL	0.0555							
693				95% Adjusted Gamma UCL	0.0569							
694												
695			**Potential UCL to Use**								Use 95% Student's-t UCL	0.0579
696											or 95% Modified-t UCL	0.059
697												
698												
699	**Vanadium, dissolved (mw-11)**											
700												
701					**General Statistics**							
702				Number of Valid Observations	13					Number of Distinct Observations		13
703												
704			**Raw Statistics**							**Log-transformed Statistics**		
705				Minimum	0.0036					Minimum of Log Data		-5.627
706				Maximum	0.0859					Maximum of Log Data		-2.455
707				Mean	0.0148					Mean of log Data		-4.644
708				Median	0.00831					SD of log Data		0.782
709				SD	0.0219							
710				Coefficient of Variation	1.479							
711				Skewness	3.326							
712												
713					**Relevant UCL Statistics**							
714			**Normal Distribution Test**							**Lognormal Distribution Test**		
715				Shapiro Wilk Test Statistic	0.463					Shapiro Wilk Test Statistic		0.76
716				Shapiro Wilk Critical Value	0.866					Shapiro Wilk Critical Value		0.866
717			**Data not Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**		
718												
719			**Assuming Normal Distribution**							**Assuming Lognormal Distribution**		
720				95% Student's-t UCL	0.0256						95% H-UCL	0.0229
721			**95% UCLs (Adjusted for Skewness)**								95% Chebyshev (MVUE) UCL	0.0254
722				95% Adjusted-CLT UCL	0.0308						97.5% Chebyshev (MVUE) UCL	0.0309
723				95% Modified-t UCL	0.0266						99% Chebyshev (MVUE) UCL	0.0416
724												
725			**Gamma Distribution Test**							**Data Distribution**		
726				k star (bias corrected)	1.053					**Data do not follow a Discernable Distribution (0.05)**		
727				Theta Star	0.0141							
728				nu star	27.37							
729				Approximate Chi Square Value (.05)	16.44					**Nonparametric Statistics**		
730				Adjusted Level of Significance	0.0301						95% CLT UCL	0.0248
731				Adjusted Chi Square Value	15.24						95% Jackknife UCL	0.0256
732											95% Standard Bootstrap UCL	0.0244
733				Anderson-Darling Test Statistic	2.05						95% Bootstrap-t UCL	0.11
734				Anderson-Darling 5% Critical Value	0.753						95% Hall's Bootstrap UCL	0.0995
735				Kolmogorov-Smirnov Test Statistic	0.397						95% Percentile Bootstrap UCL	0.0265
736				Kolmogorov-Smirnov 5% Critical Value	0.242						95% BCA Bootstrap UCL	0.0319
737			**Data not Gamma Distributed at 5% Significance Level**								95% Chebyshev(Mean, Sd) UCL	0.0413
738											97.5% Chebyshev(Mean, Sd) UCL	0.0527
739			**Assuming Gamma Distribution**								99% Chebyshev(Mean, Sd) UCL	0.0753
740				95% Approximate Gamma UCL	0.0247							
741				95% Adjusted Gamma UCL	0.0266							
742												

743	**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL					0.0413
744												
745												
746	**Vanadium, dissolved (mw-12)**											
747												
748	**General Statistics**											
749	Number of Valid Observations				20		Number of Distinct Observations					19
750												
751	**Raw Statistics**						**Log-transformed Statistics**					
752	Minimum				0.009		Minimum of Log Data					-4.711
753	Maximum				0.218		Maximum of Log Data					-1.523
754	Mean				0.0401		Mean of log Data					-3.447
755	Median				0.0308		SD of log Data					0.6
756	SD				0.0431							
757	Coefficient of Variation				1.073							
758	Skewness				4.06							
759												
760	**Relevant UCL Statistics**											
761	**Normal Distribution Test**						**Lognormal Distribution Test**					
762	Shapiro Wilk Test Statistic				0.457		Shapiro Wilk Test Statistic					0.849
763	Shapiro Wilk Critical Value				0.905		Shapiro Wilk Critical Value					0.905
764	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
765												
766	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
767	95% Student's-t UCL				0.0568		95% H-UCL					0.0509
768	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL					0.0609
769	95% Adjusted-CLT UCL				0.0653		97.5% Chebyshev (MVUE) UCL					0.071
770	95% Modified-t UCL				0.0583		99% Chebyshev (MVUE) UCL					0.0907
771												
772	**Gamma Distribution Test**						**Data Distribution**					
773	k star (bias corrected)				1.999		**Data do not follow a Discernable Distribution (0.05)**					
774	Theta Star				0.0201							
775	nu star				79.97							
776	Approximate Chi Square Value (.05)				60.36		**Nonparametric Statistics**					
777	Adjusted Level of Significance				0.038		95% CLT UCL					0.056
778	Adjusted Chi Square Value				59.02		95% Jackknife UCL					0.0568
779							95% Standard Bootstrap UCL					0.0556
780	Anderson-Darling Test Statistic				1.815		95% Bootstrap-t UCL					0.0953
781	Anderson-Darling 5% Critical Value				0.751		95% Hall's Bootstrap UCL					0.123
782	Kolmogorov-Smirnov Test Statistic				0.242		95% Percentile Bootstrap UCL					0.0585
783	Kolmogorov-Smirnov 5% Critical Value				0.196		95% BCA Bootstrap UCL					0.071
784	**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					0.0821
785							97.5% Chebyshev(Mean, Sd) UCL					0.1
786	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					0.136
787	95% Approximate Gamma UCL				0.0532							
788	95% Adjusted Gamma UCL				0.0544							
789												
790	**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL					0.0821
791												
792												
793	**Vanadium, dissolved (mw-13)**											
794												
795	**General Statistics**											

Number of Valid Observations	5	Number of Distinct Observations 5

Raw Statistics		Log-transformed Statistics	
Minimum	0.0048	Minimum of Log Data	-5.339
Maximum	0.00644	Maximum of Log Data	-5.045
Mean	0.00583	Mean of log Data	-5.151
Median	0.006	SD of log Data	0.118
SD	0.0006587		
Coefficient of Variation	0.113		
Skewness	-1.106		

Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 5 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.913	Shapiro Wilk Test Statistic	0.894
Shapiro Wilk Critical Value	0.762	Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.00646	95% H-UCL	0.00659
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.00717
95% Adjusted-CLT UCL	0.00616	97.5% Chebyshev (MVUE) UCL	0.00775
95% Modified-t UCL	0.00643	99% Chebyshev (MVUE) UCL	0.0089
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	37.03	**Data appear Normal at 5% Significance Level**	
Theta Star	0.0001574		
nu star	370.3		
Approximate Chi Square Value (.05)	326.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0086	95% CLT UCL	0.00631
Adjusted Chi Square Value	308.6	95% Jackknife UCL	0.00646
		95% Standard Bootstrap UCL	0.00627
Anderson-Darling Test Statistic	0.352	95% Bootstrap-t UCL	0.00637
Anderson-Darling 5% Critical Value	0.678	95% Hall's Bootstrap UCL	0.00615
Kolmogorov-Smirnov Test Statistic	0.224	95% Percentile Bootstrap UCL	0.00624
Kolmogorov-Smirnov 5% Critical Value	0.357	95% BCA Bootstrap UCL	0.00622
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.00711
		97.5% Chebyshev(Mean, Sd) UCL	0.00767
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.00876
95% Approximate Gamma UCL	0.00661		
95% Adjusted Gamma UCL	0.00699		

849												
850	**Potential UCL to Use**										Use 95% Student's-t UCL	0.00646
851	**Recommended UCL exceeds the maximum observation**											
852												
853												
854	**Vanadium, dissolved (mw-14)**											
855												
856	**General Statistics**											
857					Number of Valid Observations	5					Number of Distinct Observations	5
858												
859	**Raw Statistics**						**Log-transformed Statistics**					
860					Minimum	0.0041					Minimum of Log Data	-5.497
861					Maximum	0.016					Maximum of Log Data	-4.135
862					Mean	0.00791					Mean of log Data	-4.96
863					Median	0.00652					SD of log Data	0.524
864					SD	0.00475						
865					Coefficient of Variation	0.601						
866					Skewness	1.741						
867												
868												
869	**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
870												
871	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
872	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
873												
874												
875	**Warning: There are only 5 Values in this data**											
876	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
877	**the resulting calculations may not be reliable enough to draw conclusions**											
878												
879	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
880												
881	**Relevant UCL Statistics**											
882	**Normal Distribution Test**						**Lognormal Distribution Test**					
883					Shapiro Wilk Test Statistic	0.82					Shapiro Wilk Test Statistic	0.936
884					Shapiro Wilk Critical Value	0.762					Shapiro Wilk Critical Value	0.762
885	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
886												
887	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
888					95% Student's-t UCL	0.0124					95% H-UCL	0.0178
889	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.0157
890					95% Adjusted-CLT UCL	0.0132					97.5% Chebyshev (MVUE) UCL	0.0191
891					95% Modified-t UCL	0.0127					99% Chebyshev (MVUE) UCL	0.0259
892												
893	**Gamma Distribution Test**						**Data Distribution**					
894					k star (bias corrected)	1.862	**Data appear Normal at 5% Significance Level**					
895					Theta Star	0.00425						
896					nu star	18.62						
897					Approximate Chi Square Value (.05)	9.841	**Nonparametric Statistics**					
898					Adjusted Level of Significance	0.0086					95% CLT UCL	0.0114
899					Adjusted Chi Square Value	7.219					95% Jackknife UCL	0.0124
900											95% Standard Bootstrap UCL	0.0111
901					Anderson-Darling Test Statistic	0.362					95% Bootstrap-t UCL	0.019

902			Anderson-Darling 5% Critical Value	0.681				95% Hall's Bootstrap UCL	0.0259			
903			Kolmogorov-Smirnov Test Statistic	0.237				95% Percentile Bootstrap UCL	0.0114			
904			Kolmogorov-Smirnov 5% Critical Value	0.358				95% BCA Bootstrap UCL	0.0122			
905			**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	0.0172			
906								97.5% Chebyshev(Mean, Sd) UCL	0.0212			
907			**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	0.029			
908			95% Approximate Gamma UCL	0.015								
909			95% Adjusted Gamma UCL	0.0204								
910												
911			**Potential UCL to Use**					Use 95% Student's-t UCL	0.0124			
912												
913												
914	**Vanadium, dissolved (mw-15)**											
915												
916			**General Statistics**									
917			Number of Valid Observations	4				Number of Distinct Observations	4			
918												
919												
920			**Warning: This data set only has 4 observations!**									
921			**Data set is too small to compute reliable and meaningful statistics and estimates!**									
922			**The data set for variable Vanadium, dissolved (mw-15) was not processed!**									
923												
924			**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**									
925			**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**									
926												
927												
928												
929	**Vanadium, dissolved (mw-19)**											
930												
931			**General Statistics**									
932			Number of Valid Observations	3				Number of Distinct Observations	3			
933												
934												
935			**Warning: This data set only has 3 observations!**									
936			**Data set is too small to compute reliable and meaningful statistics and estimates!**									
937			**The data set for variable Vanadium, dissolved (mw-19) was not processed!**									
938												
939			**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**									
940			**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**									
941												
942												
943												
944	**Vanadium, dissolved (mw-20-100)**											
945												
946			**General Statistics**									
947			Number of Valid Data	4				Number of Detected Data	3			
948			Number of Distinct Detected Data	3				Number of Non-Detect Data	1			
949								Percent Non-Detects	25.00%			
950												
951			**Warning: This data set only has 4 observations!**									
952			**Data set is too small to compute reliable and meaningful statistics and estimates!**									
953			**The data set for variable Vanadium, dissolved (mw-20-100) was not processed!**									
954												

	A	B	C	D	E	F	G	H	I	J	K	L
955	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
956	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
957												
958												
959												
960	**Vanadium, dissolved (mw-20-130)**											
961												
962	**General Statistics**											
963					Number of Valid Data	15			Number of Detected Data	11		
964					Number of Distinct Detected Data	11			Number of Non-Detect Data	4		
965									Percent Non-Detects	26.67%		
966												
967	**Raw Statistics**						**Log-transformed Statistics**					
968					Minimum Detected	0.0028			Minimum Detected	-5.878		
969					Maximum Detected	0.172			Maximum Detected	-1.76		
970					Mean of Detected	0.0291			Mean of Detected	-4.751		
971					SD of Detected	0.0553			SD of Detected	1.424		
972					Minimum Non-Detect	0.003			Minimum Non-Detect	-5.809		
973					Maximum Non-Detect	0.01			Maximum Non-Detect	-4.605		
974												
975	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	11		
976	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	4		
977	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	73.33%		
978												
979	**UCL Statistics**											
980	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
981					Shapiro Wilk Test Statistic	0.55			Shapiro Wilk Test Statistic	0.746		
982					5% Shapiro Wilk Critical Value	0.85			5% Shapiro Wilk Critical Value	0.85		
983	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
984												
985	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
986					DL/2 Substitution Method				DL/2 Substitution Method			
987					Mean	0.0222			Mean	-5.058		
988					SD	0.0482			SD	1.352		
989					95% DL/2 (t) UCL	0.0442			95% H-Stat (DL/2) UCL	0.0659		
990												
991					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
992	**MLE yields a negative mean**								Mean in Log Scale	-5.18		
993									SD in Log Scale	1.466		
994									Mean in Original Scale	0.022		
995									SD in Original Scale	0.0483		
996									95% Percentile Bootstrap UCL	0.0443		
997									95% BCA Bootstrap UCL	0.0545		
998												
999	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1000					k star (bias corrected)	0.439	**Data do not follow a Discernable Distribution (0.05)**					
1001					Theta Star	0.0664						
1002					nu star	9.65						
1003												
1004					A-D Test Statistic	1.787	**Nonparametric Statistics**					
1005					5% A-D Critical Value	0.78			Kaplan-Meier (KM) Method			
1006					K-S Test Statistic	0.78			Mean	0.0222		
1007					5% K-S Critical Value	0.269			SD	0.0466		

1008	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0126
1009											95% KM (t) UCL	0.0444
1010	**Assuming Gamma Distribution**										95% KM (z) UCL	0.043
1011	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0441
1012	Minimum	0.0028									95% KM (bootstrap t) UCL	0.339
1013	Maximum	0.172									95% KM (BCA) UCL	0.0454
1014	Mean	0.0287									95% KM (Percentile Bootstrap) UCL	0.0442
1015	Median	0.0101									95% KM (Chebyshev) UCL	0.0772
1016	SD	0.0468									97.5% KM (Chebyshev) UCL	0.101
1017	k star	0.589									99% KM (Chebyshev) UCL	0.148
1018	Theta star	0.0488										
1019	Nu star	17.67									**Potential UCLs to Use**	
1020	AppChi2	9.152									97.5% KM (Chebyshev) UCL	0.101
1021	95% Gamma Approximate UCL	0.0555										
1022	95% Adjusted Gamma UCL	0.0604										
1023	**Note: DL/2 is not a recommended method.**											
1024												
1025												
1026	**Vanadium, dissolved (mw-20-70)**											
1027												
1028	**General Statistics**											
1029	Number of Valid Data	16									Number of Detected Data	15
1030	Number of Distinct Detected Data	15									Number of Non-Detect Data	1
1031											Percent Non-Detects	6.25%
1032												
1033	**Raw Statistics**										**Log-transformed Statistics**	
1034	Minimum Detected	0.0034									Minimum Detected	-5.684
1035	Maximum Detected	0.117									Maximum Detected	-2.146
1036	Mean of Detected	0.0229									Mean of Detected	-4.36
1037	SD of Detected	0.0339									SD of Detected	0.953
1038	Minimum Non-Detect	0.003									Minimum Non-Detect	-5.809
1039	Maximum Non-Detect	0.003									Maximum Non-Detect	-5.809
1040												
1041												
1042	**UCL Statistics**											
1043	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
1044	Shapiro Wilk Test Statistic	0.539									Shapiro Wilk Test Statistic	0.774
1045	5% Shapiro Wilk Critical Value	0.881									5% Shapiro Wilk Critical Value	0.881
1046	**Data not Normal at 5% Significance Level**										**Data not Lognormal at 5% Significance Level**	
1047												
1048	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
1049	DL/2 Substitution Method										DL/2 Substitution Method	
1050	Mean	0.0215									Mean	-4.494
1051	SD	0.0332									SD	1.065
1052	95% DL/2 (t) UCL	0.0361									95% H-Stat (DL/2) UCL	0.0389
1053												
1054	Maximum Likelihood Estimate(MLE) Method										Log ROS Method	
1055	Mean	0.0203									Mean in Log Scale	-4.491
1056	SD	0.0335									SD in Log Scale	1.058
1057	95% MLE (t) UCL	0.035									Mean in Original Scale	0.0215
1058	95% MLE (Tiku) UCL	0.0338									SD in Original Scale	0.0332
1059											95% Percentile Bootstrap UCL	0.0353
1060											95% BCA Bootstrap UCL	0.0403

1061												
1062	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1063					k star (bias corrected)	0.839	**Data do not follow a Discernable Distribution (0.05)**					
1064					Theta Star	0.0272						
1065					nu star	25.17						
1066												
1067					A-D Test Statistic	2.361	**Nonparametric Statistics**					
1068					5% A-D Critical Value	0.763	Kaplan-Meier (KM) Method					
1069					K-S Test Statistic	0.763	Mean	0.0216				
1070					5% K-S Critical Value	0.228	SD	0.032				
1071	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00829				
1072							95% KM (t) UCL	0.0362				
1073	**Assuming Gamma Distribution**						95% KM (z) UCL	0.0353				
1074	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.036				
1075					Minimum	1E-09	95% KM (bootstrap t) UCL	0.0937				
1076					Maximum	0.117	95% KM (BCA) UCL	0.0375				
1077					Mean	0.0214	95% KM (Percentile Bootstrap) UCL	0.0358				
1078					Median	0.00951	95% KM (Chebyshev) UCL	0.0578				
1079					SD	0.0332	97.5% KM (Chebyshev) UCL	0.0734				
1080					k star	0.386	99% KM (Chebyshev) UCL	0.104				
1081					Theta star	0.0555						
1082					Nu star	12.34	**Potential UCLs to Use**					
1083					AppChi2	5.454	95% KM (Chebyshev) UCL	0.0578				
1084					95% Gamma Approximate UCL	0.0485						
1085					95% Adjusted Gamma UCL	0.0535						
1086	**Note: DL/2 is not a recommended method.**											
1087												
1088												
1089	**Vanadium, dissolved (mw-21)**											
1090												
1091	**General Statistics**											
1092					Number of Valid Data	6	Number of Detected Data	3				
1093					Number of Distinct Detected Data	3	Number of Non-Detect Data	3				
1094							Percent Non-Detects	50.00%				
1095												
1096	**Raw Statistics**						**Log-transformed Statistics**					
1097					Minimum Detected	0.0037	Minimum Detected	-5.599				
1098					Maximum Detected	0.0121	Maximum Detected	-4.415				
1099					Mean of Detected	0.00733	Mean of Detected	-5.032				
1100					SD of Detected	0.00431	SD of Detected	0.594				
1101					Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298				
1102					Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605				
1103												
1104	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	5				
1105	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	1				
1106	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	83.33%				
1107												
1108	**Warning: There are only 3 Distinct Detected Values in this data set**											
1109	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1110	**Those methods will return a 'N/A' value on your output display!**											
1111												
1112	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1113	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											

	A	B	C	D	E	F	G	H	I	J	K	L
1114												
1115												
1116	**UCL Statistics**											
1117	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1118					Shapiro Wilk Test Statistic	0.948				Shapiro Wilk Test Statistic		0.994
1119					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
1120	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1121												
1122	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1123					DL/2 Substitution Method					DL/2 Substitution Method		
1124					Mean	0.00533				Mean		-5.396
1125					SD	0.00362				SD		0.604
1126					95% DL/2 (t) UCL	0.00831				95% H-Stat (DL/2) UCL		0.0104
1127												
1128					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1129	**MLE method failed to converge properly**									Mean in Log Scale		-5.316
1130										SD in Log Scale		0.506
1131										Mean in Original Scale		0.00554
1132										SD in Original Scale		0.00339
1133										95% Percentile Bootstrap UCL		0.00783
1134										95% BCA Bootstrap UCL		0.00832
1135												
1136	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1137					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
1138					Theta Star	N/A						
1139					nu star	N/A						
1140												
1141					A-D Test Statistic	0.268	**Nonparametric Statistics**					
1142					5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method		
1143					K-S Test Statistic	N/A				Mean		0.00562
1144					5% K-S Critical Value	N/A				SD		0.00306
1145	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.00155
1146										95% KM (t) UCL		0.00875
1147	**Assuming Gamma Distribution**									95% KM (z) UCL		0.00817
1148					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.00861
1149					Minimum	N/A				95% KM (bootstrap t) UCL		0.00876
1150					Maximum	N/A				95% KM (BCA) UCL		0.0121
1151					Mean	N/A				95% KM (Percentile Bootstrap) UCL		N/A
1152					Median	N/A				95% KM (Chebyshev) UCL		0.0124
1153					SD	N/A				97.5% KM (Chebyshev) UCL		0.0153
1154					k star	N/A				99% KM (Chebyshev) UCL		0.021
1155					Theta star	N/A						
1156					Nu star	N/A	**Potential UCLs to Use**					
1157					AppChi2	N/A				95% KM (t) UCL		0.00875
1158					95% Gamma Approximate UCL	N/A				95% KM (Percentile Bootstrap) UCL		N/A
1159					95% Adjusted Gamma UCL	N/A						
1160	**Note: DL/2 is not a recommended method.**											
1161												
1162												
1163	**Vanadium, dissolved (mw-22)**											
1164												
1165	**General Statistics**											
1166					Number of Valid Data	6				Number of Detected Data		2

1167					Number of Distinct Detected Data	2					Number of Non-Detect Data	4
1168											Percent Non-Detects	66.67%
1169												
1170					**Raw Statistics**						**Log-transformed Statistics**	
1171					Minimum Detected	0.044					Minimum Detected	-3.124
1172					Maximum Detected	0.179					Maximum Detected	-1.72
1173					Mean of Detected	0.112					Mean of Detected	-2.422
1174					SD of Detected	0.0955					SD of Detected	0.992
1175					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
1176					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
1177												
1178	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	4
1179	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
1180	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	66.67%
1181												
1182	**Warning: Data set has only 2 Distinct Detected Values.**											
1183	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
1184	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
1185												
1186	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
1187												
1188	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
1189	**Those methods will return a 'N/A' value on your output display!**											
1190												
1191	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
1192	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
1193												
1194												
1195	**UCL Statistics**											
1196	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
1197					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
1198					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
1199	**Data not Normal at 5% Significance Level**										**Data not Lognormal at 5% Significance Level**	
1200												
1201	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
1202					DL/2 Substitution Method						DL/2 Substitution Method	
1203					Mean	0.0393					Mean	-4.686
1204					SD	0.0704					SD	1.829
1205					95% DL/2 (t) UCL	0.0972					95% H-Stat (DL/2) UCL	4.288
1206												
1207					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1208	**MLE method failed to converge properly**										Mean in Log Scale	N/A
1209											SD in Log Scale	N/A
1210											Mean in Original Scale	N/A
1211											SD in Original Scale	N/A
1212											95% Percentile Bootstrap UCL	N/A
1213											95% BCA Bootstrap UCL	N/A
1214												
1215	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
1216					k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**	
1217					Theta Star	N/A						
1218					nu star	N/A						
1219												

1220				A-D Test Statistic	0.359		**Nonparametric Statistics**					
1221				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
1222				K-S Test Statistic	N/A					Mean		0.0665
1223				5% K-S Critical Value	N/A					SD		0.0503
1224				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.029
1225										95% KM (t) UCL		0.125
1226				**Assuming Gamma Distribution**						95% KM (z) UCL		0.114
1227				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.172
1228				Minimum	N/A					95% KM (bootstrap t) UCL		1.8E+308
1229				Maximum	N/A					95% KM (BCA) UCL		0.179
1230				Mean	N/A					95% KM (Percentile Bootstrap) UCL		0.179
1231				Median	N/A					95% KM (Chebyshev) UCL		0.193
1232				SD	N/A					97.5% KM (Chebyshev) UCL		0.248
1233				k star	N/A					99% KM (Chebyshev) UCL		0.356
1234				Theta star	N/A							
1235				Nu star	N/A		**Potential UCLs to Use**					
1236				AppChi2	N/A					95% KM (t) UCL		0.125
1237				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL		0.179
1238				95% Adjusted Gamma UCL	N/A							
1239	**Note: DL/2 is not a recommended method.**											
1240												
1241												
1242												
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1309												
1310												
1311												
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1313												
1314												
1315												
1316												
1317												
1318	**Vanadium, dissolved (mw-24a)**											
1319												
1320						**General Statistics**							
1321						Number of Valid Data	5				Number of Detected Data	4
1322						Number of Distinct Detected Data	4				Number of Non-Detect Data	1
1323											Percent Non-Detects	20.00%
1324												
1325						**Raw Statistics**					**Log-transformed Statistics**	

1326				Minimum Detected	0.00718					Minimum Detected	-4.936	
1327				Maximum Detected	0.0273					Maximum Detected	-3.601	
1328				Mean of Detected	0.0154					Mean of Detected	-4.29	
1329				SD of Detected	0.00858					SD of Detected	0.553	
1330				Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298	
1331				Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298	
1332												
1333												
1334	**Warning: There are only 4 Distinct Detected Values in this data**											
1335	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1336	**the resulting calculations may not be reliable enough tp draw conclusions**											
1337												
1338	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1339												
1340												
1341	**UCL Statistics**											
1342	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1343				Shapiro Wilk Test Statistic	0.93					Shapiro Wilk Test Statistic	0.993	
1344				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value	0.748	
1345	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1346												
1347	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1348				DL/2 Substitution Method						DL/2 Substitution Method		
1349				Mean	0.0128					Mean	-4.63	
1350				SD	0.0094					SD	0.899	
1351				95% DL/2 (t) UCL	0.0218					95% H-Stat (DL/2) UCL	0.0213	
1352												
1353				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
1354				Mean	0.0122					Mean in Log Scale	-4.587	
1355				SD	0.00938					SD in Log Scale	0.82	
1356				95% MLE (t) UCL	0.0212					Mean in Original Scale	0.0129	
1357				95% MLE (Tiku) UCL	0.0214					SD in Original Scale	0.00924	
1358										95% Percentile Bootstrap UCL	0.0194	
1359										95% BCA Bootstrap UCL	0.0202	
1360												
1361	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1362				k star (bias corrected)	1.297		**Data appear Normal at 5% Significance Level**					
1363				Theta Star	0.0118							
1364				nu star	10.38							
1365												
1366				A-D Test Statistic	0.231		**Nonparametric Statistics**					
1367				5% A-D Critical Value	0.659					Kaplan-Meier (KM) Method		
1368				K-S Test Statistic	0.659					Mean	0.0137	
1369				5% K-S Critical Value	0.396					SD	0.00741	
1370	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean	0.00383	
1371										95% KM (t) UCL	0.0219	
1372	**Assuming Gamma Distribution**									95% KM (z) UCL	0.02	
1373				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0218	
1374				Minimum	0.00519					95% KM (bootstrap t) UCL	0.0232	
1375				Maximum	0.0273					95% KM (BCA) UCL	0.0212	
1376				Mean	0.0133					95% KM (Percentile Bootstrap) UCL	0.0202	
1377				Median	0.012					95% KM (Chebyshev) UCL	0.0304	
1378				SD	0.00872					97.5% KM (Chebyshev) UCL	0.0376	

1379					k star	1.395				99% KM (Chebyshev) UCL		0.0518
1380					Theta star	0.00956						
1381					Nu star	13.95	**Potential UCLs to Use**					
1382					AppChi2	6.537				95% KM (t) UCL		0.0219
1383					95% Gamma Approximate UCL	0.0285				95% KM (Percentile Bootstrap) UCL		0.0202
1384					95% Adjusted Gamma UCL	N/A						
1385	**Note: DL/2 is not a recommended method.**											
1386												
1387												
1388	**Vanadium, dissolved (mw-24b)**											
1389												
1390	**General Statistics**											
1391					Number of Valid Data	3				Number of Detected Data		2
1392					Number of Distinct Detected Data	2				Number of Non-Detect Data		1
1393										Percent Non-Detects		33.33%
1394												
1395	**Warning: This data set only has 3 observations!**											
1396	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1397	**The data set for variable Vanadium, dissolved (mw-24b) was not processed!**											
1398												
1399	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1400	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1401												
1402												
1403												
1404	**Vanadium, dissolved (mw-24br)**											
1405												
1406	**General Statistics**											
1407					Number of Valid Data	2				Number of Detected Data		1
1408					Number of Distinct Detected Data	1				Number of Non-Detect Data		1
1409										Percent Non-Detects		50.00%
1410												
1411	**Warning: This data set only has 2 observations!**											
1412	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1413	**The data set for variable Vanadium, dissolved (mw-24br) was not processed!**											
1414												
1415	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1416	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1417												
1418												
1419												
1420	**Vanadium, dissolved (mw-25)**											
1421												
1422	**General Statistics**											
1423					Number of Valid Data	13				Number of Detected Data		11
1424					Number of Distinct Detected Data	9				Number of Non-Detect Data		2
1425										Percent Non-Detects		15.38%
1426												
1427	**Raw Statistics**						**Log-transformed Statistics**					
1428					Minimum Detected	0.0051				Minimum Detected		-5.279
1429					Maximum Detected	0.0733				Maximum Detected		-2.613
1430					Mean of Detected	0.0157				Mean of Detected		-4.467
1431					SD of Detected	0.0193				SD of Detected		0.678

	A	B	C	D	E	F	G	H	I	J	K	L
1432					Minimum Non-Detect	0.003					Minimum Non-Detect	-5.809
1433					Maximum Non-Detect	0.003					Maximum Non-Detect	-5.809
1434												
1435												
1436	**UCL Statistics**											
1437	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1438					Shapiro Wilk Test Statistic	0.46					Shapiro Wilk Test Statistic	0.723
1439					5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85
1440	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1441												
1442	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1443					DL/2 Substitution Method						DL/2 Substitution Method	
1444					Mean	0.0135					Mean	-4.78
1445					SD	0.0184					SD	0.984
1446					95% DL/2 (t) UCL	0.0226					95% H-Stat (DL/2) UCL	0.024
1447												
1448					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
1449					Mean	0.0117					Mean in Log Scale	-4.678
1450					SD	0.0197					SD in Log Scale	0.809
1451					95% MLE (t) UCL	0.0215					Mean in Original Scale	0.0137
1452					95% MLE (Tiku) UCL	0.0211					SD in Original Scale	0.0182
1453											95% Percentile Bootstrap UCL	0.0237
1454											95% BCA Bootstrap UCL	0.0283
1455												
1456	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1457					k star (bias corrected)	1.341	**Data do not follow a Discernable Distribution (0.05)**					
1458					Theta Star	0.0117						
1459					nu star	29.5						
1460												
1461					A-D Test Statistic	1.872	**Nonparametric Statistics**					
1462					5% A-D Critical Value	0.74					Kaplan-Meier (KM) Method	
1463					K-S Test Statistic	0.74					Mean	0.014
1464					5% K-S Critical Value	0.259					SD	0.0173
1465	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00504
1466											95% KM (t) UCL	0.023
1467	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0223
1468					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0228
1469					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0523
1470					Maximum	0.0733					95% KM (BCA) UCL	0.0248
1471					Mean	0.0133					95% KM (Percentile Bootstrap) UCL	0.024
1472					Median	0.0111					95% KM (Chebyshev) UCL	0.036
1473					SD	0.0185					97.5% KM (Chebyshev) UCL	0.0455
1474					k star	0.367					99% KM (Chebyshev) UCL	0.0642
1475					Theta star	0.0363						
1476					Nu star	9.553	**Potential UCLs to Use**					
1477					AppChi2	3.664					95% KM (Chebyshev) UCL	0.036
1478					95% Gamma Approximate UCL	0.0347						
1479					95% Adjusted Gamma UCL	0.0402						
1480	**Note: DL/2 is not a recommended method.**											
1481												
1482												
1483	**Vanadium, dissolved (mw-26)**											
1484												

1485	**General Statistics**											
1486					Number of Valid Data	6				Number of Detected Data		4
1487					Number of Distinct Detected Data	4				Number of Non-Detect Data		2
1488										Percent Non-Detects		33.33%
1489												
1490	**Raw Statistics**							**Log-transformed Statistics**				
1491					Minimum Detected	0.0024				Minimum Detected		-6.032
1492					Maximum Detected	0.017				Maximum Detected		-4.075
1493					Mean of Detected	0.00786				Mean of Detected		-5.083
1494					SD of Detected	0.00633				SD of Detected		0.8
1495					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
1496					Maximum Non-Detect	0.01				Maximum Non-Detect		-4.605
1497												
1498	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		5
1499	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
1500	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		83.33%
1501												
1502	**Warning: There are only 4 Distinct Detected Values in this data**											
1503	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1504	**the resulting calculations may not be reliable enough tp draw conclusions**											
1505												
1506	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1507												
1508												
1509	**UCL Statistics**											
1510	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
1511					Shapiro Wilk Test Statistic	0.845				Shapiro Wilk Test Statistic		0.952
1512					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value		0.748
1513	**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
1514												
1515	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
1516					DL/2 Substitution Method					DL/2 Substitution Method		
1517					Mean	0.00649				Mean		-5.27
1518					SD	0.0054				SD		0.719
1519					95% DL/2 (t) UCL	0.0109				95% H-Stat (DL/2) UCL		0.0212
1520												
1521					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1522	**MLE method failed to converge properly**									Mean in Log Scale		-5.319
1523										SD in Log Scale		0.739
1524										Mean in Original Scale		0.00629
1525										SD in Original Scale		0.00549
1526										95% Percentile Bootstrap UCL		0.0102
1527										95% BCA Bootstrap UCL		0.0115
1528												
1529	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
1530					k star (bias corrected)	0.732		**Data appear Normal at 5% Significance Level**				
1531					Theta Star	0.0107						
1532					nu star	5.855						
1533												
1534					A-D Test Statistic	0.347		**Nonparametric Statistics**				
1535					5% A-D Critical Value	0.66				Kaplan-Meier (KM) Method		
1536					K-S Test Statistic	0.66				Mean		0.00634
1537					5% K-S Critical Value	0.398				SD		0.00505

1538	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.00241
1539											95% KM (t) UCL	0.0112
1540	Assuming Gamma Distribution										95% KM (z) UCL	0.0103
1541	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.011
1542	Minimum	0.0024									95% KM (bootstrap t) UCL	0.0166
1543	Maximum	0.017									95% KM (BCA) UCL	0.0103
1544	Mean	0.00704									95% KM (Percentile Bootstrap) UCL	0.0115
1545	Median	0.00602									95% KM (Chebyshev) UCL	0.0168
1546	SD	0.00522									97.5% KM (Chebyshev) UCL	0.0214
1547	k star	1.457									99% KM (Chebyshev) UCL	0.0303
1548	Theta star	0.00483										
1549	Nu star	17.49									Potential UCLs to Use	
1550	AppChi2	9.021									95% KM (t) UCL	0.0112
1551	95% Gamma Approximate UCL	0.0136									95% KM (Percentile Bootstrap) UCL	0.0115
1552	95% Adjusted Gamma UCL	N/A										
1553	Note: DL/2 is not a recommended method.											
1554												
1555												
1556	Vanadium, dissolved (mw-27-20)											
1557												
1558	General Statistics											
1559	Number of Valid Data	3									Number of Detected Data	2
1560	Number of Distinct Detected Data	2									Number of Non-Detect Data	1
1561											Percent Non-Detects	33.33%
1562												
1563	Warning: This data set only has 3 observations!											
1564	Data set is too small to compute reliable and meaningful statistics and estimates!											
1565	The data set for variable Vanadium, dissolved (mw-27-20) was not processed!											
1566												
1567	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1568	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1569												
1570												
1571												
1572	Vanadium, dissolved (mw-28-25)											
1573												
1574	General Statistics											
1575	Number of Valid Data	3									Number of Detected Data	2
1576	Number of Distinct Detected Data	2									Number of Non-Detect Data	1
1577											Percent Non-Detects	33.33%
1578												
1579	Warning: This data set only has 3 observations!											
1580	Data set is too small to compute reliable and meaningful statistics and estimates!											
1581	The data set for variable Vanadium, dissolved (mw-28-25) was not processed!											
1582												
1583	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
1584	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
1585												
1586												
1587												
1588	Vanadium, dissolved (mw-29)											
1589												
1590	General Statistics											

1591				Number of Valid Data	3					Number of Detected Data	2	
1592				Number of Distinct Detected Data	2					Number of Non-Detect Data	1	
1593										Percent Non-Detects	33.33%	
1594												
1595						Warning: This data set only has 3 observations!							
1596						Data set is too small to compute reliable and meaningful statistics and estimates!						
1597						The data set for variable Vanadium, dissolved (mw-29) was not processed!						
1598												
1599						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
1600						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
1601												
1602												
1603												
1604	Vanadium, dissolved (mw-3)											
1605												
1606						General Statistics						
1607				Number of Valid Observations	2					Number of Distinct Observations	2	
1608												
1609												
1610						Warning: This data set only has 2 observations!						
1611						Data set is too small to compute reliable and meaningful statistics and estimates!						
1612						The data set for variable Vanadium, dissolved (mw-3) was not processed!						
1613												
1614						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
1615						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
1616												
1617												
1618												
1619	Vanadium, dissolved (mw-30-30)											
1620												
1621						General Statistics						
1622				Number of Valid Data	4					Number of Detected Data	1	
1623				Number of Distinct Detected Data	1					Number of Non-Detect Data	3	
1624										Percent Non-Detects	75.00%	
1625												
1626						Warning: This data set only has 4 observations!						
1627						Data set is too small to compute reliable and meaningful statistics and estimates!						
1628						The data set for variable Vanadium, dissolved (mw-30-30) was not processed!						
1629												
1630						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
1631						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
1632												
1633												
1634												
1635	Vanadium, dissolved (mw-31-135)											
1636												
1637						General Statistics						
1638				Number of Valid Observations	1					Number of Distinct Observations	1	
1639												
1640												
1641						Warning: This data set only has 1 observations!						
1642						Data set is too small to compute reliable and meaningful statistics and estimates!						
1643						The data set for variable Vanadium, dissolved (mw-31-135) was not processed!						

	A	B	C	D	E	F	G	H	I	J	K	L
1644												
1645	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1646	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1647												
1648												
1649												
1650	**Vanadium, dissolved (mw-31-60)**											
1651												
1652	**General Statistics**											
1653						Number of Valid Data	5			Number of Detected Data	4	
1654						Number of Distinct Detected Data	4			Number of Non-Detect Data	1	
1655										Percent Non-Detects	20.00%	
1656												
1657	**Raw Statistics**							**Log-transformed Statistics**				
1658						Minimum Detected	0.0058			Minimum Detected	-5.15	
1659						Maximum Detected	0.118			Maximum Detected	-2.137	
1660						Mean of Detected	0.0459			Mean of Detected	-3.732	
1661						SD of Detected	0.0521			SD of Detected	1.406	
1662						Minimum Non-Detect	0.005			Minimum Non-Detect	-5.298	
1663						Maximum Non-Detect	0.005			Maximum Non-Detect	-5.298	
1664												
1665												
1666	**Warning: There are only 4 Distinct Detected Values in this data**											
1667	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1668	**the resulting calculations may not be reliable enough tp draw conclusions**											
1669												
1670	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1671												
1672												
1673	**UCL Statistics**											
1674	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
1675						Shapiro Wilk Test Statistic	0.864			Shapiro Wilk Test Statistic	0.929	
1676						5% Shapiro Wilk Critical Value	0.748			5% Shapiro Wilk Critical Value	0.748	
1677	**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
1678												
1679	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
1680						DL/2 Substitution Method				DL/2 Substitution Method		
1681						Mean	0.0372			Mean	-4.184	
1682						SD	0.0491			SD	1.582	
1683						95% DL/2 (t) UCL	0.084			95% H-Stat (DL/2) UCL	2.118	
1684												
1685						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		
1686						Mean	0.0311			Mean in Log Scale	-4.479	
1687						SD	0.0514			SD in Log Scale	2.067	
1688						95% MLE (t) UCL	0.0801			Mean in Original Scale	0.0368	
1689						95% MLE (Tiku) UCL	0.0799			SD in Original Scale	0.0494	
1690										95% Percentile Bootstrap UCL	0.0731	
1691										95% BCA Bootstrap UCL	0.0809	
1692												
1693	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
1694						k star (bias corrected)	0.392	**Data appear Normal at 5% Significance Level**				
1695						Theta Star	0.117					
1696						nu star	3.133					

1697												
1698					A-D Test Statistic	0.323	**Nonparametric Statistics**					
1699					5% A-D Critical Value	0.668				Kaplan-Meier (KM) Method		
1700					K-S Test Statistic	0.668				Mean		0.0378
1701					5% K-S Critical Value	0.403				SD		0.0434
1702				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean		0.0224
1703										95% KM (t) UCL		0.0856
1704				**Assuming Gamma Distribution**						95% KM (z) UCL		0.0747
1705				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.084
1706					Minimum	1E-09				95% KM (bootstrap t) UCL		0.0967
1707					Maximum	0.118				95% KM (BCA) UCL		0.0772
1708					Mean	0.0367				95% KM (Percentile Bootstrap) UCL		0.0772
1709					Median	0.0096				95% KM (Chebyshev) UCL		0.136
1710					SD	0.0496				97.5% KM (Chebyshev) UCL		0.178
1711					k star	0.211				99% KM (Chebyshev) UCL		0.261
1712					Theta star	0.174						
1713					Nu star	2.107	**Potential UCLs to Use**					
1714					AppChi2	0.166				95% KM (t) UCL		0.0856
1715					95% Gamma Approximate UCL	0.466				95% KM (Percentile Bootstrap) UCL		0.0772
1716					95% Adjusted Gamma UCL	N/A						
1717	**Note: DL/2 is not a recommended method.**											
1718												
1719												
1720	**Vanadium, dissolved (mw-32-35)**											
1721												
1722	**General Statistics**											
1723					Number of Valid Data	3				Number of Detected Data		0
1724					Number of Distinct Detected Data	0				Number of Non-Detect Data		3
1725										Percent Non-Detects		100.00%
1726												
1727	**Warning: This data set only has 3 observations!**											
1728	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1729	**The data set for variable Vanadium, dissolved (mw-32-35) was not processed!**											
1730												
1731	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1732	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1733												
1734												
1735												
1736	**Vanadium, dissolved (mw-33-210)**											
1737												
1738	**General Statistics**											
1739					Number of Valid Observations	1				Number of Distinct Observations		1
1740												
1741												
1742	**Warning: This data set only has 1 observations!**											
1743	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1744	**The data set for variable Vanadium, dissolved (mw-33-210) was not processed!**											
1745												
1746	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1747	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1748												
1749												

	A	B	C	D	E	F	G	H	I	J	K	L
1750												
1751	**Vanadium, dissolved (mw-33-90)**											
1752												
1753	**General Statistics**											
1754	Number of Valid Observations					1	Number of Distinct Observations					1
1755												
1756												
1757	**Warning: This data set only has 1 observations!**											
1758	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1759	**The data set for variable Vanadium, dissolved (mw-33-90) was not processed!**											
1760												
1761	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1762	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1763												
1764												
1765												
1766	**Vanadium, dissolved (mw-34-100)**											
1767												
1768	**General Statistics**											
1769	Number of Valid Observations					2	Number of Distinct Observations					2
1770												
1771												
1772	**Warning: This data set only has 2 observations!**											
1773	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1774	**The data set for variable Vanadium, dissolved (mw-34-100) was not processed!**											
1775												
1776	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1777	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1778												
1779												
1780												
1781	**Vanadium, dissolved (mw-34-55)**											
1782												
1783	**General Statistics**											
1784	Number of Valid Data					9	Number of Detected Data					5
1785	Number of Distinct Detected Data					5	Number of Non-Detect Data					4
1786							Percent Non-Detects					44.44%
1787												
1788	**Raw Statistics**						**Log-transformed Statistics**					
1789	Minimum Detected					0.00115	Minimum Detected					-6.768
1790	Maximum Detected					0.227	Maximum Detected					-1.483
1791	Mean of Detected					0.0488	Mean of Detected					-4.859
1792	SD of Detected					0.0996	SD of Detected					2.03
1793	Minimum Non-Detect					0.001	Minimum Non-Detect					-6.908
1794	Maximum Non-Detect					0.005	Maximum Non-Detect					-5.298
1795												
1796	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					6
1797	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					3
1798	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					66.67%
1799												
1800	**Warning: There are only 5 Detected Values in this data**											
1801	**Note: It should be noted that even though bootstrap may be performed on this data set**											
1802	**the resulting calculations may not be reliable enough tp draw conclusions**											

	A	B	C	D	E	F	G	H	I	J	K	L
1803												
1804	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
1805												
1806												
1807	**UCL Statistics**											
1808	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1809	Shapiro Wilk Test Statistic					0.576	Shapiro Wilk Test Statistic					0.864
1810	5% Shapiro Wilk Critical Value					0.762	5% Shapiro Wilk Critical Value					0.762
1811	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1812												
1813	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1814	DL/2 Substitution Method						DL/2 Substitution Method					
1815	Mean					0.0278	Mean					-5.654
1816	SD					0.0747	SD					1.768
1817	95% DL/2 (t) UCL					0.0741	95% H-Stat (DL/2) UCL					0.297
1818												
1819	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
1820	**MLE yields a negative mean**						Mean in Log Scale					-6.245
1821							SD in Log Scale					2.307
1822							Mean in Original Scale					0.0274
1823							SD in Original Scale					0.0749
1824							95% Percentile Bootstrap UCL					0.0769
1825							95% BCA Bootstrap UCL					0.102
1826												
1827	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1828	k star (bias corrected)					0.279	**Data appear Lognormal at 5% Significance Level**					
1829	Theta Star					0.175						
1830	nu star					2.787						
1831												
1832	A-D Test Statistic					0.765	**Nonparametric Statistics**					
1833	5% A-D Critical Value					0.73	Kaplan-Meier (KM) Method					
1834	K-S Test Statistic					0.73	Mean					0.0278
1835	5% K-S Critical Value					0.377	SD					0.0705
1836	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0263
1837							95% KM (t) UCL					0.0766
1838	**Assuming Gamma Distribution**						95% KM (z) UCL					0.071
1839	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0738
1840	Minimum					0.00115	95% KM (bootstrap t) UCL					1.052
1841	Maximum					0.227	95% KM (BCA) UCL					0.08
1842	Mean					0.0437	95% KM (Percentile Bootstrap) UCL					0.0774
1843	Median					0.0241	95% KM (Chebyshev) UCL					0.142
1844	SD					0.0715	97.5% KM (Chebyshev) UCL					0.192
1845	k star					0.464	99% KM (Chebyshev) UCL					0.289
1846	Theta star					0.0942						
1847	Nu star					8.349	**Potential UCLs to Use**					
1848	AppChi2					2.939	99% KM (Chebyshev) UCL					0.289
1849	95% Gamma Approximate UCL					0.124						
1850	95% Adjusted Gamma UCL					0.158						
1851	**Warning: Recommended UCL exceeds the maximum observation**											
1852	**Note: DL/2 is not a recommended method.**											
1853												
1854												
1855	**Vanadium, dissolved (mw-34-80)**											

1856												
1857	**General Statistics**											
1858					Number of Valid Data	13				Number of Detected Data		10
1859					Number of Distinct Detected Data	10				Number of Non-Detect Data		3
1860										Percent Non-Detects		23.08%
1861												
1862	**Raw Statistics**							**Log-transformed Statistics**				
1863					Minimum Detected	0.0016				Minimum Detected		-6.438
1864					Maximum Detected	0.238				Maximum Detected		-1.435
1865					Mean of Detected	0.0282				Mean of Detected		-5.299
1866					SD of Detected	0.0739				SD of Detected		1.587
1867					Minimum Non-Detect	0.003				Minimum Non-Detect		-5.809
1868					Maximum Non-Detect	0.005				Maximum Non-Detect		-5.298
1869												
1870	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		10
1871	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		3
1872	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		76.92%
1873												
1874	**UCL Statistics**											
1875	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
1876					Shapiro Wilk Test Statistic	0.415				Shapiro Wilk Test Statistic		0.738
1877					5% Shapiro Wilk Critical Value	0.842				5% Shapiro Wilk Critical Value		0.842
1878	**Data not Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**				
1879												
1880	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
1881					DL/2 Substitution Method					DL/2 Substitution Method		
1882					Mean	0.0221				Mean		-5.537
1883					SD	0.065				SD		1.452
1884					95% DL/2 (t) UCL	0.0543				95% H-Stat (DL/2) UCL		0.0405
1885												
1886					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1887	**MLE yields a negative mean**									Mean in Log Scale		-5.446
1888										SD in Log Scale		1.418
1889										Mean in Original Scale		0.0224
1890										SD in Original Scale		0.0649
1891										95% Percentile Bootstrap UCL		0.0576
1892										95% BCA Bootstrap UCL		0.0766
1893												
1894	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
1895					k star (bias corrected)	0.335		**Data do not follow a Discernable Distribution (0.05)**				
1896					Theta Star	0.0843						
1897					nu star	6.694						
1898												
1899					A-D Test Statistic	1.838		**Nonparametric Statistics**				
1900					5% A-D Critical Value	0.798				Kaplan-Meier (KM) Method		
1901					K-S Test Statistic	0.798				Mean		0.0222
1902					5% K-S Critical Value	0.285				SD		0.0624
1903	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.0183
1904										95% KM (t) UCL		0.0547
1905	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0522
1906					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.0543
1907					Minimum	0.0016				95% KM (bootstrap t) UCL		0.415
1908					Maximum	0.238				95% KM (BCA) UCL		0.0585

1909				Mean	0.0287				95% KM (Percentile Bootstrap) UCL			0.0576
1910				Median	0.00294				95% KM (Chebyshev) UCL			0.102
1911				SD	0.064				97.5% KM (Chebyshev) UCL			0.136
1912				k star	0.42				99% KM (Chebyshev) UCL			0.204
1913				Theta star	0.0682							
1914				Nu star	10.92				**Potential UCLs to Use**			
1915				AppChi2	4.522				99% KM (Chebyshev) UCL			0.204
1916				95% Gamma Approximate UCL	0.0692							
1917				95% Adjusted Gamma UCL	0.0791							
1918	**Note: DL/2 is not a recommended method.**											
1919												
1920												
1921	**Vanadium, dissolved (mw-35-135)**											
1922												
1923	**General Statistics**											
1924				Number of Valid Observations	2				Number of Distinct Observations			2
1925												
1926												
1927	**Warning: This data set only has 2 observations!**											
1928	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1929	**The data set for variable Vanadium, dissolved (mw-35-135) was not processed!**											
1930												
1931	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1932	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1933												
1934												
1935												
1936	**Vanadium, dissolved (mw-35-60)**											
1937												
1938	**General Statistics**											
1939				Number of Valid Observations	1				Number of Distinct Observations			1
1940												
1941												
1942	**Warning: This data set only has 1 observations!**											
1943	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
1944	**The data set for variable Vanadium, dissolved (mw-35-60) was not processed!**											
1945												
1946	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
1947	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
1948												
1949												
1950												
1951	**Vanadium, dissolved (mw-37d)**											
1952												
1953	**General Statistics**											
1954				Number of Valid Data	13				Number of Detected Data			11
1955				Number of Distinct Detected Data	11				Number of Non-Detect Data			2
1956									Percent Non-Detects			15.38%
1957												
1958	**Raw Statistics**								**Log-transformed Statistics**			
1959				Minimum Detected	0.004				Minimum Detected			-5.521
1960				Maximum Detected	0.326				Maximum Detected			-1.121
1961				Mean of Detected	0.038				Mean of Detected			-4.568

1962				SD of Detected	0.0959					SD of Detected	1.282	
1963				Minimum Non-Detect	0.003					Minimum Non-Detect	-5.809	
1964				Maximum Non-Detect	0.003					Maximum Non-Detect	-5.809	
1965												
1966												
1967	**UCL Statistics**											
1968	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1969				Shapiro Wilk Test Statistic	0.399					Shapiro Wilk Test Statistic	0.678	
1970				5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85	
1971	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1972												
1973	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1974				DL/2 Substitution Method						DL/2 Substitution Method		
1975				Mean	0.0324					Mean	-4.866	
1976				SD	0.0886					SD	1.378	
1977				95% DL/2 (t) UCL	0.0761					95% H-Stat (DL/2) UCL	0.0814	
1978												
1979				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
1980				Mean	0.022					Mean in Log Scale	-4.973	
1981				SD	0.0944					SD in Log Scale	1.536	
1982				95% MLE (t) UCL	0.0687					Mean in Original Scale	0.0322	
1983				95% MLE (Tiku) UCL	0.0662					SD in Original Scale	0.0886	
1984										95% Percentile Bootstrap UCL	0.08	
1985										95% BCA Bootstrap UCL	0.106	
1986												
1987	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1988				k star (bias corrected)	0.418		**Data do not follow a Discernable Distribution (0.05)**					
1989				Theta Star	0.0909							
1990				nu star	9.191							
1991												
1992				A-D Test Statistic	2.316		**Nonparametric Statistics**					
1993				5% A-D Critical Value	0.783					Kaplan-Meier (KM) Method		
1994				K-S Test Statistic	0.783					Mean	0.0327	
1995				5% K-S Critical Value	0.269					SD	0.085	
1996	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0247	
1997										95% KM (t) UCL	0.0768	
1998	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0734	
1999				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0763	
2000				Minimum	1E-09					95% KM (bootstrap t) UCL	0.903	
2001				Maximum	0.326					95% KM (BCA) UCL	0.0814	
2002				Mean	0.0321					95% KM (Percentile Bootstrap) UCL	0.0811	
2003				Median	0.00608					95% KM (Chebyshev) UCL	0.14	
2004				SD	0.0887					97.5% KM (Chebyshev) UCL	0.187	
2005				k star	0.207					99% KM (Chebyshev) UCL	0.279	
2006				Theta star	0.155							
2007				Nu star	5.395		**Potential UCLs to Use**					
2008				AppChi2	1.339					97.5% KM (Chebyshev) UCL	0.187	
2009				95% Gamma Approximate UCL	0.129							
2010				95% Adjusted Gamma UCL	0.161							
2011	**Note: DL/2 is not a recommended method.**											
2012												
2013												
2014	**Vanadium, dissolved (mw-37s)**											

	A	B	C	D	E	F	G	H	I	J	K	L
2015												
2016	General Statistics											
2017	Number of Valid Observations					1	Number of Distinct Observations					1
2018												
2019												
2020	Warning: This data set only has 1 observations!											
2021	Data set is too small to compute reliable and meaningful statistics and estimates!											
2022	The data set for variable Vanadium, dissolved (mw-37s) was not processed!											
2023												
2024	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2025	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2026												
2027												
2028												
2029	Vanadium, dissolved (mw-38d)											
2030												
2031	General Statistics											
2032	Number of Valid Observations					1	Number of Distinct Observations					1
2033												
2034												
2035	Warning: This data set only has 1 observations!											
2036	Data set is too small to compute reliable and meaningful statistics and estimates!											
2037	The data set for variable Vanadium, dissolved (mw-38d) was not processed!											
2038												
2039	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2040	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2041												
2042												
2043												
2044	Vanadium, dissolved (mw-38s)											
2045												
2046	General Statistics											
2047	Number of Valid Observations					1	Number of Distinct Observations					1
2048												
2049												
2050	Warning: This data set only has 1 observations!											
2051	Data set is too small to compute reliable and meaningful statistics and estimates!											
2052	The data set for variable Vanadium, dissolved (mw-38s) was not processed!											
2053												
2054	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2055	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2056												
2057												
2058												
2059	Vanadium, dissolved (mw-39-60)											
2060												
2061	General Statistics											
2062	Number of Valid Observations					1	Number of Distinct Observations					1
2063												
2064												
2065	Warning: This data set only has 1 observations!											
2066	Data set is too small to compute reliable and meaningful statistics and estimates!											
2067	The data set for variable Vanadium, dissolved (mw-39-60) was not processed!											

	A	B	C	D	E	F	G	H	I	J	K	L
2068												
2069	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2070	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2071												
2072												
2073												
2074	Vanadium, dissolved (mw-4)											
2075												
2076	General Statistics											
2077	Number of Valid Observations	2				Number of Distinct Observations	2					
2078												
2079												
2080	Warning: This data set only has 2 observations!											
2081	Data set is too small to compute reliable and meaningful statistics and estimates!											
2082	The data set for variable Vanadium, dissolved (mw-4) was not processed!											
2083												
2084	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2085	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2086												
2087												
2088												
2089	Vanadium, dissolved (mw-40d)											
2090												
2091	General Statistics											
2092	Number of Valid Observations	1				Number of Distinct Observations	1					
2093												
2094												
2095	Warning: This data set only has 1 observations!											
2096	Data set is too small to compute reliable and meaningful statistics and estimates!											
2097	The data set for variable Vanadium, dissolved (mw-40d) was not processed!											
2098												
2099	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2100	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2101												
2102												
2103												
2104	Vanadium, dissolved (mw-40s)											
2105												
2106	General Statistics											
2107	Number of Valid Observations	1				Number of Distinct Observations	1					
2108												
2109												
2110	Warning: This data set only has 1 observations!											
2111	Data set is too small to compute reliable and meaningful statistics and estimates!											
2112	The data set for variable Vanadium, dissolved (mw-40s) was not processed!											
2113												
2114	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2115	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2116												
2117												
2118												
2119	Vanadium, dissolved (mw-43-25)											
2120												

	A	B	C	D	E	F	G	H	I	J	K	L
2121	**General Statistics**											
2122					Number of Valid Data	3				Number of Detected Data		0
2123					Number of Distinct Detected Data	0				Number of Non-Detect Data		3
2124										Percent Non-Detects		100.00%
2125												
2126	**Warning: This data set only has 3 observations!**											
2127	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2128	**The data set for variable Vanadium, dissolved (mw-43-25) was not processed!**											
2129												
2130	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2131	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2132												
2133												
2134												
2135	**Vanadium, dissolved (mw-44-115)**											
2136												
2137	**General Statistics**											
2138					Number of Valid Observations	3				Number of Distinct Observations		3
2139												
2140												
2141	**Warning: This data set only has 3 observations!**											
2142	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2143	**The data set for variable Vanadium, dissolved (mw-44-115) was not processed!**											
2144												
2145	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2146	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2147												
2148												
2149												
2150	**Vanadium, dissolved (mw-44-125)**											
2151												
2152	**General Statistics**											
2153					Number of Valid Data	1				Number of Detected Data		0
2154					Number of Distinct Detected Data	0				Number of Non-Detect Data		1
2155										Percent Non-Detects		100.00%
2156												
2157	**Warning: This data set only has 1 observations!**											
2158	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2159	**The data set for variable Vanadium, dissolved (mw-44-125) was not processed!**											
2160												
2161	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2162	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2163												
2164												
2165												
2166	**Vanadium, dissolved (mw-45-095a)**											
2167												
2168	**General Statistics**											
2169					Number of Valid Observations	1				Number of Distinct Observations		1
2170												
2171												
2172	**Warning: This data set only has 1 observations!**											
2173	**Data set is too small to compute reliable and meaningful statistics and estimates!**											

	A	B	C	D	E	F	G	H	I	J	K	L
2174	The data set for variable Vanadium, dissolved (mw-45-095a) was not processed!											
2175												
2176	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2177	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2178												
2179												
2180												
2181	Vanadium, dissolved (mw-46-175)											
2182												
2183	General Statistics											
2184					Number of Valid Observations	1			Number of Distinct Observations	1		
2185												
2186												
2187	Warning: This data set only has 1 observations!											
2188	Data set is too small to compute reliable and meaningful statistics and estimates!											
2189	The data set for variable Vanadium, dissolved (mw-46-175) was not processed!											
2190												
2191	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2192	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2193												
2194												
2195												
2196	Vanadium, dissolved (mw-47-55)											
2197												
2198	General Statistics											
2199					Number of Valid Observations	1			Number of Distinct Observations	1		
2200												
2201												
2202	Warning: This data set only has 1 observations!											
2203	Data set is too small to compute reliable and meaningful statistics and estimates!											
2204	The data set for variable Vanadium, dissolved (mw-47-55) was not processed!											
2205												
2206	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2207	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2208												
2209												
2210												
2211	Vanadium, dissolved (mw-48)											
2212												
2213	General Statistics											
2214					Number of Valid Data	3			Number of Detected Data	2		
2215					Number of Distinct Detected Data	2			Number of Non-Detect Data	1		
2216									Percent Non-Detects	33.33%		
2217												
2218	Warning: This data set only has 3 observations!											
2219	Data set is too small to compute reliable and meaningful statistics and estimates!											
2220	The data set for variable Vanadium, dissolved (mw-48) was not processed!											
2221												
2222	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2223	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2224												
2225												
2226												

	A	B	C	D	E	F	G	H	I	J	K	L
2227	**Vanadium, dissolved (mw-5)**											
2228												
2229	**General Statistics**											
2230	Number of Valid Observations					2	Number of Distinct Observations					2
2231												
2232												
2233	**Warning: This data set only has 2 observations!**											
2234	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2235	**The data set for variable Vanadium, dissolved (mw-5) was not processed!**											
2236												
2237	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2238	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2239												
2240												
2241												
2242	**Vanadium, dissolved (mw-50-200)**											
2243												
2244	**General Statistics**											
2245	Number of Valid Data					3	Number of Detected Data					0
2246	Number of Distinct Detected Data					0	Number of Non-Detect Data					3
2247							Percent Non-Detects					100.00%
2248												
2249	**Warning: This data set only has 3 observations!**											
2250	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2251	**The data set for variable Vanadium, dissolved (mw-50-200) was not processed!**											
2252												
2253	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2254	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2255												
2256												
2257												
2258	**Vanadium, dissolved (mw-51)**											
2259												
2260	**General Statistics**											
2261	Number of Valid Data					3	Number of Detected Data					0
2262	Number of Distinct Detected Data					0	Number of Non-Detect Data					3
2263							Percent Non-Detects					100.00%
2264												
2265	**Warning: This data set only has 3 observations!**											
2266	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2267	**The data set for variable Vanadium, dissolved (mw-51) was not processed!**											
2268												
2269	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2270	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2271												
2272												
2273												
2274	**Vanadium, dissolved (mw-6)**											
2275												
2276	**General Statistics**											
2277	Number of Valid Observations					2	Number of Distinct Observations					2
2278												
2279												

	A	B	C	D	E	F	G	H	I	J	K	L
2280	**Warning: This data set only has 2 observations!**											
2281	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2282	**The data set for variable Vanadium, dissolved (mw-6) was not processed!**											
2283												
2284	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2285	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2286												
2287												
2288												
2289	**Vanadium, dissolved (mw-7)**											
2290												
2291	**General Statistics**											
2292	Number of Valid Observations	2				Number of Distinct Observations	2					
2293												
2294												
2295	**Warning: This data set only has 2 observations!**											
2296	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2297	**The data set for variable Vanadium, dissolved (mw-7) was not processed!**											
2298												
2299	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2300	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2301												
2302												
2303												
2304	**Vanadium, dissolved (mw-8)**											
2305												
2306	**General Statistics**											
2307	Number of Valid Observations	2				Number of Distinct Observations	2					
2308												
2309												
2310	**Warning: This data set only has 2 observations!**											
2311	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2312	**The data set for variable Vanadium, dissolved (mw-8) was not processed!**											
2313												
2314	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2315	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2316												
2317												
2318												
2319	**Vanadium, dissolved (mw-9)**											
2320												
2321	**General Statistics**											
2322	Number of Valid Observations	5				Number of Distinct Observations	5					
2323												
2324	**Raw Statistics**					**Log-transformed Statistics**						
2325	Minimum	0.0077				Minimum of Log Data	-4.867					
2326	Maximum	0.014				Maximum of Log Data	-4.269					
2327	Mean	0.0103				Mean of log Data	-4.606					
2328	Median	0.0094				SD of log Data	0.264					
2329	SD	0.00276										
2330	Coefficient of Variation	0.269										
2331	Skewness	0.593										
2332												

2333												
2334	**Warning: A sample size of 'n' = 5 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
2335												
2336	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
2337	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2338												
2339												
2340	**Warning: There are only 5 Values in this data**											
2341	**Note: It should be noted that even though bootstrap methods may be performed on this data set,**											
2342	**the resulting calculations may not be reliable enough to draw conclusions**											
2343												
2344	**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**											
2345												
2346	**Relevant UCL Statistics**											
2347	**Normal Distribution Test**						**Lognormal Distribution Test**					
2348				Shapiro Wilk Test Statistic	0.894					Shapiro Wilk Test Statistic	0.903	
2349				Shapiro Wilk Critical Value	0.762					Shapiro Wilk Critical Value	0.762	
2350	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2351												
2352	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2353				95% Student's-t UCL	0.0129					95% H-UCL	0.0141	
2354	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	0.0155	
2355				95% Adjusted-CLT UCL	0.0127					97.5% Chebyshev (MVUE) UCL	0.0178	
2356				95% Modified-t UCL	0.013					99% Chebyshev (MVUE) UCL	0.0223	
2357												
2358	**Gamma Distribution Test**						**Data Distribution**					
2359				k star (bias corrected)	7.293		**Data appear Normal at 5% Significance Level**					
2360				Theta Star	0.00141							
2361				nu star	72.93							
2362				Approximate Chi Square Value (.05)	54.26		**Nonparametric Statistics**					
2363				Adjusted Level of Significance	0.0086					95% CLT UCL	0.0123	
2364				Adjusted Chi Square Value	47.29					95% Jackknife UCL	0.0129	
2365										95% Standard Bootstrap UCL	0.0121	
2366				Anderson-Darling Test Statistic	0.366					95% Bootstrap-t UCL	0.016	
2367				Anderson-Darling 5% Critical Value	0.679					95% Hall's Bootstrap UCL	0.0167	
2368				Kolmogorov-Smirnov Test Statistic	0.226					95% Percentile Bootstrap UCL	0.0121	
2369				Kolmogorov-Smirnov 5% Critical Value	0.357					95% BCA Bootstrap UCL	0.0122	
2370	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	0.0157	
2371										97.5% Chebyshev(Mean, Sd) UCL	0.018	
2372	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	0.0226	
2373				95% Approximate Gamma UCL	0.0138							
2374				95% Adjusted Gamma UCL	0.0159							
2375												
2376	**Potential UCL to Use**									Use 95% Student's-t UCL	0.0129	
2377												
2378												
2379	**Vanadium, dissolved (ow-1d)**											
2380												
2381	**General Statistics**											
2382				Number of Valid Data	15					Number of Detected Data	14	
2383				Number of Distinct Detected Data	14					Number of Non-Detect Data	1	
2384										Percent Non-Detects	6.67%	
2385												

	A	B	C	D	E	F	G	H	I	J	K	L
2386	**Raw Statistics**						**Log-transformed Statistics**					
2387					Minimum Detected	0.00169					Minimum Detected	-6.383
2388					Maximum Detected	0.122					Maximum Detected	-2.104
2389					Mean of Detected	0.0236					Mean of Detected	-4.372
2390					SD of Detected	0.0336					SD of Detected	1.102
2391					Minimum Non-Detect	0.003					Minimum Non-Detect	-5.809
2392					Maximum Non-Detect	0.003					Maximum Non-Detect	-5.809
2393												
2394												
2395	**UCL Statistics**											
2396	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2397					Shapiro Wilk Test Statistic	0.618					Shapiro Wilk Test Statistic	0.954
2398					5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value	0.874
2399	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2400												
2401	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2402					DL/2 Substitution Method						DL/2 Substitution Method	
2403					Mean	0.0221					Mean	-4.514
2404					SD	0.0328					SD	1.196
2405					95% DL/2 (t) UCL	0.0371					95% H-Stat (DL/2) UCL	0.0425
2406												
2407					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2408					Mean	0.0193					Mean in Log Scale	-4.51
2409					SD	0.0349					SD in Log Scale	1.188
2410					95% MLE (t) UCL	0.0352					Mean in Original Scale	0.0221
2411					95% MLE (Tiku) UCL	0.0344					SD in Original Scale	0.0328
2412											95% Percentile Bootstrap UCL	0.0367
2413											95% BCA Bootstrap UCL	0.0431
2414												
2415	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2416					k star (bias corrected)	0.778	**Data appear Lognormal at 5% Significance Level**					
2417					Theta Star	0.0303						
2418					nu star	21.8						
2419												
2420					A-D Test Statistic	0.878	**Nonparametric Statistics**					
2421					5% A-D Critical Value	0.763	Kaplan-Meier (KM) Method					
2422					K-S Test Statistic	0.763					Mean	0.0221
2423					5% K-S Critical Value	0.236					SD	0.0317
2424	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0085
2425											95% KM (t) UCL	0.0371
2426	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0361
2427	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0369
2428					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0847
2429					Maximum	0.122					95% KM (BCA) UCL	0.0367
2430					Mean	0.022					95% KM (Percentile Bootstrap) UCL	0.0365
2431					Median	0.0108					95% KM (Chebyshev) UCL	0.0592
2432					SD	0.0329					97.5% KM (Chebyshev) UCL	0.0752
2433					k star	0.364					99% KM (Chebyshev) UCL	0.107
2434					Theta star	0.0605						
2435					Nu star	10.92	**Potential UCLs to Use**					
2436					AppChi2	4.527					97.5% KM (Chebyshev) UCL	0.0752
2437					95% Gamma Approximate UCL	0.0532						
2438					95% Adjusted Gamma UCL	0.0597						

2439	Note: DL/2 is not a recommended method.											
2440												
2441												
2442	Vanadium, dissolved (ow-1m)											
2443												
2444					General Statistics							
2445				Number of Valid Data	14			Number of Detected Data	12			
2446				Number of Distinct Detected Data	11			Number of Non-Detect Data	2			
2447								Percent Non-Detects	14.29%			
2448												
2449				Raw Statistics				Log-transformed Statistics				
2450				Minimum Detected	0.00184			Minimum Detected	-6.298			
2451				Maximum Detected	0.0625			Maximum Detected	-2.773			
2452				Mean of Detected	0.0181			Mean of Detected	-4.481			
2453				SD of Detected	0.0192			SD of Detected	1.035			
2454				Minimum Non-Detect	0.005			Minimum Non-Detect	-5.298			
2455				Maximum Non-Detect	0.005			Maximum Non-Detect	-5.298			
2456												
2457												
2458					UCL Statistics							
2459				Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only				
2460				Shapiro Wilk Test Statistic	0.732			Shapiro Wilk Test Statistic	0.951			
2461				5% Shapiro Wilk Critical Value	0.859			5% Shapiro Wilk Critical Value	0.859			
2462				Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level				
2463												
2464				Assuming Normal Distribution				Assuming Lognormal Distribution				
2465				DL/2 Substitution Method				DL/2 Substitution Method				
2466				Mean	0.0158			Mean	-4.696			
2467				SD	0.0185			SD	1.099			
2468				95% DL/2 (t) UCL	0.0246			95% H-Stat (DL/2) UCL	0.0333			
2469												
2470				Maximum Likelihood Estimate(MLE) Method				Log ROS Method				
2471				Mean	0.0122			Mean in Log Scale	-4.706			
2472				SD	0.0222			SD in Log Scale	1.116			
2473				95% MLE (t) UCL	0.0227			Mean in Original Scale	0.0158			
2474				95% MLE (Tiku) UCL	0.0231			SD in Original Scale	0.0186			
2475								95% Percentile Bootstrap UCL	0.0239			
2476								95% BCA Bootstrap UCL	0.0257			
2477												
2478				Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only				
2479				k star (bias corrected)	0.964			Data appear Gamma Distributed at 5% Significance Level				
2480				Theta Star	0.0187							
2481				nu star	23.15							
2482												
2483				A-D Test Statistic	0.513			Nonparametric Statistics				
2484				5% A-D Critical Value	0.752			Kaplan-Meier (KM) Method				
2485				K-S Test Statistic	0.752			Mean	0.0158			
2486				5% K-S Critical Value	0.251			SD	0.0179			
2487				Data appear Gamma Distributed at 5% Significance Level				SE of Mean	0.00499			
2488								95% KM (t) UCL	0.0247			
2489				Assuming Gamma Distribution				95% KM (z) UCL	0.024			
2490				Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL	0.0246			
2491				Minimum	1E-09			95% KM (bootstrap t) UCL	0.0386			

2492					Maximum	0.0625					95% KM (BCA) UCL	0.0247
2493					Mean	0.0157					95% KM (Percentile Bootstrap) UCL	0.0244
2494					Median	0.0122					95% KM (Chebyshev) UCL	0.0376
2495					SD	0.0187					97.5% KM (Chebyshev) UCL	0.047
2496					k star	0.372					99% KM (Chebyshev) UCL	0.0655
2497					Theta star	0.0421						
2498					Nu star	10.42					**Potential UCLs to Use**	
2499					AppChi2	4.204					95% KM (Chebyshev) UCL	0.0376
2500					95% Gamma Approximate UCL	0.0388						
2501					95% Adjusted Gamma UCL	0.0442						
2502	**Note: DL/2 is not a recommended method.**											
2503												
2504												
2505	**Vanadium, dissolved (ow-1s)**											
2506												
2507					**General Statistics**							
2508					Number of Valid Data	13					Number of Detected Data	10
2509					Number of Distinct Detected Data	10					Number of Non-Detect Data	3
2510											Percent Non-Detects	23.08%
2511												
2512					**Raw Statistics**						**Log-transformed Statistics**	
2513					Minimum Detected	0.00244					Minimum Detected	-6.016
2514					Maximum Detected	0.0564					Maximum Detected	-2.875
2515					Mean of Detected	0.0146					Mean of Detected	-4.651
2516					SD of Detected	0.0164					SD of Detected	0.926
2517					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
2518					Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298
2519												
2520												
2521					**UCL Statistics**							
2522					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
2523					Shapiro Wilk Test Statistic	0.705					Shapiro Wilk Test Statistic	0.963
2524					5% Shapiro Wilk Critical Value	0.842					5% Shapiro Wilk Critical Value	0.842
2525					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
2526												
2527					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2528					DL/2 Substitution Method						DL/2 Substitution Method	
2529					Mean	0.0118					Mean	-4.96
2530					SD	0.0151					SD	0.994
2531					95% DL/2 (t) UCL	0.0193					95% H-Stat (DL/2) UCL	0.0241
2532												
2533					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2534					Mean	0.00681					Mean in Log Scale	-4.962
2535					SD	0.0198					SD in Log Scale	1.011
2536					95% MLE (t) UCL	0.0166					Mean in Original Scale	0.0118
2537					95% MLE (Tiku) UCL	0.0177					SD in Original Scale	0.0151
2538											95% Percentile Bootstrap UCL	0.0189
2539											95% BCA Bootstrap UCL	0.0225
2540												
2541					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
2542					k star (bias corrected)	0.998					**Data appear Gamma Distributed at 5% Significance Level**	
2543					Theta Star	0.0146						
2544					nu star	19.95						

2545												
2546					A-D Test Statistic	0.499	**Nonparametric Statistics**					
2547					5% A-D Critical Value	0.742				Kaplan-Meier (KM) Method		
2548					K-S Test Statistic	0.742				Mean		0.0119
2549					5% K-S Critical Value	0.272				SD		0.0145
2550	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.00423
2551										95% KM (t) UCL		0.0194
2552	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0189
2553					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.0194
2554					Minimum	1E-09				95% KM (bootstrap t) UCL		0.0348
2555					Maximum	0.0564				95% KM (BCA) UCL		0.0202
2556					Mean	0.0121				95% KM (Percentile Bootstrap) UCL		0.0194
2557					Median	0.0068				95% KM (Chebyshev) UCL		0.0303
2558					SD	0.015				97.5% KM (Chebyshev) UCL		0.0383
2559					k star	0.373				99% KM (Chebyshev) UCL		0.054
2560					Theta star	0.0325						
2561					Nu star	9.698	**Potential UCLs to Use**					
2562					AppChi2	3.754				95% KM (Chebyshev) UCL		0.0303
2563					95% Gamma Approximate UCL	0.0313						
2564					95% Adjusted Gamma UCL	0.0362						
2565	**Note: DL/2 is not a recommended method.**											
2566												
2567												
2568	**Vanadium, dissolved (ow-2d)**											
2569												
2570	**General Statistics**											
2571					Number of Valid Data	14				Number of Detected Data		10
2572					Number of Distinct Detected Data	10				Number of Non-Detect Data		4
2573										Percent Non-Detects		28.57%
2574												
2575	**Raw Statistics**						**Log-transformed Statistics**					
2576					Minimum Detected	0.00148				Minimum Detected		-6.516
2577					Maximum Detected	0.0862				Maximum Detected		-2.451
2578					Mean of Detected	0.0233				Mean of Detected		-4.341
2579					SD of Detected	0.0261				SD of Detected		1.264
2580					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
2581					Maximum Non-Detect	0.005				Maximum Non-Detect		-5.298
2582												
2583	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		6
2584	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		8
2585	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		42.86%
2586												
2587	**UCL Statistics**											
2588	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2589					Shapiro Wilk Test Statistic	0.732				Shapiro Wilk Test Statistic		0.884
2590					5% Shapiro Wilk Critical Value	0.842				5% Shapiro Wilk Critical Value		0.842
2591	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2592												
2593	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2594					DL/2 Substitution Method					DL/2 Substitution Method		
2595					Mean	0.0172				Mean		-4.927
2596					SD	0.0239				SD		1.477
2597					95% DL/2 (t) UCL	0.0285				95% H-Stat (DL/2) UCL		0.046

2598												
2599				Maximum Likelihood Estimate(MLE) Method				Log ROS Method				
2600				Mean	0.00746			Mean in Log Scale				-5.031
2601				SD	0.0335			SD in Log Scale				1.591
2602				95% MLE (t) UCL	0.0233			Mean in Original Scale				0.0171
2603				95% MLE (Tiku) UCL	0.0257			SD in Original Scale				0.024
2604								95% Percentile Bootstrap UCL				0.0282
2605								95% BCA Bootstrap UCL				0.0312
2606												
2607				**Gamma Distribution Test with Detected Values Only**				**Data Distribution Test with Detected Values Only**				
2608				k star (bias corrected)	0.762			**Data appear Gamma Distributed at 5% Significance Level**				
2609				Theta Star	0.0306							
2610				nu star	15.24							
2611												
2612				A-D Test Statistic	0.57			**Nonparametric Statistics**				
2613				5% A-D Critical Value	0.749			Kaplan-Meier (KM) Method				
2614				K-S Test Statistic	0.749			Mean				0.0171
2615				5% K-S Critical Value	0.274			SD				0.0231
2616				**Data appear Gamma Distributed at 5% Significance Level**				SE of Mean				0.00652
2617								95% KM (t) UCL				0.0286
2618				**Assuming Gamma Distribution**				95% KM (z) UCL				0.0278
2619				Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL				0.0284
2620				Minimum	1E-09			95% KM (bootstrap t) UCL				0.0476
2621				Maximum	0.0862			95% KM (BCA) UCL				0.0303
2622				Mean	0.0184			95% KM (Percentile Bootstrap) UCL				0.0286
2623				Median	0.0139			95% KM (Chebyshev) UCL				0.0455
2624				SD	0.0235			97.5% KM (Chebyshev) UCL				0.0578
2625				k star	0.253			99% KM (Chebyshev) UCL				0.0819
2626				Theta star	0.073							
2627				Nu star	7.071			**Potential UCLs to Use**				
2628				AppChi2	2.21			95% KM (Chebyshev) UCL				0.0455
2629				95% Gamma Approximate UCL	0.059							
2630				95% Adjusted Gamma UCL	0.0698							
2631	**Note: DL/2 is not a recommended method.**											
2632												
2633												
2634	**Vanadium, dissolved (ow-2m)**											
2635												
2636							**General Statistics**					
2637				Number of Valid Data	13			Number of Detected Data				11
2638				Number of Distinct Detected Data	11			Number of Non-Detect Data				2
2639								Percent Non-Detects				15.38%
2640												
2641				**Raw Statistics**				**Log-transformed Statistics**				
2642				Minimum Detected	0.0021			Minimum Detected				-6.166
2643				Maximum Detected	0.0913			Maximum Detected				-2.394
2644				Mean of Detected	0.0202			Mean of Detected				-4.557
2645				SD of Detected	0.0273			SD of Detected				1.187
2646				Minimum Non-Detect	0.005			Minimum Non-Detect				-5.298
2647				Maximum Non-Detect	0.005			Maximum Non-Detect				-5.298
2648												
2649												
2650							**UCL Statistics**					

	A	B	C	D	E	F	G	H	I	J	K	L
2651	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2652	Shapiro Wilk Test Statistic					0.666	Shapiro Wilk Test Statistic					0.932
2653	5% Shapiro Wilk Critical Value					0.85	5% Shapiro Wilk Critical Value					0.85
2654	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2655												
2656	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2657	DL/2 Substitution Method						DL/2 Substitution Method					
2658	Mean					0.0175	Mean					-4.777
2659	SD					0.0258	SD					1.211
2660	95% DL/2 (t) UCL					0.0302	95% H-Stat (DL/2) UCL					0.0436
2661												
2662	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
2663	Mean					0.00842	Mean in Log Scale					-4.779
2664	SD					0.0342	SD in Log Scale					1.22
2665	95% MLE (t) UCL					0.0253	Mean in Original Scale					0.0175
2666	95% MLE (Tiku) UCL					0.0272	SD in Original Scale					0.0258
2667							95% Percentile Bootstrap UCL					0.0294
2668							95% BCA Bootstrap UCL					0.0361
2669												
2670	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2671	k star (bias corrected)					0.71	**Data appear Gamma Distributed at 5% Significance Level**					
2672	Theta Star					0.0285						
2673	nu star					15.62						
2674												
2675	A-D Test Statistic					0.619	**Nonparametric Statistics**					
2676	5% A-D Critical Value					0.756	Kaplan-Meier (KM) Method					
2677	K-S Test Statistic					0.756	Mean					0.0175
2678	5% K-S Critical Value					0.263	SD					0.0248
2679	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00721
2680							95% KM (t) UCL					0.0303
2681	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0293
2682	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0302
2683	Minimum					1E-09	95% KM (bootstrap t) UCL					0.0689
2684	Maximum					0.0913	95% KM (BCA) UCL					0.0325
2685	Mean					0.0174	95% KM (Percentile Bootstrap) UCL					0.0297
2686	Median					0.011	95% KM (Chebyshev) UCL					0.0489
2687	SD					0.0258	97.5% KM (Chebyshev) UCL					0.0625
2688	k star					0.333	99% KM (Chebyshev) UCL					0.0892
2689	Theta star					0.0523						
2690	Nu star					8.655	**Potential UCLs to Use**					
2691	AppChi2					3.12	95% KM (Chebyshev) UCL					0.0489
2692	95% Gamma Approximate UCL					0.0483						
2693	95% Adjusted Gamma UCL					0.0566						
2694	**Note: DL/2 is not a recommended method.**											
2695												
2696												
2697	**Vanadium, dissolved (ow-2s)**											
2698												
2699	**General Statistics**											
2700	Number of Valid Observations					13	Number of Distinct Observations					11
2701												
2702	**Raw Statistics**						**Log-transformed Statistics**					
2703	Minimum					0.0058	Minimum of Log Data					-5.15

2704					Maximum	0.0382					Maximum of Log Data	-3.265
2705					Mean	0.0112					Mean of log Data	-4.692
2706					Median	0.007					SD of log Data	0.575
2707					SD	0.00939						
2708					Coefficient of Variation	0.842						
2709					Skewness	2.474						
2710												
2711					**Relevant UCL Statistics**							
2712					**Normal Distribution Test**						**Lognormal Distribution Test**	
2713					Shapiro Wilk Test Statistic	0.612					Shapiro Wilk Test Statistic	0.768
2714					Shapiro Wilk Critical Value	0.866					Shapiro Wilk Critical Value	0.866
2715					**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**	
2716												
2717					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2718					95% Student's-t UCL	0.0158					95% H-UCL	0.0156
2719					**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0183
2720					95% Adjusted-CLT UCL	0.0174					97.5% Chebyshev (MVUE) UCL	0.0216
2721					95% Modified-t UCL	0.0161					99% Chebyshev (MVUE) UCL	0.0281
2722												
2723					**Gamma Distribution Test**						**Data Distribution**	
2724					k star (bias corrected)	2.126					**Data do not follow a Discernable Distribution (0.05)**	
2725					Theta Star	0.00525						
2726					nu star	55.27						
2727					Approximate Chi Square Value (.05)	39.18					**Nonparametric Statistics**	
2728					Adjusted Level of Significance	0.0301					95% CLT UCL	0.0154
2729					Adjusted Chi Square Value	37.26					95% Jackknife UCL	0.0158
2730											95% Standard Bootstrap UCL	0.0153
2731					Anderson-Darling Test Statistic	1.57					95% Bootstrap-t UCL	0.0302
2732					Anderson-Darling 5% Critical Value	0.74					95% Hall's Bootstrap UCL	0.0366
2733					Kolmogorov-Smirnov Test Statistic	0.286					95% Percentile Bootstrap UCL	0.0157
2734					Kolmogorov-Smirnov 5% Critical Value	0.239					95% BCA Bootstrap UCL	0.0178
2735					**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0225
2736											97.5% Chebyshev(Mean, Sd) UCL	0.0274
2737					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.0371
2738					95% Approximate Gamma UCL	0.0157						
2739					95% Adjusted Gamma UCL	0.0166						
2740												
2741					**Potential UCL to Use**						Use 95% Chebyshev (Mean, Sd) UCL	0.0225
2742												
2743												
2744	**Vanadium, dissolved (ow-3d)**											
2745												
2746					**General Statistics**							
2747					Number of Valid Observations	1					Number of Distinct Observations	1
2748												
2749												
2750					**Warning: This data set only has 1 observations!**							
2751					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
2752					**The data set for variable Vanadium, dissolved (ow-3d) was not processed!**							
2753												
2754					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
2755					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
2756												

Vanadium, dissolved (ow-3m)

General Statistics

Number of Valid Observations	3	Number of Distinct Observations	3

Warning: This data set only has 3 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Vanadium, dissolved (ow-3m) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Vanadium, dissolved (ow-3s)

General Statistics

Number of Valid Observations	2	Number of Distinct Observations	2

Warning: This data set only has 2 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Vanadium, dissolved (ow-3s) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Vanadium, dissolved (ow-5d)

General Statistics

Number of Valid Data	14	Number of Detected Data	11
Number of Distinct Detected Data	11	Number of Non-Detect Data	3
		Percent Non-Detects	21.43%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.00166	Minimum Detected	-6.401
Maximum Detected	0.0966	Maximum Detected	-2.337
Mean of Detected	0.0249	Mean of Detected	-4.308
SD of Detected	0.033	SD of Detected	1.133
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.005	Maximum Non-Detect	-5.298
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	4
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	10
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	28.57%

UCL Statistics

Normal Distribution Test with Detected Values Only	**Lognormal Distribution Test with Detected Values Only**

2810					Shapiro Wilk Test Statistic	0.611					Shapiro Wilk Test Statistic	0.876
2811					5% Shapiro Wilk Critical Value	0.85					5% Shapiro Wilk Critical Value	0.85
2812					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
2813												
2814					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2815					DL/2 Substitution Method						DL/2 Substitution Method	
2816					Mean	0.0198					Mean	-4.898
2817					SD	0.0306					SD	1.581
2818					95% DL/2 (t) UCL	0.0343					95% H-Stat (DL/2) UCL	0.055
2819												
2820					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2821					Mean	0.0134					Mean in Log Scale	-4.834
2822					SD	0.0366					SD in Log Scale	1.451
2823					95% MLE (t) UCL	0.0307					Mean in Original Scale	0.0198
2824					95% MLE (Tiku) UCL	0.0312					SD in Original Scale	0.0306
2825											95% Percentile Bootstrap UCL	0.0336
2826											95% BCA Bootstrap UCL	0.038
2827												
2828					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
2829					k star (bias corrected)	0.747					**Data appear Lognormal at 5% Significance Level**	
2830					Theta Star	0.0334						
2831					nu star	16.44						
2832												
2833					A-D Test Statistic	1.2					**Nonparametric Statistics**	
2834					5% A-D Critical Value	0.754					Kaplan-Meier (KM) Method	
2835					K-S Test Statistic	0.754					Mean	0.0199
2836					5% K-S Critical Value	0.263					SD	0.0295
2837					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00826
2838											95% KM (t) UCL	0.0346
2839					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0335
2840					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0339
2841					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0958
2842					Maximum	0.0966					95% KM (BCA) UCL	0.0345
2843					Mean	0.0196					95% KM (Percentile Bootstrap) UCL	0.0348
2844					Median	0.0107					95% KM (Chebyshev) UCL	0.0559
2845					SD	0.0308					97.5% KM (Chebyshev) UCL	0.0715
2846					k star	0.197					99% KM (Chebyshev) UCL	0.102
2847					Theta star	0.0993						
2848					Nu star	5.524					**Potential UCLs to Use**	
2849					AppChi2	1.402					97.5% KM (Chebyshev) UCL	0.0715
2850					95% Gamma Approximate UCL	0.0772						
2851					95% Adjusted Gamma UCL	0.0943						
2852	**Note: DL/2 is not a recommended method.**											
2853												
2854												
2855	**Vanadium, dissolved (ow-5m)**											
2856												
2857						**General Statistics**							
2858					Number of Valid Data	14					Number of Detected Data	12
2859					Number of Distinct Detected Data	11					Number of Non-Detect Data	2
2860											Percent Non-Detects	14.29%
2861												
2862					**Raw Statistics**						**Log-transformed Statistics**	

2863					Minimum Detected	0.00181					Minimum Detected	-6.314
2864					Maximum Detected	0.122					Maximum Detected	-2.104
2865					Mean of Detected	0.0239					Mean of Detected	-4.532
2866					SD of Detected	0.036					SD of Detected	1.304
2867					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
2868					Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298
2869												
2870												
2871	**UCL Statistics**											
2872	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2873					Shapiro Wilk Test Statistic	0.632					Shapiro Wilk Test Statistic	0.936
2874					5% Shapiro Wilk Critical Value	0.859					5% Shapiro Wilk Critical Value	0.859
2875	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2876												
2877	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2878					DL/2 Substitution Method						DL/2 Substitution Method	
2879					Mean	0.0209					Mean	-4.741
2880					SD	0.0341					SD	1.312
2881					95% DL/2 (t) UCL	0.037					95% H-Stat (DL/2) UCL	0.0594
2882												
2883					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
2884					Mean	0.00995					Mean in Log Scale	-4.769
2885					SD	0.044					SD in Log Scale	1.35
2886					95% MLE (t) UCL	0.0308					Mean in Original Scale	0.0208
2887					95% MLE (Tiku) UCL	0.0325					SD in Original Scale	0.0341
2888											95% Percentile Bootstrap UCL	0.0364
2889											95% BCA Bootstrap UCL	0.0429
2890												
2891	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2892					k star (bias corrected)	0.617	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
2893					Theta Star	0.0388						
2894					nu star	14.81						
2895												
2896					A-D Test Statistic	0.695	**Nonparametric Statistics**					
2897					5% A-D Critical Value	0.766					Kaplan-Meier (KM) Method	
2898					K-S Test Statistic	0.766					Mean	0.0208
2899					5% K-S Critical Value	0.255					SD	0.0328
2900	**Data follow Appr. Gamma Distribution at 5% Significance Level**										SE of Mean	0.00917
2901											95% KM (t) UCL	0.0371
2902	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0359
2903					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.037
2904					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0892
2905					Maximum	0.122					95% KM (BCA) UCL	0.0364
2906					Mean	0.0205					95% KM (Percentile Bootstrap) UCL	0.0359
2907					Median	0.0097					95% KM (Chebyshev) UCL	0.0608
2908					SD	0.0343					97.5% KM (Chebyshev) UCL	0.0781
2909					k star	0.294					99% KM (Chebyshev) UCL	0.112
2910					Theta star	0.0699						
2911					Nu star	8.224	**Potential UCLs to Use**					
2912					AppChi2	2.866					95% KM (Chebyshev) UCL	0.0608
2913					95% Gamma Approximate UCL	0.0589						
2914					95% Adjusted Gamma UCL	0.0685						
2915	**Note: DL/2 is not a recommended method.**											

2916												
2917												
2918	**Vanadium, dissolved (ow-5s)**											
2919												
2920						**General Statistics**						
2921					Number of Valid Data	14			Number of Detected Data	13		
2922					Number of Distinct Detected Data	11			Number of Non-Detect Data	1		
2923									Percent Non-Detects	7.14%		
2924												
2925					**Raw Statistics**				**Log-transformed Statistics**			
2926					Minimum Detected	0.0037			Minimum Detected	-5.599		
2927					Maximum Detected	0.0415			Maximum Detected	-3.182		
2928					Mean of Detected	0.011			Mean of Detected	-4.801		
2929					SD of Detected	0.0108			SD of Detected	0.71		
2930					Minimum Non-Detect	0.005			Minimum Non-Detect	-5.298		
2931					Maximum Non-Detect	0.005			Maximum Non-Detect	-5.298		
2932												
2933												
2934						**UCL Statistics**						
2935					**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**			
2936					Shapiro Wilk Test Statistic	0.659			Shapiro Wilk Test Statistic	0.856		
2937					5% Shapiro Wilk Critical Value	0.866			5% Shapiro Wilk Critical Value	0.866		
2938					**Data not Normal at 5% Significance Level**				**Data not Lognormal at 5% Significance Level**			
2939												
2940					**Assuming Normal Distribution**				**Assuming Lognormal Distribution**			
2941					DL/2 Substitution Method				DL/2 Substitution Method			
2942					Mean	0.0104			Mean	-4.886		
2943					SD	0.0107			SD	0.752		
2944					95% DL/2 (t) UCL	0.0154			95% H-Stat (DL/2) UCL	0.0164		
2945												
2946					Maximum Likelihood Estimate(MLE) Method				Log ROS Method			
2947					Mean	0.00889			Mean in Log Scale	-4.873		
2948					SD	0.0119			SD in Log Scale	0.733		
2949					95% MLE (t) UCL	0.0145			Mean in Original Scale	0.0104		
2950					95% MLE (Tiku) UCL	0.0145			SD in Original Scale	0.0106		
2951									95% Percentile Bootstrap UCL	0.0156		
2952									95% BCA Bootstrap UCL	0.0174		
2953												
2954					**Gamma Distribution Test with Detected Values Only**				**Data Distribution Test with Detected Values Only**			
2955					k star (bias corrected)	1.502			**Data do not follow a Discernable Distribution (0.05)**			
2956					Theta Star	0.0073						
2957					nu star	39.05						
2958												
2959					A-D Test Statistic	1.17			**Nonparametric Statistics**			
2960					5% A-D Critical Value	0.745			Kaplan-Meier (KM) Method			
2961					K-S Test Statistic	0.745			Mean	0.0105		
2962					5% K-S Critical Value	0.24			SD	0.0102		
2963					**Data not Gamma Distributed at 5% Significance Level**				SE of Mean	0.00283		
2964									95% KM (t) UCL	0.0155		
2965					**Assuming Gamma Distribution**				95% KM (z) UCL	0.0151		
2966					Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL	0.0155		
2967					Minimum	9.783E-05			95% KM (bootstrap t) UCL	0.0268		
2968					Maximum	0.0415			95% KM (BCA) UCL	0.0153		

2969					Mean	0.0102				95% KM (Percentile Bootstrap) UCL		0.0152
2970					Median	0.0057				95% KM (Chebyshev) UCL		0.0228
2971					SD	0.0108				97.5% KM (Chebyshev) UCL		0.0282
2972					k star	0.894				99% KM (Chebyshev) UCL		0.0387
2973					Theta star	0.0114						
2974					Nu star	25.04				**Potential UCLs to Use**		
2975					AppChi2	14.64				95% KM (Chebyshev) UCL		0.0228
2976					95% Gamma Approximate UCL	0.0174						
2977					95% Adjusted Gamma UCL	0.0188						
2978	**Note: DL/2 is not a recommended method.**											
2979												
2980												
2981	**Vanadium, dissolved (park moabi-4)**											
2982												
2983	**General Statistics**											
2984					Number of Valid Observations	1				Number of Distinct Observations		1
2985												
2986												
2987	**Warning: This data set only has 1 observations!**											
2988	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2989	**The data set for variable Vanadium, dissolved (park moabi-4) was not processed!**											
2990												
2991	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2992	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2993												
2994												
2995												
2996	**Vanadium, dissolved (pge-6)**											
2997												
2998	**General Statistics**											
2999					Number of Valid Data	3				Number of Detected Data		1
3000					Number of Distinct Detected Data	1				Number of Non-Detect Data		2
3001										Percent Non-Detects		66.67%
3002												
3003	**Warning: This data set only has 3 observations!**											
3004	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3005	**The data set for variable Vanadium, dissolved (pge-6) was not processed!**											
3006												
3007	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3008	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3009												
3010												
3011												
3012	**Vanadium, dissolved (pge-7)**											
3013												
3014	**General Statistics**											
3015					Number of Valid Data	2				Number of Detected Data		1
3016					Number of Distinct Detected Data	1				Number of Non-Detect Data		1
3017										Percent Non-Detects		50.00%
3018												
3019	**Warning: This data set only has 2 observations!**											
3020	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3021	**The data set for variable Vanadium, dissolved (pge-7) was not processed!**											

	A	B	C	D	E	F	G	H	I	J	K	L
3022												
3023	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3024	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3025												
3026												
3027												
3028	Vanadium, dissolved (pge-8)											
3029												
3030	General Statistics											
3031					Number of Valid Data	3			Number of Detected Data	0		
3032					Number of Distinct Detected Data	0			Number of Non-Detect Data	3		
3033									Percent Non-Detects	100.00%		
3034												
3035	Warning: This data set only has 3 observations!											
3036	Data set is too small to compute reliable and meaningful statistics and estimates!											
3037	The data set for variable Vanadium, dissolved (pge-8) was not processed!											
3038												
3039	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3040	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3041												
3042												
3043												
3044	Vanadium, dissolved (tw-1)											
3045												
3046	General Statistics											
3047					Number of Valid Data	4			Number of Detected Data	3		
3048					Number of Distinct Detected Data	3			Number of Non-Detect Data	1		
3049									Percent Non-Detects	25.00%		
3050												
3051	Warning: This data set only has 4 observations!											
3052	Data set is too small to compute reliable and meaningful statistics and estimates!											
3053	The data set for variable Vanadium, dissolved (tw-1) was not processed!											
3054												
3055	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3056	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3057												
3058												
3059												
3060	Vanadium, dissolved (tw-2d)											
3061												
3062	General Statistics											
3063					Number of Valid Data	3			Number of Detected Data	2		
3064					Number of Distinct Detected Data	2			Number of Non-Detect Data	1		
3065									Percent Non-Detects	33.33%		
3066												
3067	Warning: This data set only has 3 observations!											
3068	Data set is too small to compute reliable and meaningful statistics and estimates!											
3069	The data set for variable Vanadium, dissolved (tw-2d) was not processed!											
3070												
3071	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3072	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3073												
3074												

	A	B	C	D	E	F	G	H	I	J	K	L
3075												
3076	**Vanadium, dissolved (tw-2s)**											
3077												
3078	**General Statistics**											
3079						Number of Valid Data	3			Number of Detected Data		1
3080						Number of Distinct Detected Data	1			Number of Non-Detect Data		2
3081										Percent Non-Detects		66.67%
3082												
3083	**Warning: This data set only has 3 observations!**											
3084	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3085	**The data set for variable Vanadium, dissolved (tw-2s) was not processed!**											
3086												
3087	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3088	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3089												
3090												

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Zinc, dissolved (1)											
10												
11	General Statistics											
12	Number of Valid Data			143		Number of Detected Data					94	
13	Number of Distinct Detected Data			87		Number of Non-Detect Data					49	
14						Percent Non-Detects					34.27%	
15												
16	Raw Statistics					Log-transformed Statistics						
17	Minimum Detected			0.0106		Minimum Detected					-4.547	
18	Maximum Detected			0.137		Maximum Detected					-1.988	
19	Mean of Detected			0.0388		Mean of Detected					-3.476	
20	SD of Detected			0.0283		SD of Detected					0.666	
21	Minimum Non-Detect			0.01		Minimum Non-Detect					-4.605	
22	Maximum Non-Detect			0.0162		Maximum Non-Detect					-4.123	
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect					66	
25	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected					77	
26	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage					46.15%	
27												
28	UCL Statistics											
29	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
30	Lilliefors Test Statistic			0.177		Lilliefors Test Statistic					0.0876	
31	5% Lilliefors Critical Value			0.0914		5% Lilliefors Critical Value					0.0914	
32	Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level						
33												
34	Assuming Normal Distribution					Assuming Lognormal Distribution						
35	DL/2 Substitution Method					DL/2 Substitution Method						
36	Mean			0.0273		Mean					-4.095	
37	SD			0.028		SD					1.017	
38	95% DL/2 (t) UCL			0.0311		95% H-Stat (DL/2) UCL					0.0268	
39												
40	Maximum Likelihood Estimate(MLE) Method					Log ROS Method						
41	Mean			0.017		Mean in Log Scale					-4.026	
42	SD			0.0396		SD in Log Scale					0.978	
43	95% MLE (t) UCL			0.0225		Mean in Original Scale					0.0279	
44	95% MLE (Tiku) UCL			0.0235		SD in Original Scale					0.0275	
45						95% Percentile Bootstrap UCL					0.0317	
46						95% BCA Bootstrap UCL					0.0323	
47												
48	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
49	k star (bias corrected)			2.286		Data appear Lognormal at 5% Significance Level						
50	Theta Star			0.017								
51	nu star			429.9								
52												
53	A-D Test Statistic			1.668		Nonparametric Statistics						

54				5% A-D Critical Value	0.763					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.763					Mean		0.0292
56				5% K-S Critical Value	0.0933					SD		0.0265
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.00222
58										95% KM (t) UCL		0.0328
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.0328
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0327
61				Minimum	1E-09					95% KM (bootstrap t) UCL		0.0331
62				Maximum	0.137					95% KM (BCA) UCL		0.0333
63				Mean	0.0331					95% KM (Percentile Bootstrap) UCL		0.0328
64				Median	0.0265					95% KM (Chebyshev) UCL		0.0389
65				SD	0.0256					97.5% KM (Chebyshev) UCL		0.0431
66				k star	0.598					99% KM (Chebyshev) UCL		0.0513
67				Theta star	0.0553							
68				Nu star	171					**Potential UCLs to Use**		
69				AppChi2	141.7					95% KM (BCA) UCL		0.0333
70				95% Gamma Approximate UCL	0.0399							
71				95% Adjusted Gamma UCL	0.04							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Zinc, dissolved (cw-1d)**											
76												
77					**General Statistics**							
78				Number of Valid Data	8					Number of Detected Data		4
79				Number of Distinct Detected Data	4					Number of Non-Detect Data		4
80										Percent Non-Detects		50.00%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.0185					Minimum Detected		-3.99
84				Maximum Detected	0.113					Maximum Detected		-2.18
85				Mean of Detected	0.0679					Mean of Detected		-2.976
86				SD of Detected	0.0511					SD of Detected		0.928
87				Minimum Non-Detect	0.01					Minimum Non-Detect		-4.605
88				Maximum Non-Detect	0.02					Maximum Non-Detect		-3.912
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		5
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		3
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		62.50%
93												
94	**Warning: There are only 4 Distinct Detected Values in this data**											
95	**Note: It should be noted that even though bootstrap may be performed on this data set**											
96	**the resulting calculations may not be reliable enough tp draw conclusions**											
97												
98	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
99												
100												
101	**UCL Statistics**											
102	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
103				Shapiro Wilk Test Statistic	0.79					Shapiro Wilk Test Statistic		0.835
104				5% Shapiro Wilk Critical Value	0.748					5% Shapiro Wilk Critical Value		0.748
105	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
106												

	A	B	C	D	E	F	G	H	I	J	K	L
107	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
108					DL/2 Substitution Method						DL/2 Substitution Method	
109					Mean	0.0383					Mean	-3.877
110					SD	0.0461					SD	1.161
111					95% DL/2 (t) UCL	0.0692					95% H-Stat (DL/2) UCL	0.194
112												
113					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
114	**MLE yields a negative mean**										Mean in Log Scale	-3.931
115											SD in Log Scale	1.262
116											Mean in Original Scale	0.0384
117											SD in Original Scale	0.0462
118											95% Percentile Bootstrap UCL	0.0635
119											95% BCA Bootstrap UCL	0.0722
120												
121	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
122					k star (bias corrected)	0.64	**Data appear Normal at 5% Significance Level**					
123					Theta Star	0.106						
124					nu star	5.121						
125												
126					A-D Test Statistic	0.534	**Nonparametric Statistics**					
127					5% A-D Critical Value	0.661					Kaplan-Meier (KM) Method	
128					K-S Test Statistic	0.661					Mean	0.0432
129					5% K-S Critical Value	0.398					SD	0.0399
130	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0163
131											95% KM (t) UCL	0.074
132	**Assuming Gamma Distribution**										95% KM (z) UCL	0.07
133					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0703
134					Minimum	0.0185					95% KM (bootstrap t) UCL	0.0603
135					Maximum	0.113					95% KM (BCA) UCL	0.112
136					Mean	0.0679					95% KM (Percentile Bootstrap) UCL	0.112
137					Median	0.0721					95% KM (Chebyshev) UCL	0.114
138					SD	0.0347					97.5% KM (Chebyshev) UCL	0.145
139					k star	2.24					99% KM (Chebyshev) UCL	0.205
140					Theta star	0.0303						
141					Nu star	35.83	**Potential UCLs to Use**					
142					AppChi2	23.13					95% KM (t) UCL	0.074
143					95% Gamma Approximate UCL	0.105					95% KM (Percentile Bootstrap) UCL	0.112
144					95% Adjusted Gamma UCL	N/A						
145	**Note: DL/2 is not a recommended method.**											
146												
147												
148	**Zinc, dissolved (cw-1m)**											
149												
150	**General Statistics**											
151					Number of Valid Data	8					Number of Detected Data	3
152					Number of Distinct Detected Data	3					Number of Non-Detect Data	5
153											Percent Non-Detects	62.50%
154												
155	**Raw Statistics**						**Log-transformed Statistics**					
156					Minimum Detected	0.019					Minimum Detected	-3.963
157					Maximum Detected	0.248					Maximum Detected	-1.394
158					Mean of Detected	0.116					Mean of Detected	-2.627
159					SD of Detected	0.119					SD of Detected	1.288

160				Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605	
161				Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912	
162												
163	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	6	
164	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	2	
165	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	75.00%	
166												
167	**Warning: There are only 3 Distinct Detected Values in this data set**											
168	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
169	**Those methods will return a 'N/A' value on your output display!**											
170												
171	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
172	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
173												
174												
175	**UCL Statistics**											
176	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
177				Shapiro Wilk Test Statistic	0.933					Shapiro Wilk Test Statistic	0.995	
178				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
179	**Data appear Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
180												
181	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
182				DL/2 Substitution Method						DL/2 Substitution Method		
183				Mean	0.0484					Mean	-4.037	
184				SD	0.0844					SD	1.385	
185				95% DL/2 (t) UCL	0.105					95% H-Stat (DL/2) UCL	0.245	
186												
187				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
188	**MLE method failed to converge properly**									Mean in Log Scale	-4.693	
189										SD in Log Scale	2.022	
190										Mean in Original Scale	0.0461	
191										SD in Original Scale	0.0858	
192										95% Percentile Bootstrap UCL	0.0995	
193										95% BCA Bootstrap UCL	0.124	
194												
195	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
196				k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**		
197				Theta Star	N/A							
198				nu star	N/A							
199												
200				A-D Test Statistic	0.246					**Nonparametric Statistics**		
201				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
202				K-S Test Statistic	N/A					Mean	0.0553	
203				5% K-S Critical Value	N/A					SD	0.0755	
204	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0327	
205										95% KM (t) UCL	0.117	
206	**Assuming Gamma Distribution**									95% KM (z) UCL	0.109	
207				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.115	
208				Minimum	N/A					95% KM (bootstrap t) UCL	0.119	
209				Maximum	N/A					95% KM (BCA) UCL	N/A	
210				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
211				Median	N/A					95% KM (Chebyshev) UCL	0.198	
212				SD	N/A					97.5% KM (Chebyshev) UCL	0.26	

213					k star	N/A					99% KM (Chebyshev) UCL	0.381
214					Theta star	N/A						
215					Nu star	N/A	**Potential UCLs to Use**					
216					AppChi2	N/A					95% KM (t) UCL	0.117
217				95% Gamma Approximate UCL		N/A					95% KM (Percentile Bootstrap) UCL	N/A
218				95% Adjusted Gamma UCL		N/A						
219	**Note: DL/2 is not a recommended method.**											
220												
221												
222	**Zinc, dissolved (cw-2d)**											
223												
224	**General Statistics**											
225					Number of Valid Data	8					Number of Detected Data	2
226					Number of Distinct Detected Data	2					Number of Non-Detect Data	6
227											Percent Non-Detects	75.00%
228												
229	**Raw Statistics**						**Log-transformed Statistics**					
230					Minimum Detected	0.0262					Minimum Detected	-3.642
231					Maximum Detected	0.0522					Maximum Detected	-2.953
232					Mean of Detected	0.0392					Mean of Detected	-3.297
233					SD of Detected	0.0184					SD of Detected	0.487
234					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
235					Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912
236												
237	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	6
238	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
239	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	75.00%
240												
241	**Warning: Data set has only 2 Distinct Detected Values.**											
242	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
243	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
244												
245	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
246												
247	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
248	**Those methods will return a 'N/A' value on your output display!**											
249												
250	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
251	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
252												
253												
254	**UCL Statistics**											
255	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
256					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
257					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
258	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
259												
260	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
261					DL/2 Substitution Method						DL/2 Substitution Method	
262					Mean	0.0161					Mean	-4.451
263					SD	0.016					SD	0.796
264					95% DL/2 (t) UCL	0.0268					95% H-Stat (DL/2) UCL	0.0284
265												

266	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
267	**MLE method failed to converge properly**						Mean in Log Scale					N/A
268							SD in Log Scale					N/A
269							Mean in Original Scale					N/A
270							SD in Original Scale					N/A
271							95% Percentile Bootstrap UCL					N/A
272							95% BCA Bootstrap UCL					N/A
273												
274	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
275	k star (bias corrected)					N/A	**Data do not follow a Discernable Distribution (0.05)**					
276	Theta Star					N/A						
277	nu star					N/A						
278												
279	A-D Test Statistic					0.359	**Nonparametric Statistics**					
280	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
281	K-S Test Statistic					N/A	Mean					0.0295
282	5% K-S Critical Value					N/A	SD					0.0086
283	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0043
284							95% KM (t) UCL					0.0376
285	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0365
286	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0483
287	Minimum					N/A	95% KM (bootstrap t) UCL					1.8E+308
288	Maximum					N/A	95% KM (BCA) UCL					0.0522
289	Mean					N/A	95% KM (Percentile Bootstrap) UCL					0.0522
290	Median					N/A	95% KM (Chebyshev) UCL					0.0482
291	SD					N/A	97.5% KM (Chebyshev) UCL					0.0563
292	k star					N/A	99% KM (Chebyshev) UCL					0.0722
293	Theta star					N/A						
294	Nu star					N/A	**Potential UCLs to Use**					
295	AppChi2					N/A	95% KM (t) UCL					0.0376
296	95% Gamma Approximate UCL					N/A	95% KM (% Bootstrap) UCL					0.0522
297	95% Adjusted Gamma UCL					N/A						
298	**Note: DL/2 is not a recommended method.**											
299												
300												
301	**Zinc, dissolved (cw-2m)**											
302												
303	**General Statistics**											
304	Number of Valid Data					8	Number of Detected Data					3
305	Number of Distinct Detected Data					3	Number of Non-Detect Data					5
306							Percent Non-Detects					62.50%
307												
308	**Raw Statistics**						**Log-transformed Statistics**					
309	Minimum Detected					0.0272	Minimum Detected					-3.605
310	Maximum Detected					0.215	Maximum Detected					-1.537
311	Mean of Detected					0.0918	Mean of Detected					-2.849
312	SD of Detected					0.107	SD of Detected					1.14
313	Minimum Non-Detect					0.01	Minimum Non-Detect					-4.605
314	Maximum Non-Detect					0.02	Maximum Non-Detect					-3.912
315												
316	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					5
317	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					3
318	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					62.50%

319												
320	**Warning: There are only 3 Distinct Detected Values in this data set**											
321	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
322	**Those methods will return a 'N/A' value on your output display!**											
323												
324	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
325	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
326												
327												
328	**UCL Statistics**											
329	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
330				Shapiro Wilk Test Statistic	0.774					Shapiro Wilk Test Statistic	0.822	
331				5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767	
332	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
333												
334	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
335				DL/2 Substitution Method						DL/2 Substitution Method		
336				Mean	0.0388					Mean	-4.207	
337				SD	0.072					SD	1.311	
338				95% DL/2 (t) UCL	0.087					95% H-Stat (DL/2) UCL	0.141	
339												
340				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
341	**MLE yields a negative mean**									Mean in Log Scale	-5.47	
342										SD in Log Scale	2.413	
343										Mean in Original Scale	0.0353	
344										SD in Original Scale	0.0738	
345										95% Percentile Bootstrap UCL	0.0847	
346										95% BCA Bootstrap UCL	0.108	
347												
348	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
349				k star (bias corrected)	N/A		**Data appear Normal at 5% Significance Level**					
350				Theta Star	N/A							
351				nu star	N/A							
352												
353				A-D Test Statistic	0.533		**Nonparametric Statistics**					
354				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
355				K-S Test Statistic	N/A					Mean	0.0514	
356				5% K-S Critical Value	N/A					SD	0.0619	
357	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0268	
358										95% KM (t) UCL	0.102	
359	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0955	
360				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0936	
361				Minimum	N/A					95% KM (bootstrap t) UCL	0.828	
362				Maximum	N/A					95% KM (BCA) UCL	0.215	
363				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
364				Median	N/A					95% KM (Chebyshev) UCL	0.168	
365				SD	N/A					97.5% KM (Chebyshev) UCL	0.219	
366				k star	N/A					99% KM (Chebyshev) UCL	0.318	
367				Theta star	N/A							
368				Nu star	N/A					**Potential UCLs to Use**		
369				AppChi2	N/A					95% KM (t) UCL	0.102	
370				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
371				95% Adjusted Gamma UCL	N/A							

	A	B	C	D	E	F	G	H	I	J	K	L
372	**Note: DL/2 is not a recommended method.**											
373												
374												
375	**Zinc, dissolved (cw-3d)**											
376												
377	**General Statistics**											
378						Number of Valid Data	8				Number of Detected Data	1
379						Number of Distinct Detected Data	1				Number of Non-Detect Data	7
380											Percent Non-Detects	87.50%
381												
382	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
383	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
384												
385	**The data set for variable Zinc, dissolved (cw-3d) was not processed!**											
386												
387												
388												
389	**Zinc, dissolved (cw-3m)**											
390												
391	**General Statistics**											
392						Number of Valid Data	8				Number of Detected Data	3
393						Number of Distinct Detected Data	3				Number of Non-Detect Data	5
394											Percent Non-Detects	62.50%
395												
396	**Raw Statistics**							**Log-transformed Statistics**				
397						Minimum Detected	0.0267				Minimum Detected	-3.623
398						Maximum Detected	0.0617				Maximum Detected	-2.785
399						Mean of Detected	0.0436				Mean of Detected	-3.19
400						SD of Detected	0.0175				SD of Detected	0.42
401						Minimum Non-Detect	0.01				Minimum Non-Detect	-4.605
402						Maximum Non-Detect	0.02				Maximum Non-Detect	-3.912
403												
404	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	5
405	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	3
406	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	62.50%
407												
408	**Warning: There are only 3 Distinct Detected Values in this data set**											
409	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
410	**Those methods will return a 'N/A' value on your output display!**											
411												
412	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
413	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
414												
415												
416	**UCL Statistics**											
417	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
418						Shapiro Wilk Test Statistic	0.996				Shapiro Wilk Test Statistic	0.996
419						5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value	0.767
420	**Data appear Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
421												
422	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
423						DL/2 Substitution Method					DL/2 Substitution Method	
424						Mean	0.0214				Mean	-4.248

425				SD	0.0208					SD	0.949	
426				95% DL/2 (t) UCL	0.0353					95% H-Stat (DL/2) UCL	0.0525	
427												
428				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
429				Mean	0.0111					Mean in Log Scale	-4.2	
430				SD	0.0312					SD in Log Scale	0.928	
431				95% MLE (t) UCL	0.032					Mean in Original Scale	0.0219	
432				95% MLE (Tiku) UCL	0.0417					SD in Original Scale	0.0205	
433										95% Percentile Bootstrap UCL	0.0337	
434										95% BCA Bootstrap UCL	0.0354	
435												
436	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
437				k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**		
438				Theta Star	N/A							
439				nu star	N/A							
440												
441				A-D Test Statistic	0.246					**Nonparametric Statistics**		
442				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
443				K-S Test Statistic	N/A					Mean	0.033	
444				5% K-S Critical Value	N/A					SD	0.012	
445	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00519	
446										95% KM (t) UCL	0.0429	
447	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0416	
448				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0452	
449				Minimum	N/A					95% KM (bootstrap t) UCL	0.0377	
450				Maximum	N/A					95% KM (BCA) UCL	0.0617	
451				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0617	
452				Median	N/A					95% KM (Chebyshev) UCL	0.0557	
453				SD	N/A					97.5% KM (Chebyshev) UCL	0.0655	
454				k star	N/A					99% KM (Chebyshev) UCL	0.0847	
455				Theta star	N/A							
456				Nu star	N/A					**Potential UCLs to Use**		
457				AppChi2	N/A					95% KM (t) UCL	0.0429	
458				95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0617	
459				95% Adjusted Gamma UCL	N/A							
460	**Note: DL/2 is not a recommended method.**											
461												
462												
463	**Zinc, dissolved (cw-4d)**											
464												
465					**General Statistics**							
466				Number of Valid Data	8					Number of Detected Data	2	
467				Number of Distinct Detected Data	2					Number of Non-Detect Data	6	
468										Percent Non-Detects	75.00%	
469												
470	**Raw Statistics**									**Log-transformed Statistics**		
471				Minimum Detected	0.0257					Minimum Detected	-3.661	
472				Maximum Detected	0.0323					Maximum Detected	-3.433	
473				Mean of Detected	0.029					Mean of Detected	-3.547	
474				SD of Detected	0.00467					SD of Detected	0.162	
475				Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605	
476				Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912	
477												

478	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	6
479	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
480	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	75.00%
481												
482	**Warning: Data set has only 2 Distinct Detected Values.**											
483	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
484	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
485												
486	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
487												
488	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
489	**Those methods will return a 'N/A' value on your output display!**											
490												
491	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
492	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
493												
494												
495	**UCL Statistics**											
496	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
497	Shapiro Wilk Test Statistic				1		Shapiro Wilk Test Statistic					1
498	5% Shapiro Wilk Critical Value				N/A		5% Shapiro Wilk Critical Value					N/A
499	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
500												
501	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
502	DL/2 Substitution Method						DL/2 Substitution Method					
503	Mean				0.0135		Mean					-4.514
504	SD				0.00997		SD					0.672
505	95% DL/2 (t) UCL				0.0202		95% H-Stat (DL/2) UCL					0.0199
506												
507	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
508	**MLE method failed to converge properly**						Mean in Log Scale					N/A
509							SD in Log Scale					N/A
510							Mean in Original Scale					N/A
511							SD in Original Scale					N/A
512							95% Percentile Bootstrap UCL					N/A
513							95% BCA Bootstrap UCL					N/A
514												
515	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
516	k star (bias corrected)				N/A		**Data do not follow a Discernable Distribution (0.05)**					
517	Theta Star				N/A							
518	nu star				N/A							
519												
520	A-D Test Statistic				0.359		**Nonparametric Statistics**					
521	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
522	K-S Test Statistic				N/A		Mean					0.0265
523	5% K-S Critical Value				N/A		SD					0.00218
524	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.00109
525							95% KM (t) UCL					0.0286
526	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0283
527	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0313
528	Minimum				N/A		95% KM (bootstrap t) UCL					1.8E+308
529	Maximum				N/A		95% KM (BCA) UCL					N/A
530	Mean				N/A		95% KM (Percentile Bootstrap) UCL					0.0323

531				Median	N/A				95% KM (Chebyshev) UCL			0.0313
532				SD	N/A				97.5% KM (Chebyshev) UCL			0.0333
533				k star	N/A				99% KM (Chebyshev) UCL			0.0374
534				Theta star	N/A							
535				Nu star	N/A				**Potential UCLs to Use**			
536				AppChi2	N/A				95% KM (t) UCL			0.0286
537				95% Gamma Approximate UCL	N/A				95% KM (% Bootstrap) UCL			0.0323
538				95% Adjusted Gamma UCL	N/A							
539	**Note: DL/2 is not a recommended method.**											
540												
541												
542	**Zinc, dissolved (cw-4m)**											
543												
544					**General Statistics**							
545				Number of Valid Data	8				Number of Detected Data			2
546				Number of Distinct Detected Data	2				Number of Non-Detect Data			6
547									Percent Non-Detects			75.00%
548												
549				**Raw Statistics**					**Log-transformed Statistics**			
550				Minimum Detected	0.0315				Minimum Detected			-3.458
551				Maximum Detected	0.0316				Maximum Detected			-3.455
552				Mean of Detected	0.0316				Mean of Detected			-3.456
553				SD of Detected	7.071E-05				SD of Detected			0.00224
554				Minimum Non-Detect	0.01				Minimum Non-Detect			-4.605
555				Maximum Non-Detect	0.02				Maximum Non-Detect			-3.912
556												
557	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			6
558	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			2
559	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			75.00%
560												
561	**Warning: Data set has only 2 Distinct Detected Values.**											
562	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
563	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
564												
565	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
566												
567	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
568	**Those methods will return a 'N/A' value on your output display!**											
569												
570	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
571	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
572												
573												
574					**UCL Statistics**							
575				**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**			
576				Shapiro Wilk Test Statistic	1				Shapiro Wilk Test Statistic			1
577				5% Shapiro Wilk Critical Value	N/A				5% Shapiro Wilk Critical Value			N/A
578				**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**			
579												
580				**Assuming Normal Distribution**					**Assuming Lognormal Distribution**			
581				DL/2 Substitution Method					DL/2 Substitution Method			
582				Mean	0.0141				Mean			-4.491
583				SD	0.011				SD			0.707

584				95% DL/2 (t) UCL	0.0215					95% H-Stat (DL/2) UCL	0.0259	
585												
586				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
587				**MLE method failed to converge properly**						Mean in Log Scale	N/A	
588										SD in Log Scale	N/A	
589										Mean in Original Scale	N/A	
590										SD in Original Scale	N/A	
591										95% Percentile Bootstrap UCL	N/A	
592										95% BCA Bootstrap UCL	N/A	
593												
594				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
595				k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**		
596				Theta Star	N/A							
597				nu star	N/A							
598												
599				A-D Test Statistic	0.901					**Nonparametric Statistics**		
600				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
601				K-S Test Statistic	N/A					Mean	0.0315	
602				5% K-S Critical Value	N/A					SD	3.307E-05	
603				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	1.654E-05	
604										95% KM (t) UCL	0.0315	
605				**Assuming Gamma Distribution**						95% KM (z) UCL	0.0315	
606				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0316	
607				Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308	
608				Maximum	N/A					95% KM (BCA) UCL	0.0316	
609				Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A	
610				Median	N/A					95% KM (Chebyshev) UCL	0.0316	
611				SD	N/A					97.5% KM (Chebyshev) UCL	0.0316	
612				k star	N/A					99% KM (Chebyshev) UCL	0.0317	
613				Theta star	N/A							
614				Nu star	N/A					**Potential UCLs to Use**		
615				AppChi2	N/A					95% KM (t) UCL	0.0315	
616				95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A	
617				95% Adjusted Gamma UCL	N/A							
618	**Note: DL/2 is not a recommended method.**											
619												
620												
621	**Zinc, dissolved (mw-1)**											
622												
623						**General Statistics**							
624				Number of Valid Data	5					Number of Detected Data	4	
625				Number of Distinct Detected Data	4					Number of Non-Detect Data	1	
626										Percent Non-Detects	20.00%	
627												
628				**Raw Statistics**						**Log-transformed Statistics**		
629				Minimum Detected	0.0033					Minimum Detected	-5.714	
630				Maximum Detected	0.0728					Maximum Detected	-2.62	
631				Mean of Detected	0.0216					Mean of Detected	-4.739	
632				SD of Detected	0.0342					SD of Detected	1.436	
633				Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605	
634				Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605	
635												
636												

	A	B	C	D	E	F	G	H	I	J	K	L
637	**Warning: There are only 4 Distinct Detected Values in this data**											
638	**Note: It should be noted that even though bootstrap may be performed on this data set**											
639	**the resulting calculations may not be reliable enough tp draw conclusions**											
640												
641	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
642												
643												
644	**UCL Statistics**											
645	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
646	Shapiro Wilk Test Statistic					0.66	Shapiro Wilk Test Statistic					0.781
647	5% Shapiro Wilk Critical Value					0.748	5% Shapiro Wilk Critical Value					0.748
648	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
649												
650	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
651	DL/2 Substitution Method						DL/2 Substitution Method					
652	Mean					0.0182	Mean					-4.851
653	SD					0.0305	SD					1.268
654	95% DL/2 (t) UCL					0.0473	95% H-Stat (DL/2) UCL					0.827
655												
656	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
657	**MLE method failed to converge properly**						Mean in Log Scale					-4.848
658							SD in Log Scale					1.267
659							Mean in Original Scale					0.0183
660							SD in Original Scale					0.0305
661							95% Percentile Bootstrap UCL					0.0451
662							95% BCA Bootstrap UCL					0.0459
663												
664	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
665	k star (bias corrected)					0.335	**Data appear Lognormal at 5% Significance Level**					
666	Theta Star					0.0643						
667	nu star					2.681						
668												
669	A-D Test Statistic					0.713	**Nonparametric Statistics**					
670	5% A-D Critical Value					0.674	Kaplan-Meier (KM) Method					
671	K-S Test Statistic					0.674	Mean					0.0181
672	5% K-S Critical Value					0.407	SD					0.0274
673	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0141
674							95% KM (t) UCL					0.0483
675	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0414
676	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0473
677	Minimum					0.0033	95% KM (bootstrap t) UCL					1.031
678	Maximum					0.0728	95% KM (BCA) UCL					0.0456
679	Mean					0.0218	95% KM (Percentile Bootstrap) UCL					0.0453
680	Median					0.0061	95% KM (Chebyshev) UCL					0.0797
681	SD					0.0296	97.5% KM (Chebyshev) UCL					0.106
682	k star					0.461	99% KM (Chebyshev) UCL					0.159
683	Theta star					0.0473						
684	Nu star					4.614	**Potential UCLs to Use**					
685	AppChi2					0.978	97.5% KM (Chebyshev) UCL					0.106
686	95% Gamma Approximate UCL					0.103						
687	95% Adjusted Gamma UCL					N/A						
688	**Warning: Recommended UCL exceeds the maximum observation**											
689	**Note: DL/2 is not a recommended method.**											

	A	B	C	D	E	F	G	H	I	J	K	L
690												
691												
692	**Zinc, dissolved (mw-10)**											
693												
694	**General Statistics**											
695	Number of Valid Data					39	Number of Detected Data					28
696	Number of Distinct Detected Data					27	Number of Non-Detect Data					11
697							Percent Non-Detects					28.21%
698												
699	**Raw Statistics**						**Log-transformed Statistics**					
700	Minimum Detected					0.0053	Minimum Detected					-5.24
701	Maximum Detected					0.637	Maximum Detected					-0.451
702	Mean of Detected					0.0782	Mean of Detected					-3.48
703	SD of Detected					0.142	SD of Detected					1.297
704	Minimum Non-Detect					0.005	Minimum Non-Detect					-5.298
705	Maximum Non-Detect					0.0289	Maximum Non-Detect					-3.544
706												
707	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					27
708	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					12
709	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					69.23%
710												
711	**UCL Statistics**											
712	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
713	Shapiro Wilk Test Statistic					0.541	Shapiro Wilk Test Statistic					0.935
714	5% Shapiro Wilk Critical Value					0.924	5% Shapiro Wilk Critical Value					0.924
715	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
716												
717	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
718	DL/2 Substitution Method						DL/2 Substitution Method					
719	Mean					0.058	Mean					-3.948
720	SD					0.124	SD					1.352
721	95% DL/2 (t) UCL					0.0915	95% H-Stat (DL/2) UCL					0.0468
722												
723	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
724	**MLE yields a negative mean**						Mean in Log Scale					-4.025
725							SD in Log Scale					1.466
726							Mean in Original Scale					0.0578
727							SD in Original Scale					0.124
728							95% Percentile Bootstrap UCL					0.0931
729							95% BCA Bootstrap UCL					0.107
730												
731	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
732	k star (bias corrected)					0.608	**Data appear Lognormal at 5% Significance Level**					
733	Theta Star					0.129						
734	nu star					34.06						
735												
736	A-D Test Statistic					1.589	**Nonparametric Statistics**					
737	5% A-D Critical Value					0.794	Kaplan-Meier (KM) Method					
738	K-S Test Statistic					0.794	Mean					0.0583
739	5% K-S Critical Value					0.173	SD					0.122
740	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0199
741							95% KM (t) UCL					0.0919
742	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0911

743	Gamma ROS Statistics using Extrapolated Data									95% KM (jackknife) UCL		0.0917
744					Minimum	1E-09				95% KM (bootstrap t) UCL		0.14
745					Maximum	0.637				95% KM (BCA) UCL		0.0952
746					Mean	0.0639				95% KM (Percentile Bootstrap) UCL		0.0937
747					Median	0.0227				95% KM (Chebyshev) UCL		0.145
748					SD	0.123				97.5% KM (Chebyshev) UCL		0.183
749					k star	0.315				99% KM (Chebyshev) UCL		0.256
750					Theta star	0.203						
751					Nu star	24.56				**Potential UCLs to Use**		
752					AppChi2	14.28				97.5% KM (Chebyshev) UCL		0.183
753					95% Gamma Approximate UCL	0.11						
754					95% Adjusted Gamma UCL	0.112						
755	**Note: DL/2 is not a recommended method.**											
756												
757												
758	**Zinc, dissolved (mw-11)**											
759												
760	**General Statistics**											
761					Number of Valid Data	35				Number of Detected Data		26
762					Number of Distinct Detected Data	22				Number of Non-Detect Data		9
763										Percent Non-Detects		25.71%
764												
765	**Raw Statistics**									**Log-transformed Statistics**		
766					Minimum Detected	0.0053				Minimum Detected		-5.24
767					Maximum Detected	0.45				Maximum Detected		-0.799
768					Mean of Detected	0.0743				Mean of Detected		-3.574
769					SD of Detected	0.129				SD of Detected		1.303
770					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
771					Maximum Non-Detect	0.0214				Maximum Non-Detect		-3.844
772												
773	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		22
774	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		13
775	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		62.86%
776												
777	**UCL Statistics**											
778	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
779					Shapiro Wilk Test Statistic	0.557				Shapiro Wilk Test Statistic		0.904
780					5% Shapiro Wilk Critical Value	0.92				5% Shapiro Wilk Critical Value		0.92
781	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**		
782												
783	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
784					DL/2 Substitution Method					DL/2 Substitution Method		
785					Mean	0.057				Mean		-3.955
786					SD	0.115				SD		1.319
787					95% DL/2 (t) UCL	0.0897				95% H-Stat (DL/2) UCL		0.0575
788												
789					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
790	**MLE yields a negative mean**									Mean in Log Scale		-4.03
791										SD in Log Scale		1.423
792										Mean in Original Scale		0.0568
793										SD in Original Scale		0.115
794										95% Percentile Bootstrap UCL		0.0924
795										95% BCA Bootstrap UCL		0.0987

796												
797	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
798					k star (bias corrected)	0.583	**Data do not follow a Discernable Distribution (0.05)**					
799					Theta Star	0.127						
800					nu star	30.31						
801												
802					A-D Test Statistic	2.09	**Nonparametric Statistics**					
803					5% A-D Critical Value	0.796	Kaplan-Meier (KM) Method					
804					K-S Test Statistic	0.796	Mean	0.0572				
805					5% K-S Critical Value	0.18	SD	0.113				
806	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0194				
807							95% KM (t) UCL	0.0901				
808	**Assuming Gamma Distribution**						95% KM (z) UCL	0.0892				
809	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0899				
810					Minimum	1E-09	95% KM (bootstrap t) UCL	0.116				
811					Maximum	0.45	95% KM (BCA) UCL	0.0928				
812					Mean	0.0602	95% KM (Percentile Bootstrap) UCL	0.0917				
813					Median	0.017	95% KM (Chebyshev) UCL	0.142				
814					SD	0.114	97.5% KM (Chebyshev) UCL	0.179				
815					k star	0.225	99% KM (Chebyshev) UCL	0.251				
816					Theta star	0.267						
817					Nu star	15.76	**Potential UCLs to Use**					
818					AppChi2	7.79	97.5% KM (Chebyshev) UCL	0.179				
819					95% Gamma Approximate UCL	0.122						
820					95% Adjusted Gamma UCL	0.126						
821	**Note: DL/2 is not a recommended method.**											
822												
823												
824	**Zinc, dissolved (mw-12)**											
825												
826	**General Statistics**											
827					Number of Valid Data	41	Number of Detected Data	30				
828					Number of Distinct Detected Data	26	Number of Non-Detect Data	11				
829							Percent Non-Detects	26.83%				
830												
831	**Raw Statistics**						**Log-transformed Statistics**					
832					Minimum Detected	0.0046	Minimum Detected	-5.382				
833					Maximum Detected	0.54	Maximum Detected	-0.616				
834					Mean of Detected	0.0522	Mean of Detected	-3.577				
835					SD of Detected	0.0969	SD of Detected	0.996				
836					Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605				
837					Maximum Non-Detect	0.0261	Maximum Non-Detect	-3.646				
838												
839	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	29				
840	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	12				
841	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	70.73%				
842												
843	**UCL Statistics**											
844	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
845					Shapiro Wilk Test Statistic	0.43	Shapiro Wilk Test Statistic	0.946				
846					5% Shapiro Wilk Critical Value	0.927	5% Shapiro Wilk Critical Value	0.927				
847	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
848												

	A	B	C	D	E	F	G	H	I	J	K	L
849	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
850	DL/2 Substitution Method						DL/2 Substitution Method					
851	Mean					0.0402	Mean					-3.948
852	SD					0.0849	SD					1.069
853	95% DL/2 (t) UCL					0.0626	95% H-Stat (DL/2) UCL					0.0373
854												
855	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
856	**MLE yields a negative mean**						Mean in Log Scale					-3.955
857							SD in Log Scale					1.098
858							Mean in Original Scale					0.0403
859							SD in Original Scale					0.0849
860							95% Percentile Bootstrap UCL					0.0642
861							95% BCA Bootstrap UCL					0.0804
862												
863	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
864	k star (bias corrected)					0.861	**Data appear Lognormal at 5% Significance Level**					
865	Theta Star					0.0606						
866	nu star					51.67						
867												
868	A-D Test Statistic					1.711	**Nonparametric Statistics**					
869	5% A-D Critical Value					0.779	Kaplan-Meier (KM) Method					
870	K-S Test Statistic					0.779	Mean					0.0407
871	5% K-S Critical Value					0.165	SD					0.0837
872	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0133
873							95% KM (t) UCL					0.0631
874	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0626
875	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.063
876	Minimum					1E-09	95% KM (bootstrap t) UCL					0.103
877	Maximum					0.54	95% KM (BCA) UCL					0.0689
878	Mean					0.0437	95% KM (Percentile Bootstrap) UCL					0.0653
879	Median					0.0192	95% KM (Chebyshev) UCL					0.0987
880	SD					0.0848	97.5% KM (Chebyshev) UCL					0.124
881	k star					0.307	99% KM (Chebyshev) UCL					0.173
882	Theta star					0.142						
883	Nu star					25.17	**Potential UCLs to Use**					
884	AppChi2					14.74	95% KM (BCA) UCL					0.0689
885	95% Gamma Approximate UCL					0.0746						
886	95% Adjusted Gamma UCL					0.0761						
887	**Note: DL/2 is not a recommended method.**											
888												
889												
890	**Zinc, dissolved (mw-13)**											
891												
892	**General Statistics**											
893	Number of Valid Data					27	Number of Detected Data					23
894	Number of Distinct Detected Data					23	Number of Non-Detect Data					4
895							Percent Non-Detects					14.81%
896												
897	**Raw Statistics**						**Log-transformed Statistics**					
898	Minimum Detected					0.0068	Minimum Detected					-4.991
899	Maximum Detected					0.451	Maximum Detected					-0.796
900	Mean of Detected					0.0911	Mean of Detected					-3.135
901	SD of Detected					0.119	SD of Detected					1.25

902				Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298	
903				Maximum Non-Detect	0.0758					Maximum Non-Detect	-2.58	
904												
905	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	20	
906	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	7	
907	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	74.07%	
908												
909	**UCL Statistics**											
910	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
911				Shapiro Wilk Test Statistic	0.719					Shapiro Wilk Test Statistic	0.942	
912				5% Shapiro Wilk Critical Value	0.914					5% Shapiro Wilk Critical Value	0.914	
913	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
914												
915	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
916				DL/2 Substitution Method						DL/2 Substitution Method		
917				Mean	0.0796					Mean	-3.381	
918				SD	0.113					SD	1.355	
919				95% DL/2 (t) UCL	0.117					95% H-Stat (DL/2) UCL	0.126	
920												
921				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
922				Mean	0.257					Mean in Log Scale	-3.41	
923				SD	0.113					SD in Log Scale	1.372	
924				95% MLE (t) UCL	0.294					Mean in Original Scale	0.079	
925				95% MLE (Tiku) UCL	0.328					SD in Original Scale	0.113	
926										95% Percentile Bootstrap UCL	0.116	
927										95% BCA Bootstrap UCL	0.13	
928												
929	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
930				k star (bias corrected)	0.727		**Data appear Lognormal at 5% Significance Level**					
931				Theta Star	0.125							
932				nu star	33.43							
933												
934				A-D Test Statistic	0.964		**Nonparametric Statistics**					
935				5% A-D Critical Value	0.78					Kaplan-Meier (KM) Method		
936				K-S Test Statistic	0.78					Mean	0.0794	
937				5% K-S Critical Value	0.188					SD	0.111	
938	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0218	
939										95% KM (t) UCL	0.117	
940	**Assuming Gamma Distribution**									95% KM (z) UCL	0.115	
941				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.116	
942				Minimum	1E-09					95% KM (bootstrap t) UCL	0.136	
943				Maximum	0.451					95% KM (BCA) UCL	0.119	
944				Mean	0.0797					95% KM (Percentile Bootstrap) UCL	0.117	
945				Median	0.031					95% KM (Chebyshev) UCL	0.174	
946				SD	0.113					97.5% KM (Chebyshev) UCL	0.216	
947				k star	0.269					99% KM (Chebyshev) UCL	0.296	
948				Theta star	0.297							
949				Nu star	14.5		**Potential UCLs to Use**					
950				AppChi2	6.918					97.5% KM (Chebyshev) UCL	0.216	
951				95% Gamma Approximate UCL	0.167							
952				95% Adjusted Gamma UCL	0.176							
953	**Note: DL/2 is not a recommended method.**											
954												

	A	B	C	D	E	F	G	H	I	J	K	L
955												
956	**Zinc, dissolved (mw-14)**											
957												
958						**General Statistics**						
959						Number of Valid Data	26				Number of Detected Data	24
960						Number of Distinct Detected Data	22				Number of Non-Detect Data	2
961											Percent Non-Detects	7.69%
962												
963				**Raw Statistics**					**Log-transformed Statistics**			
964						Minimum Detected	0.008				Minimum Detected	-4.828
965						Maximum Detected	0.498				Maximum Detected	-0.697
966						Mean of Detected	0.085				Mean of Detected	-3.13
967						SD of Detected	0.116				SD of Detected	1.145
968						Minimum Non-Detect	0.01				Minimum Non-Detect	-4.605
969						Maximum Non-Detect	0.0676				Maximum Non-Detect	-2.694
970												
971	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	19
972	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	7
973	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	73.08%
974												
975						**UCL Statistics**						
976				**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**			
977						Shapiro Wilk Test Statistic	0.67				Shapiro Wilk Test Statistic	0.954
978						5% Shapiro Wilk Critical Value	0.916				5% Shapiro Wilk Critical Value	0.916
979				**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**			
980												
981				**Assuming Normal Distribution**					**Assuming Lognormal Distribution**			
982						DL/2 Substitution Method					DL/2 Substitution Method	
983						Mean	0.08				Mean	-3.223
984						SD	0.113				SD	1.178
985						95% DL/2 (t) UCL	0.118				95% H-Stat (DL/2) UCL	0.121
986												
987						Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method	
988				**MLE yields a negative mean**							Mean in Log Scale	-3.228
989											SD in Log Scale	1.17
990											Mean in Original Scale	0.0797
991											SD in Original Scale	0.113
992											95% Percentile Bootstrap UCL	0.12
993											95% BCA Bootstrap UCL	0.129
994												
995				**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**			
996						k star (bias corrected)	0.799		**Data Follow Appr. Gamma Distribution at 5% Significance Level**			
997						Theta Star	0.106					
998						nu star	38.36					
999												
1000						A-D Test Statistic	0.913		**Nonparametric Statistics**			
1001						5% A-D Critical Value	0.777				Kaplan-Meier (KM) Method	
1002						K-S Test Statistic	0.777				Mean	0.0799
1003						5% K-S Critical Value	0.184				SD	0.111
1004				**Data follow Appr. Gamma Distribution at 5% Significance Level**							SE of Mean	0.0222
1005											95% KM (t) UCL	0.118
1006				**Assuming Gamma Distribution**							95% KM (z) UCL	0.116
1007				Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL	0.118

1008					Minimum	1E-09				95% KM (bootstrap t) UCL		0.145
1009					Maximum	0.498				95% KM (BCA) UCL		0.121
1010					Mean	0.0802				95% KM (Percentile Bootstrap) UCL		0.121
1011					Median	0.0405				95% KM (Chebyshev) UCL		0.177
1012					SD	0.113				97.5% KM (Chebyshev) UCL		0.218
1013					k star	0.464				99% KM (Chebyshev) UCL		0.301
1014					Theta star	0.173						
1015					Nu star	24.15				**Potential UCLs to Use**		
1016					AppChi2	13.96				95% KM (Chebyshev) UCL		0.177
1017					95% Gamma Approximate UCL	0.139						
1018					95% Adjusted Gamma UCL	0.144						
1019	**Note: DL/2 is not a recommended method.**											
1020												
1021												
1022	**Zinc, dissolved (mw-15)**											
1023												
1024						**General Statistics**						
1025					Number of Valid Data	24				Number of Detected Data		21
1026					Number of Distinct Detected Data	21				Number of Non-Detect Data		3
1027										Percent Non-Detects		12.50%
1028												
1029					**Raw Statistics**					**Log-transformed Statistics**		
1030					Minimum Detected	0.004				Minimum Detected		-5.521
1031					Maximum Detected	0.419				Maximum Detected		-0.87
1032					Mean of Detected	0.0692				Mean of Detected		-3.452
1033					SD of Detected	0.106				SD of Detected		1.254
1034					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
1035					Maximum Non-Detect	0.0356				Maximum Non-Detect		-3.335
1036												
1037	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		13
1038	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		11
1039	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		54.17%
1040												
1041						**UCL Statistics**						
1042					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
1043					Shapiro Wilk Test Statistic	0.606				Shapiro Wilk Test Statistic		0.957
1044					5% Shapiro Wilk Critical Value	0.908				5% Shapiro Wilk Critical Value		0.908
1045					**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
1046												
1047					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
1048					DL/2 Substitution Method					DL/2 Substitution Method		
1049					Mean	0.0616				Mean		-3.659
1050					SD	0.101				SD		1.329
1051					95% DL/2 (t) UCL	0.0968				95% H-Stat (DL/2) UCL		0.125
1052												
1053					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1054					**MLE yields a negative mean**					Mean in Log Scale		-3.677
1055										SD in Log Scale		1.335
1056										Mean in Original Scale		0.0613
1057										SD in Original Scale		0.101
1058										95% Percentile Bootstrap UCL		0.0977
1059										95% BCA Bootstrap UCL		0.112
1060												

	A	B	C	D	E	F	G	H	I	J	K	L
1061	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1062					k star (bias corrected)	0.687	**Data appear Lognormal at 5% Significance Level**					
1063					Theta Star	0.101						
1064					nu star	28.84						
1065												
1066					A-D Test Statistic	1.01	**Nonparametric Statistics**					
1067					5% A-D Critical Value	0.782					Kaplan-Meier (KM) Method	
1068					K-S Test Statistic	0.782					Mean	0.0615
1069					5% K-S Critical Value	0.197					SD	0.0985
1070	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0206
1071											95% KM (t) UCL	0.0968
1072	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0954
1073					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0966
1074					Minimum	1E-09					95% KM (bootstrap t) UCL	0.129
1075					Maximum	0.419					95% KM (BCA) UCL	0.101
1076					Mean	0.0609					95% KM (Percentile Bootstrap) UCL	0.0978
1077					Median	0.0265					95% KM (Chebyshev) UCL	0.151
1078					SD	0.101					97.5% KM (Chebyshev) UCL	0.19
1079					k star	0.307					99% KM (Chebyshev) UCL	0.267
1080					Theta star	0.199						
1081					Nu star	14.71	**Potential UCLs to Use**					
1082					AppChi2	7.063					97.5% KM (Chebyshev) UCL	0.19
1083					95% Gamma Approximate UCL	0.127						
1084					95% Adjusted Gamma UCL	0.134						
1085	**Note: DL/2 is not a recommended method.**											
1086												
1087												
1088	**Zinc, dissolved (mw-19)**											
1089												
1090	**General Statistics**											
1091					Number of Valid Data	22					Number of Detected Data	19
1092					Number of Distinct Detected Data	18					Number of Non-Detect Data	3
1093											Percent Non-Detects	13.64%
1094												
1095	**Raw Statistics**						**Log-transformed Statistics**					
1096					Minimum Detected	0.011					Minimum Detected	-4.51
1097					Maximum Detected	0.398					Maximum Detected	-0.921
1098					Mean of Detected	0.0869					Mean of Detected	-3.018
1099					SD of Detected	0.111					SD of Detected	1.049
1100					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
1101					Maximum Non-Detect	0.0315					Maximum Non-Detect	-3.458
1102												
1103	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	11
1104	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	11
1105	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	50.00%
1106												
1107	**UCL Statistics**											
1108	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1109					Shapiro Wilk Test Statistic	0.669					Shapiro Wilk Test Statistic	0.938
1110					5% Shapiro Wilk Critical Value	0.901					5% Shapiro Wilk Critical Value	0.901
1111	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1112												
1113	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					

1114				DL/2 Substitution Method						DL/2 Substitution Method		
1115				Mean	0.0764					Mean		-3.245
1116				SD	0.106					SD		1.148
1117				95% DL/2 (t) UCL	0.115					95% H-Stat (DL/2) UCL		0.0931
1118												
1119				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
1120				Mean	0.0146					Mean in Log Scale		-3.245
1121				SD	0.165					SD in Log Scale		1.16
1122				95% MLE (t) UCL	0.0751					Mean in Original Scale		0.0765
1123				95% MLE (Tiku) UCL	0.0895					SD in Original Scale		0.106
1124										95% Percentile Bootstrap UCL		0.116
1125										95% BCA Bootstrap UCL		0.126
1126												
1127	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
1128				k star (bias corrected)	0.881					**Data appear Lognormal at 5% Significance Level**		
1129				Theta Star	0.0987							
1130				nu star	33.47							
1131												
1132				A-D Test Statistic	0.928					**Nonparametric Statistics**		
1133				5% A-D Critical Value	0.769					Kaplan-Meier (KM) Method		
1134				K-S Test Statistic	0.769					Mean		0.0771
1135				5% K-S Critical Value	0.204					SD		0.104
1136	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.0227
1137										95% KM (t) UCL		0.116
1138	**Assuming Gamma Distribution**									95% KM (z) UCL		0.114
1139				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.116
1140				Minimum	1E-09					95% KM (bootstrap t) UCL		0.162
1141				Maximum	0.398					95% KM (BCA) UCL		0.12
1142				Mean	0.076					95% KM (Percentile Bootstrap) UCL		0.116
1143				Median	0.034					95% KM (Chebyshev) UCL		0.176
1144				SD	0.107					97.5% KM (Chebyshev) UCL		0.219
1145				k star	0.311					99% KM (Chebyshev) UCL		0.303
1146				Theta star	0.244							
1147				Nu star	13.7					**Potential UCLs to Use**		
1148				AppChi2	6.37					97.5% KM (Chebyshev) UCL		0.219
1149				95% Gamma Approximate UCL	0.163							
1150				95% Adjusted Gamma UCL	0.174							
1151	**Note: DL/2 is not a recommended method.**											
1152												
1153												
1154	**Zinc, dissolved (mw-20-100)**											
1155												
1156						**General Statistics**							
1157				Number of Valid Data	23					Number of Detected Data		21
1158				Number of Distinct Detected Data	19					Number of Non-Detect Data		2
1159										Percent Non-Detects		8.70%
1160												
1161	**Raw Statistics**									**Log-transformed Statistics**		
1162				Minimum Detected	0.0065					Minimum Detected		-5.036
1163				Maximum Detected	0.486					Maximum Detected		-0.722
1164				Mean of Detected	0.0996					Mean of Detected		-2.802
1165				SD of Detected	0.112					SD of Detected		1.038
1166				Minimum Non-Detect	0.01					Minimum Non-Detect		-4.605

1167					Maximum Non-Detect	0.0558					Maximum Non-Detect	-2.886
1168												
1169	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	13
1170	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	10
1171	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	56.52%
1172												
1173	**UCL Statistics**											
1174	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1175					Shapiro Wilk Test Statistic	0.728					Shapiro Wilk Test Statistic	0.975
1176					5% Shapiro Wilk Critical Value	0.908					5% Shapiro Wilk Critical Value	0.908
1177	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1178												
1179	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1180					DL/2 Substitution Method						DL/2 Substitution Method	
1181					Mean	0.0924					Mean	-2.945
1182					SD	0.109					SD	1.127
1183					95% DL/2 (t) UCL	0.131					95% H-Stat (DL/2) UCL	0.14
1184												
1185					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
1186					Mean	0.0178					Mean in Log Scale	-2.927
1187					SD	0.181					SD in Log Scale	1.09
1188					95% MLE (t) UCL	0.0825					Mean in Original Scale	0.0925
1189					95% MLE (Tiku) UCL	0.105					SD in Original Scale	0.109
1190											95% Percentile Bootstrap UCL	0.131
1191											95% BCA Bootstrap UCL	0.143
1192												
1193	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1194					k star (bias corrected)	1.015	**Data appear Gamma Distributed at 5% Significance Level**					
1195					Theta Star	0.0982						
1196					nu star	42.61						
1197												
1198					A-D Test Statistic	0.561	**Nonparametric Statistics**					
1199					5% A-D Critical Value	0.766					Kaplan-Meier (KM) Method	
1200					K-S Test Statistic	0.766					Mean	0.0925
1201					5% K-S Critical Value	0.194					SD	0.107
1202	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0228
1203											95% KM (t) UCL	0.132
1204	**Assuming Gamma Distribution**										95% KM (z) UCL	0.13
1205					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.131
1206					Minimum	1E-09					95% KM (bootstrap t) UCL	0.157
1207					Maximum	0.486					95% KM (BCA) UCL	0.131
1208					Mean	0.0927					95% KM (Percentile Bootstrap) UCL	0.133
1209					Median	0.0506					95% KM (Chebyshev) UCL	0.192
1210					SD	0.109					97.5% KM (Chebyshev) UCL	0.235
1211					k star	0.479					99% KM (Chebyshev) UCL	0.32
1212					Theta star	0.193						
1213					Nu star	22.03	**Potential UCLs to Use**					
1214					AppChi2	12.36					95% KM (Chebyshev) UCL	0.192
1215					95% Gamma Approximate UCL	0.165						
1216					95% Adjusted Gamma UCL	0.172						
1217	**Note: DL/2 is not a recommended method.**											
1218												
1219												

1220	**Zinc, dissolved (mw-20-130)**											
1221												
1222						**General Statistics**						
1223					Number of Valid Data	34			Number of Detected Data	27		
1224					Number of Distinct Detected Data	26			Number of Non-Detect Data	7		
1225									Percent Non-Detects	20.59%		
1226												
1227					**Raw Statistics**				**Log-transformed Statistics**			
1228					Minimum Detected	0.0102			Minimum Detected	-4.585		
1229					Maximum Detected	0.445			Maximum Detected	-0.81		
1230					Mean of Detected	0.097			Mean of Detected	-2.786		
1231					SD of Detected	0.0974			SD of Detected	0.991		
1232					Minimum Non-Detect	0.01			Minimum Non-Detect	-4.605		
1233					Maximum Non-Detect	0.1			Maximum Non-Detect	-2.303		
1234												
1235	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	24		
1236	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	10		
1237	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	70.59%		
1238												
1239						**UCL Statistics**						
1240					**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**			
1241					Shapiro Wilk Test Statistic	0.774			Shapiro Wilk Test Statistic	0.951		
1242					5% Shapiro Wilk Critical Value	0.923			5% Shapiro Wilk Critical Value	0.923		
1243					**Data not Normal at 5% Significance Level**				**Data appear Lognormal at 5% Significance Level**			
1244												
1245					**Assuming Normal Distribution**				**Assuming Lognormal Distribution**			
1246					DL/2 Substitution Method				DL/2 Substitution Method			
1247					Mean	0.0798			Mean	-3.187		
1248					SD	0.0933			SD	1.244		
1249					95% DL/2 (t) UCL	0.107			95% H-Stat (DL/2) UCL	0.0973		
1250												
1251					Maximum Likelihood Estimate(MLE) Method				Log ROS Method			
1252					Mean	0.219			Mean in Log Scale	-3.179		
1253					SD	0.0853			SD in Log Scale	1.206		
1254					95% MLE (t) UCL	0.244			Mean in Original Scale	0.0793		
1255					95% MLE (Tiku) UCL	0.264			SD in Original Scale	0.0935		
1256									95% Percentile Bootstrap UCL	0.105		
1257									95% BCA Bootstrap UCL	0.113		
1258												
1259					**Gamma Distribution Test with Detected Values Only**				**Data Distribution Test with Detected Values Only**			
1260					k star (bias corrected)	1.13			**Data appear Lognormal at 5% Significance Level**			
1261					Theta Star	0.0859						
1262					nu star	61.01						
1263												
1264					A-D Test Statistic	0.861			**Nonparametric Statistics**			
1265					5% A-D Critical Value	0.768			Kaplan-Meier (KM) Method			
1266					K-S Test Statistic	0.768			Mean	0.08		
1267					5% K-S Critical Value	0.172			SD	0.0917		
1268					**Data not Gamma Distributed at 5% Significance Level**				SE of Mean	0.016		
1269									95% KM (t) UCL	0.107		
1270					**Assuming Gamma Distribution**				95% KM (z) UCL	0.106		
1271					Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL	0.106		
1272					Minimum	1E-09			95% KM (bootstrap t) UCL	0.116		

1273					Maximum	0.445				95% KM (BCA) UCL		0.108
1274					Mean	0.0807				95% KM (Percentile Bootstrap) UCL		0.108
1275					Median	0.0444				95% KM (Chebyshev) UCL		0.15
1276					SD	0.0933				97.5% KM (Chebyshev) UCL		0.18
1277					k star	0.325				99% KM (Chebyshev) UCL		0.239
1278					Theta star	0.248						
1279					Nu star	22.09				**Potential UCLs to Use**		
1280					AppChi2	12.4				95% KM (BCA) UCL		0.108
1281					95% Gamma Approximate UCL	0.144						
1282					95% Adjusted Gamma UCL	0.148						
1283	**Note: DL/2 is not a recommended method.**											
1284												
1285												
1286	**Zinc, dissolved (mw-20-70)**											
1287												
1288					**General Statistics**							
1289					Number of Valid Data	36				Number of Detected Data		28
1290					Number of Distinct Detected Data	27				Number of Non-Detect Data		8
1291										Percent Non-Detects		22.22%
1292												
1293					**Raw Statistics**					**Log-transformed Statistics**		
1294					Minimum Detected	0.0112				Minimum Detected		-4.492
1295					Maximum Detected	0.53				Maximum Detected		-0.635
1296					Mean of Detected	0.0912				Mean of Detected		-3.056
1297					SD of Detected	0.129				SD of Detected		1.101
1298					Minimum Non-Detect	0.01				Minimum Non-Detect		-4.605
1299					Maximum Non-Detect	0.0611				Maximum Non-Detect		-2.795
1300												
1301	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		25
1302	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		11
1303	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		69.44%
1304												
1305					**UCL Statistics**							
1306					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
1307					Shapiro Wilk Test Statistic	0.622				Shapiro Wilk Test Statistic		0.9
1308					5% Shapiro Wilk Critical Value	0.924				5% Shapiro Wilk Critical Value		0.924
1309					**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**		
1310												
1311					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
1312					DL/2 Substitution Method					DL/2 Substitution Method		
1313					Mean	0.073				Mean		-3.466
1314					SD	0.119				SD		1.274
1315					95% DL/2 (t) UCL	0.106				95% H-Stat (DL/2) UCL		0.101
1316												
1317					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1318					**MLE yields a negative mean**					Mean in Log Scale		-3.539
1319										SD in Log Scale		1.368
1320										Mean in Original Scale		0.0724
1321										SD in Original Scale		0.119
1322										95% Percentile Bootstrap UCL		0.107
1323										95% BCA Bootstrap UCL		0.12
1324												
1325					**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**		

1326				k star (bias corrected)	0.815	**Data do not follow a Discernable Distribution (0.05)**						
1327				Theta Star	0.112							
1328				nu star	45.63							
1329												
1330				A-D Test Statistic	1.744	**Nonparametric Statistics**						
1331				5% A-D Critical Value	0.779	Kaplan-Meier (KM) Method						
1332				K-S Test Statistic	0.779	Mean	0.0738					
1333				5% K-S Critical Value	0.171	SD	0.117					
1334	**Data not Gamma Distributed at 5% Significance Level**					SE of Mean	0.0198					
1335						95% KM (t) UCL	0.107					
1336	**Assuming Gamma Distribution**					95% KM (z) UCL	0.106					
1337	Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL	0.107					
1338				Minimum	1E-09	95% KM (bootstrap t) UCL	0.137					
1339				Maximum	0.53	95% KM (BCA) UCL	0.109					
1340				Mean	0.0735	95% KM (Percentile Bootstrap) UCL	0.108					
1341				Median	0.0254	95% KM (Chebyshev) UCL	0.16					
1342				SD	0.119	97.5% KM (Chebyshev) UCL	0.197					
1343				k star	0.215	99% KM (Chebyshev) UCL	0.271					
1344				Theta star	0.342							
1345				Nu star	15.48	**Potential UCLs to Use**						
1346				AppChi2	7.595	97.5% KM (Chebyshev) UCL	0.197					
1347				95% Gamma Approximate UCL	0.15							
1348				95% Adjusted Gamma UCL	0.155							
1349	**Note: DL/2 is not a recommended method.**											
1350												
1351												
1352	**Zinc, dissolved (mw-21)**											
1353												
1354	**General Statistics**											
1355				Number of Valid Data	25	Number of Detected Data	20					
1356				Number of Distinct Detected Data	19	Number of Non-Detect Data	5					
1357						Percent Non-Detects	20.00%					
1358												
1359	**Raw Statistics**					**Log-transformed Statistics**						
1360				Minimum Detected	0.0053	Minimum Detected	-5.24					
1361				Maximum Detected	0.692	Maximum Detected	-0.368					
1362				Mean of Detected	0.181	Mean of Detected	-2.68					
1363				SD of Detected	0.215	SD of Detected	1.616					
1364				Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298					
1365				Maximum Non-Detect	0.097	Maximum Non-Detect	-2.333					
1366												
1367	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect	17					
1368	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected	8					
1369	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage	68.00%					
1370												
1371	**UCL Statistics**											
1372	**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**						
1373				Shapiro Wilk Test Statistic	0.795	Shapiro Wilk Test Statistic	0.914					
1374				5% Shapiro Wilk Critical Value	0.905	5% Shapiro Wilk Critical Value	0.905					
1375	**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**						
1376												
1377	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
1378				DL/2 Substitution Method		DL/2 Substitution Method						

1379					Mean	0.148					Mean	-3.057
1380					SD	0.203					SD	1.687
1381					95% DL/2 (t) UCL	0.218					95% H-Stat (DL/2) UCL	0.352
1382												
1383					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1384					**MLE yields a negative mean**						Mean in Log Scale	-3.116
1385											SD in Log Scale	1.76
1386											Mean in Original Scale	0.147
1387											SD in Original Scale	0.203
1388											95% Percentile Bootstrap UCL	0.215
1389											95% BCA Bootstrap UCL	0.223
1390												
1391					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
1392					k star (bias corrected)	0.57					**Data appear Gamma Distributed at 5% Significance Level**	
1393					Theta Star	0.318						
1394					nu star	22.79						
1395												
1396					A-D Test Statistic	0.723					**Nonparametric Statistics**	
1397					5% A-D Critical Value	0.79					Kaplan-Meier (KM) Method	
1398					K-S Test Statistic	0.79					Mean	0.148
1399					5% K-S Critical Value	0.203					SD	0.199
1400					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0409
1401											95% KM (t) UCL	0.218
1402					**Assuming Gamma Distribution**						95% KM (z) UCL	0.215
1403					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.217
1404					Minimum	1E-09					95% KM (bootstrap t) UCL	0.236
1405					Maximum	0.692					95% KM (BCA) UCL	0.213
1406					Mean	0.154					95% KM (Percentile Bootstrap) UCL	0.216
1407					Median	0.0746					95% KM (Chebyshev) UCL	0.326
1408					SD	0.2					97.5% KM (Chebyshev) UCL	0.403
1409					k star	0.295					99% KM (Chebyshev) UCL	0.554
1410					Theta star	0.523						
1411					Nu star	14.74					**Potential UCLs to Use**	
1412					AppChi2	7.083					95% KM (Chebyshev) UCL	0.326
1413					95% Gamma Approximate UCL	0.321						
1414					95% Adjusted Gamma UCL	0.338						
1415	**Note: DL/2 is not a recommended method.**											
1416												
1417												
1418	**Zinc, dissolved (mw-22)**											
1419												
1420							**General Statistics**					
1421					Number of Valid Data	27					Number of Detected Data	22
1422					Number of Distinct Detected Data	18					Number of Non-Detect Data	5
1423											Percent Non-Detects	18.52%
1424												
1425					**Raw Statistics**						**Log-transformed Statistics**	
1426					Minimum Detected	0.0068					Minimum Detected	-4.991
1427					Maximum Detected	0.734					Maximum Detected	-0.309
1428					Mean of Detected	0.0911					Mean of Detected	-3.178
1429					SD of Detected	0.154					SD of Detected	1.251
1430					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
1431					Maximum Non-Detect	0.0487					Maximum Non-Detect	-3.022

1432												
1433	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	16
1434	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	11
1435	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	59.26%
1436												
1437	**UCL Statistics**											
1438	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1439	Shapiro Wilk Test Statistic				0.521		Shapiro Wilk Test Statistic					0.937
1440	5% Shapiro Wilk Critical Value				0.911		5% Shapiro Wilk Critical Value					0.911
1441	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1442												
1443	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1444	DL/2 Substitution Method						DL/2 Substitution Method					
1445	Mean				0.0763		Mean					-3.461
1446	SD				0.142		SD					1.315
1447	95% DL/2 (t) UCL				0.123		95% H-Stat (DL/2) UCL					0.104
1448												
1449	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
1450	**MLE yields a negative mean**						Mean in Log Scale					-3.492
1451							SD in Log Scale					1.357
1452							Mean in Original Scale					0.076
1453							SD in Original Scale					0.142
1454							95% Percentile Bootstrap UCL					0.125
1455							95% BCA Bootstrap UCL					0.153
1456												
1457	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1458	k star (bias corrected)				0.69		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
1459	Theta Star				0.132							
1460	nu star				30.34							
1461												
1462	A-D Test Statistic				0.851		**Nonparametric Statistics**					
1463	5% A-D Critical Value				0.782		Kaplan-Meier (KM) Method					
1464	K-S Test Statistic				0.782		Mean					0.0762
1465	5% K-S Critical Value				0.193		SD					0.139
1466	**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean					0.0274
1467							95% KM (t) UCL					0.123
1468	**Assuming Gamma Distribution**						95% KM (z) UCL					0.121
1469	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.123
1470	Minimum				1E-09		95% KM (bootstrap t) UCL					0.184
1471	Maximum				0.734		95% KM (BCA) UCL					0.128
1472	Mean				0.0778		95% KM (Percentile Bootstrap) UCL					0.124
1473	Median				0.0315		95% KM (Chebyshev) UCL					0.196
1474	SD				0.141		97.5% KM (Chebyshev) UCL					0.247
1475	k star				0.328		99% KM (Chebyshev) UCL					0.349
1476	Theta star				0.237							
1477	Nu star				17.73		**Potential UCLs to Use**					
1478	AppChi2				9.195		95% KM (Chebyshev) UCL					0.196
1479	95% Gamma Approximate UCL				0.15							
1480	95% Adjusted Gamma UCL				0.157							
1481	**Note: DL/2 is not a recommended method.**											
1482												
1483												
1484	**Zinc, dissolved (mw-23)**											

1485												
1486	**General Statistics**											
1487					Number of Valid Data	26				Number of Detected Data		22
1488					Number of Distinct Detected Data	22				Number of Non-Detect Data		4
1489										Percent Non-Detects		15.38%
1490												
1491	**Raw Statistics**							**Log-transformed Statistics**				
1492					Minimum Detected	0.0066				Minimum Detected		-5.021
1493					Maximum Detected	0.817				Maximum Detected		-0.202
1494					Mean of Detected	0.123				Mean of Detected		-3.092
1495					SD of Detected	0.198				SD of Detected		1.464
1496					Minimum Non-Detect	0.02				Minimum Non-Detect		-3.912
1497					Maximum Non-Detect	0.0405				Maximum Non-Detect		-3.206
1498												
1499	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
1500	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		12
1501	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		53.85%
1502												
1503	**UCL Statistics**											
1504	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
1505					Shapiro Wilk Test Statistic	0.622				Shapiro Wilk Test Statistic		0.938
1506					5% Shapiro Wilk Critical Value	0.911				5% Shapiro Wilk Critical Value		0.911
1507	**Data not Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
1508												
1509	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
1510					DL/2 Substitution Method					DL/2 Substitution Method		
1511					Mean	0.106				Mean		-3.297
1512					SD	0.186				SD		1.434
1513					95% DL/2 (t) UCL	0.168				95% H-Stat (DL/2) UCL		0.155
1514												
1515					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1516	**MLE yields a negative mean**									Mean in Log Scale		-3.324
1517										SD in Log Scale		1.464
1518										Mean in Original Scale		0.106
1519										SD in Original Scale		0.186
1520										95% Percentile Bootstrap UCL		0.167
1521										95% BCA Bootstrap UCL		0.19
1522												
1523	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
1524					k star (bias corrected)	0.565		**Data Follow Appr. Gamma Distribution at 5% Significance Level**				
1525					Theta Star	0.217						
1526					nu star	24.84						
1527												
1528					A-D Test Statistic	0.867		**Nonparametric Statistics**				
1529					5% A-D Critical Value	0.794				Kaplan-Meier (KM) Method		
1530					K-S Test Statistic	0.794				Mean		0.105
1531					5% K-S Critical Value	0.194				SD		0.183
1532	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean		0.0367
1533										95% KM (t) UCL		0.168
1534	**Assuming Gamma Distribution**									95% KM (z) UCL		0.166
1535					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.168
1536					Minimum	1E-09				95% KM (bootstrap t) UCL		0.244
1537					Maximum	0.817				95% KM (BCA) UCL		0.177

1538					Mean	0.105				95% KM (Percentile Bootstrap) UCL		0.17
1539					Median	0.0384				95% KM (Chebyshev) UCL		0.265
1540					SD	0.187				97.5% KM (Chebyshev) UCL		0.335
1541					k star	0.29				99% KM (Chebyshev) UCL		0.471
1542					Theta star	0.362						
1543					Nu star	15.07				**Potential UCLs to Use**		
1544					AppChi2	7.307				95% KM (Chebyshev) UCL		0.265
1545					95% Gamma Approximate UCL	0.216						
1546					95% Adjusted Gamma UCL	0.227						
1547	**Note: DL/2 is not a recommended method.**											
1548												
1549												
1550	**Zinc, dissolved (mw-24a)**											
1551												
1552					**General Statistics**							
1553					Number of Valid Data	25				Number of Detected Data		21
1554					Number of Distinct Detected Data	21				Number of Non-Detect Data		4
1555										Percent Non-Detects		16.00%
1556												
1557					**Raw Statistics**					**Log-transformed Statistics**		
1558					Minimum Detected	0.0056				Minimum Detected		-5.185
1559					Maximum Detected	0.62				Maximum Detected		-0.478
1560					Mean of Detected	0.104				Mean of Detected		-2.947
1561					SD of Detected	0.149				SD of Detected		1.144
1562					Minimum Non-Detect	0.02				Minimum Non-Detect		-3.912
1563					Maximum Non-Detect	0.0541				Maximum Non-Detect		-2.917
1564												
1565	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		16
1566	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		9
1567	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		64.00%
1568												
1569					**UCL Statistics**							
1570					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
1571					Shapiro Wilk Test Statistic	0.636				Shapiro Wilk Test Statistic		0.96
1572					5% Shapiro Wilk Critical Value	0.908				5% Shapiro Wilk Critical Value		0.908
1573					**Data not Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**		
1574												
1575					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
1576					DL/2 Substitution Method					DL/2 Substitution Method		
1577					Mean	0.0893				Mean		-3.172
1578					SD	0.14				SD		1.183
1579					95% DL/2 (t) UCL	0.137				95% H-Stat (DL/2) UCL		0.0973
1580												
1581					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
1582					**MLE yields a negative mean**					Mean in Log Scale		-3.196
1583										SD in Log Scale		1.214
1584										Mean in Original Scale		0.089
1585										SD in Original Scale		0.14
1586										95% Percentile Bootstrap UCL		0.139
1587										95% BCA Bootstrap UCL		0.154
1588												
1589					**Gamma Distribution Test with Detected Values Only**					**Data Distribution Test with Detected Values Only**		
1590					k star (bias corrected)	0.773				**Data Follow Appr. Gamma Distribution at 5% Significance Level**		

1591					Theta Star	0.134						
1592					nu star	32.47						
1593												
1594					A-D Test Statistic	1.089	**Nonparametric Statistics**					
1595					5% A-D Critical Value	0.777	Kaplan-Meier (KM) Method					
1596					K-S Test Statistic	0.777	Mean	0.0896				
1597					5% K-S Critical Value	0.196	SD	0.137				
1598	**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean	0.028				
1599							95% KM (t) UCL	0.138				
1600	**Assuming Gamma Distribution**						95% KM (z) UCL	0.136				
1601	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.137				
1602					Minimum	1E-09	95% KM (bootstrap t) UCL	0.187				
1603					Maximum	0.62	95% KM (BCA) UCL	0.132				
1604					Mean	0.0889	95% KM (Percentile Bootstrap) UCL	0.139				
1605					Median	0.0327	95% KM (Chebyshev) UCL	0.212				
1606					SD	0.14	97.5% KM (Chebyshev) UCL	0.265				
1607					k star	0.259	99% KM (Chebyshev) UCL	0.369				
1608					Theta star	0.343						
1609					Nu star	12.96	**Potential UCLs to Use**					
1610					AppChi2	5.865	95% KM (Chebyshev) UCL	0.212				
1611					95% Gamma Approximate UCL	0.196						
1612					95% Adjusted Gamma UCL	0.208						
1613	**Note: DL/2 is not a recommended method.**											
1614												
1615												
1616	**Zinc, dissolved (mw-24b)**											
1617												
1618	**General Statistics**											
1619					Number of Valid Data	23	Number of Detected Data	20				
1620					Number of Distinct Detected Data	18	Number of Non-Detect Data	3				
1621							Percent Non-Detects	13.04%				
1622												
1623	**Raw Statistics**						**Log-transformed Statistics**					
1624					Minimum Detected	0.0096	Minimum Detected	-4.646				
1625					Maximum Detected	0.468	Maximum Detected	-0.759				
1626					Mean of Detected	0.0868	Mean of Detected	-3.107				
1627					SD of Detected	0.124	SD of Detected	1.089				
1628					Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298				
1629					Maximum Non-Detect	0.0805	Maximum Non-Detect	-2.519				
1630												
1631	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	19				
1632	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	4				
1633	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	82.61%				
1634												
1635	**UCL Statistics**											
1636	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1637					Shapiro Wilk Test Statistic	0.625	Shapiro Wilk Test Statistic	0.915				
1638					5% Shapiro Wilk Critical Value	0.905	5% Shapiro Wilk Critical Value	0.905				
1639	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1640												
1641	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1642					DL/2 Substitution Method		DL/2 Substitution Method					
1643					Mean	0.0775	Mean	-3.362				

1644					SD	0.118					SD	1.309
1645					95% DL/2 (t) UCL	0.12					95% H-Stat (DL/2) UCL	0.148
1646												
1647					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
1648					**MLE yields a negative mean**						Mean in Log Scale	-3.345
1649											SD in Log Scale	1.24
1650											Mean in Original Scale	0.077
1651											SD in Original Scale	0.118
1652											95% Percentile Bootstrap UCL	0.12
1653											95% BCA Bootstrap UCL	0.136
1654												
1655					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
1656					k star (bias corrected)	0.785					**Data appear Lognormal at 5% Significance Level**	
1657					Theta Star	0.111						
1658					nu star	31.39						
1659												
1660					A-D Test Statistic	1.495					**Nonparametric Statistics**	
1661					5% A-D Critical Value	0.773					Kaplan-Meier (KM) Method	
1662					K-S Test Statistic	0.773					Mean	0.0777
1663					5% K-S Critical Value	0.2					SD	0.115
1664					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0247
1665											95% KM (t) UCL	0.12
1666					**Assuming Gamma Distribution**						95% KM (z) UCL	0.118
1667					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.12
1668					Minimum	1E-09					95% KM (bootstrap t) UCL	0.152
1669					Maximum	0.468					95% KM (BCA) UCL	0.121
1670					Mean	0.0787					95% KM (Percentile Bootstrap) UCL	0.121
1671					Median	0.03					95% KM (Chebyshev) UCL	0.185
1672					SD	0.118					97.5% KM (Chebyshev) UCL	0.232
1673					k star	0.314					99% KM (Chebyshev) UCL	0.323
1674					Theta star	0.251						
1675					Nu star	14.44					**Potential UCLs to Use**	
1676					AppChi2	6.872					97.5% KM (Chebyshev) UCL	0.232
1677					95% Gamma Approximate UCL	0.165						
1678					95% Adjusted Gamma UCL	0.175						
1679	**Note: DL/2 is not a recommended method.**											
1680												
1681												
1682	**Zinc, dissolved (mw-24br)**											
1683												
1684						**General Statistics**						
1685					Number of Valid Data	22					Number of Detected Data	19
1686					Number of Distinct Detected Data	17					Number of Non-Detect Data	3
1687											Percent Non-Detects	13.64%
1688												
1689					**Raw Statistics**						**Log-transformed Statistics**	
1690					Minimum Detected	0.009					Minimum Detected	-4.711
1691					Maximum Detected	0.152					Maximum Detected	-1.884
1692					Mean of Detected	0.068					Mean of Detected	-3.076
1693					SD of Detected	0.0516					SD of Detected	0.994
1694					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
1695					Maximum Non-Detect	0.0739					Maximum Non-Detect	-2.605
1696												

1697	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	15
1698	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	7
1699	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	68.18%
1700												
1701	**UCL Statistics**											
1702	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1703	Shapiro Wilk Test Statistic				0.877		Shapiro Wilk Test Statistic					0.884
1704	5% Shapiro Wilk Critical Value				0.901		5% Shapiro Wilk Critical Value					0.901
1705	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1706												
1707	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1708	DL/2 Substitution Method						DL/2 Substitution Method					
1709	Mean				0.061		Mean					-3.288
1710	SD				0.0514		SD					1.148
1711	95% DL/2 (t) UCL				0.0798		95% H-Stat (DL/2) UCL					0.107
1712												
1713	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
1714	Mean				0.128		Mean in Log Scale					-3.26
1715	SD				0.0151		SD in Log Scale					1.071
1716	95% MLE (t) UCL				0.134		Mean in Original Scale					0.0608
1717	95% MLE (Tiku) UCL				0.138		SD in Original Scale					0.0514
1718							95% Percentile Bootstrap UCL					0.0789
1719							95% BCA Bootstrap UCL					0.0794
1720												
1721	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1722	k star (bias corrected)				1.242		**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
1723	Theta Star				0.0548							
1724	nu star				47.18							
1725												
1726	A-D Test Statistic				0.795		**Nonparametric Statistics**					
1727	5% A-D Critical Value				0.759		Kaplan-Meier (KM) Method					
1728	K-S Test Statistic				0.759		Mean					0.0612
1729	5% K-S Critical Value				0.202		SD					0.0501
1730	**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean					0.011
1731							95% KM (t) UCL					0.0801
1732	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0793
1733	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.08
1734	Minimum				1E-09		95% KM (bootstrap t) UCL					0.0818
1735	Maximum				0.152		95% KM (BCA) UCL					0.0788
1736	Mean				0.0625		95% KM (Percentile Bootstrap) UCL					0.0787
1737	Median				0.0531		95% KM (Chebyshev) UCL					0.109
1738	SD				0.0505		97.5% KM (Chebyshev) UCL					0.13
1739	k star				0.512		99% KM (Chebyshev) UCL					0.171
1740	Theta star				0.122							
1741	Nu star				22.54		**Potential UCLs to Use**					
1742	AppChi2				12.74		95% KM (BCA) UCL					0.0788
1743	95% Gamma Approximate UCL				0.111							
1744	95% Adjusted Gamma UCL				0.116							
1745	**Note: DL/2 is not a recommended method.**											
1746												
1747												
1748	**Zinc, dissolved (mw-25)**											
1749												

1750	**General Statistics**											
1751					Number of Valid Data	29			Number of Detected Data			23
1752					Number of Distinct Detected Data	22			Number of Non-Detect Data			6
1753									Percent Non-Detects			20.69%
1754												
1755	**Raw Statistics**							**Log-transformed Statistics**				
1756					Minimum Detected	0.0073			Minimum Detected			-4.92
1757					Maximum Detected	0.555			Maximum Detected			-0.589
1758					Mean of Detected	0.0887			Mean of Detected			-3.075
1759					SD of Detected	0.125			SD of Detected			1.146
1760					Minimum Non-Detect	0.01			Minimum Non-Detect			-4.605
1761					Maximum Non-Detect	0.02			Maximum Non-Detect			-3.912
1762												
1763	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			12
1764	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			17
1765	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			41.38%
1766												
1767	**UCL Statistics**											
1768	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
1769					Shapiro Wilk Test Statistic	0.635			Shapiro Wilk Test Statistic			0.971
1770					5% Shapiro Wilk Critical Value	0.914			5% Shapiro Wilk Critical Value			0.914
1771	**Data not Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
1772												
1773	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
1774					DL/2 Substitution Method				DL/2 Substitution Method			
1775					Mean	0.0717			Mean			-3.488
1776					SD	0.116			SD			1.315
1777					95% DL/2 (t) UCL	0.108			95% H-Stat (DL/2) UCL			0.0804
1778												
1779					Maximum Likelihood Estimate(MLE) Method				Log ROS Method			
1780					Mean	0.0231			Mean in Log Scale			-3.523
1781					SD	0.162			SD in Log Scale			1.373
1782					95% MLE (t) UCL	0.0742			Mean in Original Scale			0.0716
1783					95% MLE (Tiku) UCL	0.0812			SD in Original Scale			0.116
1784									95% Percentile Bootstrap UCL			0.11
1785									95% BCA Bootstrap UCL			0.124
1786												
1787	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**				
1788					k star (bias corrected)	0.808		**Data appear Gamma Distributed at 5% Significance Level**				
1789					Theta Star	0.11						
1790					nu star	37.17						
1791												
1792					A-D Test Statistic	0.685		**Nonparametric Statistics**				
1793					5% A-D Critical Value	0.775			Kaplan-Meier (KM) Method			
1794					K-S Test Statistic	0.775			Mean			0.0721
1795					5% K-S Critical Value	0.188			SD			0.113
1796	**Data appear Gamma Distributed at 5% Significance Level**								SE of Mean			0.0215
1797									95% KM (t) UCL			0.109
1798	**Assuming Gamma Distribution**								95% KM (z) UCL			0.107
1799					Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL			0.108
1800					Minimum	1E-09			95% KM (bootstrap t) UCL			0.152
1801					Maximum	0.555			95% KM (BCA) UCL			0.111
1802					Mean	0.0715			95% KM (Percentile Bootstrap) UCL			0.111

1803					Median	0.027				95% KM (Chebyshev) UCL		0.166
1804					SD	0.116				97.5% KM (Chebyshev) UCL		0.206
1805					k star	0.211				99% KM (Chebyshev) UCL		0.286
1806					Theta star	0.339						
1807					Nu star	12.22				**Potential UCLs to Use**		
1808					AppChi2	5.37				95% KM (Chebyshev) UCL		0.166
1809					95% Gamma Approximate UCL	0.163						
1810					95% Adjusted Gamma UCL	0.171						
1811	**Note: DL/2 is not a recommended method.**											
1812												
1813												
1814	**Zinc, dissolved (mw-26)**											
1815												
1816	**General Statistics**											
1817					Number of Valid Data	25				Number of Detected Data		23
1818					Number of Distinct Detected Data	22				Number of Non-Detect Data		2
1819										Percent Non-Detects		8.00%
1820												
1821	**Raw Statistics**						**Log-transformed Statistics**					
1822					Minimum Detected	0.0088				Minimum Detected		-4.733
1823					Maximum Detected	0.514				Maximum Detected		-0.666
1824					Mean of Detected	0.105				Mean of Detected		-2.844
1825					SD of Detected	0.131				SD of Detected		1.119
1826					Minimum Non-Detect	0.02				Minimum Non-Detect		-3.912
1827					Maximum Non-Detect	0.0665				Maximum Non-Detect		-2.711
1828												
1829	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		14
1830	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		11
1831	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		56.00%
1832												
1833	**UCL Statistics**											
1834	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1835					Shapiro Wilk Test Statistic	0.699				Shapiro Wilk Test Statistic		0.972
1836					5% Shapiro Wilk Critical Value	0.914				5% Shapiro Wilk Critical Value		0.914
1837	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1838												
1839	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1840					DL/2 Substitution Method					DL/2 Substitution Method		
1841					Mean	0.0988				Mean		-2.937
1842					SD	0.127				SD		1.132
1843					95% DL/2 (t) UCL	0.142				95% H-Stat (DL/2) UCL		0.161
1844												
1845					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
1846					Mean	0.021				Mean in Log Scale		-2.941
1847					SD	0.203				SD in Log Scale		1.128
1848					95% MLE (t) UCL	0.0903				Mean in Original Scale		0.0985
1849					95% MLE (Tiku) UCL	0.114				SD in Original Scale		0.127
1850										95% Percentile Bootstrap UCL		0.14
1851										95% BCA Bootstrap UCL		0.16
1852												
1853	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1854					k star (bias corrected)	0.876	**Data appear Gamma Distributed at 5% Significance Level**					
1855					Theta Star	0.12						

1856					nu star	40.28						
1857												
1858					A-D Test Statistic	0.591	**Nonparametric Statistics**					
1859					5% A-D Critical Value	0.771					Kaplan-Meier (KM) Method	
1860					K-S Test Statistic	0.771					Mean	0.0986
1861					5% K-S Critical Value	0.187					SD	0.125
1862	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0255
1863											95% KM (t) UCL	0.142
1864	**Assuming Gamma Distribution**										95% KM (z) UCL	0.141
1865					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.142
1866					Minimum	1E-09					95% KM (bootstrap t) UCL	0.185
1867					Maximum	0.514					95% KM (BCA) UCL	0.138
1868					Mean	0.0983					95% KM (Percentile Bootstrap) UCL	0.143
1869					Median	0.039					95% KM (Chebyshev) UCL	0.21
1870					SD	0.127					97.5% KM (Chebyshev) UCL	0.258
1871					k star	0.469					99% KM (Chebyshev) UCL	0.352
1872					Theta star	0.21						
1873					Nu star	23.43	**Potential UCLs to Use**					
1874					AppChi2	13.41					95% KM (Chebyshev) UCL	0.21
1875					95% Gamma Approximate UCL	0.172						
1876					95% Adjusted Gamma UCL	0.178						
1877	**Note: DL/2 is not a recommended method.**											
1878												
1879												
1880	**Zinc, dissolved (mw-27-20)**											
1881												
1882	**General Statistics**											
1883					Number of Valid Data	22					Number of Detected Data	18
1884					Number of Distinct Detected Data	16					Number of Non-Detect Data	4
1885											Percent Non-Detects	18.18%
1886												
1887	**Raw Statistics**						**Log-transformed Statistics**					
1888					Minimum Detected	0.0053					Minimum Detected	-5.24
1889					Maximum Detected	0.44					Maximum Detected	-0.821
1890					Mean of Detected	0.0875					Mean of Detected	-3.29
1891					SD of Detected	0.119					SD of Detected	1.363
1892					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
1893					Maximum Non-Detect	0.194					Maximum Non-Detect	-1.64
1894												
1895	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	19
1896	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	3
1897	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	86.36%
1898												
1899	**UCL Statistics**											
1900	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1901					Shapiro Wilk Test Statistic	0.721					Shapiro Wilk Test Statistic	0.92
1902					5% Shapiro Wilk Critical Value	0.897					5% Shapiro Wilk Critical Value	0.897
1903	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
1904												
1905	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1906					DL/2 Substitution Method						DL/2 Substitution Method	
1907					Mean	0.0774					Mean	-3.463
1908					SD	0.111					SD	1.404

1909				95% DL/2 (t) UCL	0.118					95% H-Stat (DL/2) UCL	0.159	
1910												
1911				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
1912				**MLE yields a negative mean**						Mean in Log Scale	-3.573	
1913										SD in Log Scale	1.439	
1914										Mean in Original Scale	0.0736	
1915										SD in Original Scale	0.112	
1916										95% Percentile Bootstrap UCL	0.115	
1917										95% BCA Bootstrap UCL	0.127	
1918												
1919				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
1920				k star (bias corrected)	0.626					**Data Follow Appr. Gamma Distribution at 5% Significance Level**		
1921				Theta Star	0.14							
1922				nu star	22.53							
1923												
1924				A-D Test Statistic	0.892					**Nonparametric Statistics**		
1925				5% A-D Critical Value	0.782					Kaplan-Meier (KM) Method		
1926				K-S Test Statistic	0.782					Mean	0.0745	
1927				5% K-S Critical Value	0.212					SD	0.109	
1928				**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean	0.024	
1929										95% KM (t) UCL	0.116	
1930				**Assuming Gamma Distribution**						95% KM (z) UCL	0.114	
1931				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.116	
1932				Minimum	1E-09					95% KM (bootstrap t) UCL	0.14	
1933				Maximum	0.44					95% KM (BCA) UCL	0.117	
1934				Mean	0.0759					95% KM (Percentile Bootstrap) UCL	0.116	
1935				Median	0.0195					95% KM (Chebyshev) UCL	0.179	
1936				SD	0.111					97.5% KM (Chebyshev) UCL	0.225	
1937				k star	0.387					99% KM (Chebyshev) UCL	0.314	
1938				Theta star	0.196							
1939				Nu star	17.04					**Potential UCLs to Use**		
1940				AppChi2	8.698					95% KM (Chebyshev) UCL	0.179	
1941				95% Gamma Approximate UCL	0.149							
1942				95% Adjusted Gamma UCL	0.157							
1943	**Note: DL/2 is not a recommended method.**											
1944												
1945												
1946	**Zinc, dissolved (mw-28-25)**											
1947												
1948										**General Statistics**		
1949				Number of Valid Data	21					Number of Detected Data	19	
1950				Number of Distinct Detected Data	17					Number of Non-Detect Data	2	
1951										Percent Non-Detects	9.52%	
1952												
1953				**Raw Statistics**						**Log-transformed Statistics**		
1954				Minimum Detected	0.0053					Minimum Detected	-5.24	
1955				Maximum Detected	0.286					Maximum Detected	-1.252	
1956				Mean of Detected	0.0613					Mean of Detected	-3.493	
1957				SD of Detected	0.0706					SD of Detected	1.313	
1958				Minimum Non-Detect	0.0482					Minimum Non-Detect	-3.032	
1959				Maximum Non-Detect	0.168					Maximum Non-Detect	-1.784	
1960												
1961	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	20	

1962	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
1963	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	95.24%
1964												
1965	**UCL Statistics**											
1966	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
1967	Shapiro Wilk Test Statistic				0.766		Shapiro Wilk Test Statistic					0.876
1968	5% Shapiro Wilk Critical Value				0.901		5% Shapiro Wilk Critical Value					0.901
1969	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
1970												
1971	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
1972	DL/2 Substitution Method						DL/2 Substitution Method					
1973	Mean				0.0606		Mean					-3.456
1974	SD				0.0677		SD					1.266
1975	95% DL/2 (t) UCL				0.0861		95% H-Stat (DL/2) UCL					0.145
1976												
1977	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
1978	**MLE method failed to converge properly**						Mean in Log Scale					-3.546
1979							SD in Log Scale					1.263
1980							Mean in Original Scale					0.0572
1981							SD in Original Scale					0.0683
1982							95% Percentile Bootstrap UCL					0.0829
1983							95% BCA Bootstrap UCL					0.0903
1984												
1985	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
1986	k star (bias corrected)				0.744		**Data do not follow a Discernable Distribution (0.05)**					
1987	Theta Star				0.0823							
1988	nu star				28.27							
1989												
1990	A-D Test Statistic				0.899		**Nonparametric Statistics**					
1991	5% A-D Critical Value				0.775		Kaplan-Meier (KM) Method					
1992	K-S Test Statistic				0.775		Mean					0.0582
1993	5% K-S Critical Value				0.205		SD					0.0671
1994	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0152
1995							95% KM (t) UCL					0.0844
1996	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0832
1997	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0844
1998	Minimum				0.0053		95% KM (bootstrap t) UCL					0.0999
1999	Maximum				0.286		95% KM (BCA) UCL					0.0836
2000	Mean				0.0585		95% KM (Percentile Bootstrap) UCL					0.084
2001	Median				0.053		95% KM (Chebyshev) UCL					0.125
2002	SD				0.068		97.5% KM (Chebyshev) UCL					0.153
2003	k star				0.77		99% KM (Chebyshev) UCL					0.21
2004	Theta star				0.076							
2005	Nu star				32.33		**Potential UCLs to Use**					
2006	AppChi2				20.34		97.5% KM (Chebyshev) UCL					0.153
2007	95% Gamma Approximate UCL				0.093							
2008	95% Adjusted Gamma UCL				0.0964							
2009	**Note: DL/2 is not a recommended method.**											
2010												
2011												
2012	**Zinc, dissolved (mw-29)**											
2013												
2014	**General Statistics**											

2015					Number of Valid Data	22					Number of Detected Data	21
2016					Number of Distinct Detected Data	20					Number of Non-Detect Data	1
2017											Percent Non-Detects	4.55%
2018												
2019					**Raw Statistics**						**Log-transformed Statistics**	
2020					Minimum Detected	0.0049					Minimum Detected	-5.319
2021					Maximum Detected	0.356					Maximum Detected	-1.033
2022					Mean of Detected	0.077					Mean of Detected	-3.313
2023					SD of Detected	0.102					SD of Detected	1.291
2024					Minimum Non-Detect	0.0703					Minimum Non-Detect	-2.655
2025					Maximum Non-Detect	0.0703					Maximum Non-Detect	-2.655
2026												
2027												
2028					**UCL Statistics**							
2029					**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**	
2030					Shapiro Wilk Test Statistic	0.684					Shapiro Wilk Test Statistic	0.952
2031					5% Shapiro Wilk Critical Value	0.908					5% Shapiro Wilk Critical Value	0.908
2032					**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
2033												
2034					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
2035					DL/2 Substitution Method						DL/2 Substitution Method	
2036					Mean	0.0751					Mean	-3.314
2037					SD	0.0998					SD	1.26
2038					95% DL/2 (t) UCL	0.112					95% H-Stat (DL/2) UCL	0.162
2039												
2040					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
2041					**MLE yields a negative mean**						Mean in Log Scale	-3.34
2042											SD in Log Scale	1.267
2043											Mean in Original Scale	0.0744
2044											SD in Original Scale	0.1
2045											95% Percentile Bootstrap UCL	0.111
2046											95% BCA Bootstrap UCL	0.12
2047												
2048					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
2049					k star (bias corrected)	0.712					**Data appear Gamma Distributed at 5% Significance Level**	
2050					Theta Star	0.108						
2051					nu star	29.9						
2052												
2053					A-D Test Statistic	0.641					**Nonparametric Statistics**	
2054					5% A-D Critical Value	0.781					Kaplan-Meier (KM) Method	
2055					K-S Test Statistic	0.781					Mean	0.0746
2056					5% K-S Critical Value	0.197					SD	0.0979
2057					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0214
2058											95% KM (t) UCL	0.111
2059					**Assuming Gamma Distribution**						95% KM (z) UCL	0.11
2060					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.111
2061					Minimum	0.0049					95% KM (bootstrap t) UCL	0.153
2062					Maximum	0.356					95% KM (BCA) UCL	0.114
2063					Mean	0.0747					95% KM (Percentile Bootstrap) UCL	0.109
2064					Median	0.0364					95% KM (Chebyshev) UCL	0.168
2065					SD	0.1					97.5% KM (Chebyshev) UCL	0.208
2066					k star	0.729					99% KM (Chebyshev) UCL	0.288
2067					Theta star	0.102						

2068					Nu star	32.08	**Potential UCLs to Use**					
2069					AppChi2	20.13				95% KM (Chebyshev) UCL		0.168
2070					95% Gamma Approximate UCL	0.119						
2071					95% Adjusted Gamma UCL	0.123						
2072	**Note: DL/2 is not a recommended method.**											
2073												
2074												
2075	**Zinc, dissolved (mw-3)**											
2076												
2077					**General Statistics**							
2078					Number of Valid Data	5				Number of Detected Data		3
2079					Number of Distinct Detected Data	3				Number of Non-Detect Data		2
2080										Percent Non-Detects		40.00%
2081												
2082					**Raw Statistics**		**Log-transformed Statistics**					
2083					Minimum Detected	0.021				Minimum Detected		-3.863
2084					Maximum Detected	0.06				Maximum Detected		-2.813
2085					Mean of Detected	0.0362				Mean of Detected		-3.422
2086					SD of Detected	0.0209				SD of Detected		0.545
2087					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
2088					Maximum Non-Detect	0.01				Maximum Non-Detect		-4.605
2089												
2090	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		2
2091	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		3
2092	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		40.00%
2093												
2094	**Warning: There are only 3 Distinct Detected Values in this data set**											
2095	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
2096	**Those methods will return a 'N/A' value on your output display!**											
2097												
2098	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
2099	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
2100												
2101												
2102					**UCL Statistics**							
2103					**Normal Distribution Test with Detected Values Only**		**Lognormal Distribution Test with Detected Values Only**					
2104					Shapiro Wilk Test Statistic	0.873				Shapiro Wilk Test Statistic		0.929
2105					5% Shapiro Wilk Critical Value	0.767				5% Shapiro Wilk Critical Value		0.767
2106					**Data appear Normal at 5% Significance Level**		**Data appear Lognormal at 5% Significance Level**					
2107												
2108					**Assuming Normal Distribution**		**Assuming Lognormal Distribution**					
2109					DL/2 Substitution Method					DL/2 Substitution Method		
2110					Mean	0.0232				Mean		-4.311
2111					SD	0.0231				SD		1.3
2112					95% DL/2 (t) UCL	0.0453				95% H-Stat (DL/2) UCL		0.312
2113												
2114					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
2115					Mean	0.0179				Mean in Log Scale		-4.079
2116					SD	0.0277				SD in Log Scale		0.978
2117					95% MLE (t) UCL	0.0444				Mean in Original Scale		0.0242
2118					95% MLE (Tiku) UCL	0.0478				SD in Original Scale		0.022
2119										95% Percentile Bootstrap UCL		0.0406
2120										95% BCA Bootstrap UCL		0.0415

2121												
2122	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2123					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
2124					Theta Star	N/A						
2125					nu star	N/A						
2126												
2127					A-D Test Statistic	0.374	**Nonparametric Statistics**					
2128					5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method					
2129					K-S Test Statistic	N/A	Mean	0.0301				
2130					5% K-S Critical Value	N/A	SD	0.0152				
2131	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0083				
2132							95% KM (t) UCL	0.0478				
2133	**Assuming Gamma Distribution**						95% KM (z) UCL	0.0438				
2134					Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.0461				
2135					Minimum	N/A	95% KM (bootstrap t) UCL	0.0776				
2136					Maximum	N/A	95% KM (BCA) UCL	0.06				
2137					Mean	N/A	95% KM (Percentile Bootstrap) UCL	0.06				
2138					Median	N/A	95% KM (Chebyshev) UCL	0.0663				
2139					SD	N/A	97.5% KM (Chebyshev) UCL	0.082				
2140					k star	N/A	99% KM (Chebyshev) UCL	0.113				
2141					Theta star	N/A						
2142					Nu star	N/A	**Potential UCLs to Use**					
2143					AppChi2	N/A	95% KM (t) UCL	0.0478				
2144					95% Gamma Approximate UCL	N/A	95% KM (Percentile Bootstrap) UCL	0.06				
2145					95% Adjusted Gamma UCL	N/A						
2146	**Note: DL/2 is not a recommended method.**											
2147												
2148												
2149	**Zinc, dissolved (mw-30-30)**											
2150												
2151	**General Statistics**											
2152					Number of Valid Data	22	Number of Detected Data	18				
2153					Number of Distinct Detected Data	15	Number of Non-Detect Data	4				
2154							Percent Non-Detects	18.18%				
2155												
2156	**Raw Statistics**						**Log-transformed Statistics**					
2157					Minimum Detected	0.008	Minimum Detected	-4.828				
2158					Maximum Detected	0.597	Maximum Detected	-0.516				
2159					Mean of Detected	0.0749	Mean of Detected	-3.34				
2160					SD of Detected	0.135	SD of Detected	1.159				
2161					Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298				
2162					Maximum Non-Detect	0.0428	Maximum Non-Detect	-3.151				
2163												
2164	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	14				
2165	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	8				
2166	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	63.64%				
2167												
2168	**UCL Statistics**											
2169	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2170					Shapiro Wilk Test Statistic	0.478	Shapiro Wilk Test Statistic	0.923				
2171					5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897				
2172	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2173												

2174	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2175				DL/2 Substitution Method						DL/2 Substitution Method		
2176				Mean		0.0637				Mean		-3.567
2177				SD		0.124				SD		1.213
2178				95% DL/2 (t) UCL		0.109				95% H-Stat (DL/2) UCL		0.0868
2179												
2180				Maximum Likelihood Estimate(MLE) Method		N/A				Log ROS Method		
2181				**MLE yields a negative mean**						Mean in Log Scale		-3.602
2182										SD in Log Scale		1.236
2183										Mean in Original Scale		0.0631
2184										SD in Original Scale		0.124
2185										95% Percentile Bootstrap UCL		0.112
2186										95% BCA Bootstrap UCL		0.141
2187												
2188	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2189				k star (bias corrected)		0.699	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
2190				Theta Star		0.107						
2191				nu star		25.17						
2192												
2193				A-D Test Statistic		0.971	**Nonparametric Statistics**					
2194				5% A-D Critical Value		0.776				Kaplan-Meier (KM) Method		
2195				K-S Test Statistic		0.776				Mean		0.0635
2196				5% K-S Critical Value		0.211				SD		0.121
2197	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean		0.0266
2198										95% KM (t) UCL		0.109
2199	**Assuming Gamma Distribution**									95% KM (z) UCL		0.107
2200				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.109
2201				Minimum		1E-09				95% KM (bootstrap t) UCL		0.199
2202				Maximum		0.597				95% KM (BCA) UCL		0.116
2203				Mean		0.0645				95% KM (Percentile Bootstrap) UCL		0.111
2204				Median		0.0274				95% KM (Chebyshev) UCL		0.179
2205				SD		0.124				97.5% KM (Chebyshev) UCL		0.23
2206				k star		0.416				99% KM (Chebyshev) UCL		0.328
2207				Theta star		0.155						
2208				Nu star		18.28	**Potential UCLs to Use**					
2209				AppChi2		9.597				95% KM (Chebyshev) UCL		0.179
2210				95% Gamma Approximate UCL		0.123						
2211				95% Adjusted Gamma UCL		0.129						
2212	**Note: DL/2 is not a recommended method.**											
2213												
2214												
2215	**Zinc, dissolved (mw-30-50)**											
2216												
2217							**General Statistics**					
2218				Number of Valid Data		6				Number of Detected Data		5
2219				Number of Distinct Detected Data		5				Number of Non-Detect Data		1
2220										Percent Non-Detects		16.67%
2221												
2222				**Raw Statistics**						**Log-transformed Statistics**		
2223				Minimum Detected		0.0467				Minimum Detected		-3.064
2224				Maximum Detected		0.365				Maximum Detected		-1.008
2225				Mean of Detected		0.15				Mean of Detected		-2.141
2226				SD of Detected		0.125				SD of Detected		0.754

2227				Minimum Non-Detect	0.0626					Minimum Non-Detect	-2.771	
2228				Maximum Non-Detect	0.0626					Maximum Non-Detect	-2.771	
2229												
2230												
2231					**Warning: There are only 5 Detected Values in this data**							
2232					**Note: It should be noted that even though bootstrap may be performed on this data set**							
2233					**the resulting calculations may not be reliable enough tp draw conclusions**							
2234												
2235					**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**							
2236												
2237												
2238					**UCL Statistics**							
2239				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
2240				Shapiro Wilk Test Statistic	0.802					Shapiro Wilk Test Statistic	0.961	
2241				5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762	
2242				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
2243												
2244				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
2245				DL/2 Substitution Method						DL/2 Substitution Method		
2246				Mean	0.13					Mean	-2.361	
2247				SD	0.122					SD	0.864	
2248				95% DL/2 (t) UCL	0.23					95% H-Stat (DL/2) UCL	0.196	
2249												
2250				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
2251				Mean	0.104					Mean in Log Scale	-2.318	
2252				SD	0.143					SD in Log Scale	0.803	
2253				95% MLE (t) UCL	0.222					Mean in Original Scale	0.131	
2254				95% MLE (Tiku) UCL	0.23					SD in Original Scale	0.121	
2255										95% Percentile Bootstrap UCL	0.221	
2256										95% BCA Bootstrap UCL	0.239	
2257												
2258				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
2259				k star (bias corrected)	1.025					**Data appear Normal at 5% Significance Level**		
2260				Theta Star	0.146							
2261				nu star	10.25							
2262												
2263				A-D Test Statistic	0.353					**Nonparametric Statistics**		
2264				5% A-D Critical Value	0.684					Kaplan-Meier (KM) Method		
2265				K-S Test Statistic	0.684					Mean	0.132	
2266				5% K-S Critical Value	0.36					SD	0.109	
2267				**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0499	
2268										95% KM (t) UCL	0.233	
2269				**Assuming Gamma Distribution**						95% KM (z) UCL	0.215	
2270				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.23	
2271				Minimum	0.0445					95% KM (bootstrap t) UCL	0.401	
2272				Maximum	0.365					95% KM (BCA) UCL	0.231	
2273				Mean	0.132					95% KM (Percentile Bootstrap) UCL	0.228	
2274				Median	0.0951					95% KM (Chebyshev) UCL	0.35	
2275				SD	0.12					97.5% KM (Chebyshev) UCL	0.444	
2276				k star	1.085					99% KM (Chebyshev) UCL	0.629	
2277				Theta star	0.122							
2278				Nu star	13.02					**Potential UCLs to Use**		
2279				AppChi2	5.907					95% KM (t) UCL	0.233	

2280				95% Gamma Approximate UCL		0.291				95% KM (Percentile Bootstrap) UCL		0.228
2281				95% Adjusted Gamma UCL		0.4						
2282	**Note: DL/2 is not a recommended method.**											
2283												
2284												
2285	**Zinc, dissolved (mw-31-135)**											
2286												
2287	**General Statistics**											
2288				Number of Valid Data		1				Number of Detected Data		0
2289				Number of Distinct Detected Data		0				Number of Non-Detect Data		1
2290										Percent Non-Detects		100.00%
2291												
2292	**Warning: This data set only has 1 observations!**											
2293	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2294	**The data set for variable Zinc, dissolved (mw-31-135) was not processed!**											
2295												
2296	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2297	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2298												
2299												
2300												
2301	**Zinc, dissolved (mw-31-60)**											
2302												
2303	**General Statistics**											
2304				Number of Valid Data		23				Number of Detected Data		21
2305				Number of Distinct Detected Data		19				Number of Non-Detect Data		2
2306										Percent Non-Detects		8.70%
2307												
2308	**Raw Statistics**						**Log-transformed Statistics**					
2309				Minimum Detected		0.0073				Minimum Detected		-4.92
2310				Maximum Detected		0.274				Maximum Detected		-1.295
2311				Mean of Detected		0.0807				Mean of Detected		-3.057
2312				SD of Detected		0.0848				SD of Detected		1.09
2313				Minimum Non-Detect		0.02				Minimum Non-Detect		-3.912
2314				Maximum Non-Detect		0.0635				Maximum Non-Detect		-2.757
2315												
2316	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		15
2317	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		8
2318	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		65.22%
2319												
2320	**UCL Statistics**											
2321	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2322				Shapiro Wilk Test Statistic		0.787				Shapiro Wilk Test Statistic		0.951
2323				5% Shapiro Wilk Critical Value		0.908				5% Shapiro Wilk Critical Value		0.908
2324	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2325												
2326	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2327				DL/2 Substitution Method						DL/2 Substitution Method		
2328				Mean		0.0755				Mean		-3.141
2329				SD		0.0828				SD		1.091
2330				95% DL/2 (t) UCL		0.105				95% H-Stat (DL/2) UCL		0.117
2331												
2332				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		

2333					Mean	0.00884					Mean in Log Scale	-3.15
2334					SD	0.148					SD in Log Scale	1.092
2335					95% MLE (t) UCL	0.062					Mean in Original Scale	0.0752
2336					95% MLE (Tiku) UCL	0.0911					SD in Original Scale	0.0829
2337											95% Percentile Bootstrap UCL	0.104
2338											95% BCA Bootstrap UCL	0.108
2339												
2340	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2341					k star (bias corrected)	0.942	**Data Follow Appr. Gamma Distribution at 5% Significance Level**					
2342					Theta Star	0.0856						
2343					nu star	39.57						
2344												
2345					A-D Test Statistic	0.746	**Nonparametric Statistics**					
2346					5% A-D Critical Value	0.768	Kaplan-Meier (KM) Method					
2347					K-S Test Statistic	0.768	Mean	0.0752				
2348					5% K-S Critical Value	0.195	SD	0.0811				
2349	**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean	0.0173				
2350							95% KM (t) UCL	0.105				
2351	**Assuming Gamma Distribution**						95% KM (z) UCL	0.104				
2352					Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.105				
2353					Minimum	1E-09	95% KM (bootstrap t) UCL	0.115				
2354					Maximum	0.274	95% KM (BCA) UCL	0.106				
2355					Mean	0.0755	95% KM (Percentile Bootstrap) UCL	0.104				
2356					Median	0.036	95% KM (Chebyshev) UCL	0.151				
2357					SD	0.0829	97.5% KM (Chebyshev) UCL	0.184				
2358					k star	0.471	99% KM (Chebyshev) UCL	0.248				
2359					Theta star	0.16						
2360					Nu star	21.67	**Potential UCLs to Use**					
2361					AppChi2	12.09	95% KM (Chebyshev) UCL	0.151				
2362					95% Gamma Approximate UCL	0.135						
2363					95% Adjusted Gamma UCL	0.141						
2364	**Note: DL/2 is not a recommended method.**											
2365												
2366												
2367	**Zinc, dissolved (mw-32-20)**											
2368												
2369	**General Statistics**											
2370					Number of Valid Data	6	Number of Detected Data	5				
2371					Number of Distinct Detected Data	5	Number of Non-Detect Data	1				
2372							Percent Non-Detects	16.67%				
2373												
2374	**Raw Statistics**						**Log-transformed Statistics**					
2375					Minimum Detected	0.0359	Minimum Detected	-3.327				
2376					Maximum Detected	0.0857	Maximum Detected	-2.457				
2377					Mean of Detected	0.0705	Mean of Detected	-2.699				
2378					SD of Detected	0.0209	SD of Detected	0.367				
2379					Minimum Non-Detect	0.052	Minimum Non-Detect	-2.957				
2380					Maximum Non-Detect	0.052	Maximum Non-Detect	-2.957				
2381												
2382												
2383	**Warning: There are only 5 Detected Values in this data**											
2384	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2385	**the resulting calculations may not be reliable enough tp draw conclusions**											

	A	B	C	D	E	F	G	H	I	J	K	L
2386												
2387	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2388												
2389												
2390	**UCL Statistics**											
2391	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2392	Shapiro Wilk Test Statistic					0.809	Shapiro Wilk Test Statistic					0.757
2393	5% Shapiro Wilk Critical Value					0.762	5% Shapiro Wilk Critical Value					0.762
2394	**Data appear Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
2395												
2396	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2397	DL/2 Substitution Method						DL/2 Substitution Method					
2398	Mean					0.0631	Mean					-2.857
2399	SD					0.0261	SD					0.508
2400	95% DL/2 (t) UCL					0.0845	95% H-Stat (DL/2) UCL					0.0871
2401												
2402	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
2403	Mean					0.0792	Mean in Log Scale					-2.782
2404	SD					0.00788	SD in Log Scale					0.386
2405	95% MLE (t) UCL					0.0856	Mean in Original Scale					0.0655
2406	95% MLE (Tiku) UCL					0.0871	SD in Original Scale					0.0223
2407							95% Percentile Bootstrap UCL					0.0785
2408							95% BCA Bootstrap UCL					0.077
2409												
2410	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2411	k star (bias corrected)					4.486	**Data appear Normal at 5% Significance Level**					
2412	Theta Star					0.0157						
2413	nu star					44.86						
2414												
2415	A-D Test Statistic					0.654	**Nonparametric Statistics**					
2416	5% A-D Critical Value					0.679	Kaplan-Meier (KM) Method					
2417	K-S Test Statistic					0.679	Mean					0.0647
2418	5% K-S Critical Value					0.358	SD					0.0214
2419	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00976
2420							95% KM (t) UCL					0.0844
2421	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0808
2422	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0863
2423	Minimum					0.0359	95% KM (bootstrap t) UCL					0.0782
2424	Maximum					0.0857	95% KM (BCA) UCL					0.0838
2425	Mean					0.0674	95% KM (Percentile Bootstrap) UCL					0.0825
2426	Median					0.0733	95% KM (Chebyshev) UCL					0.107
2427	SD					0.0202	97.5% KM (Chebyshev) UCL					0.126
2428	k star					5.761	99% KM (Chebyshev) UCL					0.162
2429	Theta star					0.0117						
2430	Nu star					69.14	**Potential UCLs to Use**					
2431	AppChi2					51	95% KM (t) UCL					0.0844
2432	95% Gamma Approximate UCL					0.0914	95% KM (Percentile Bootstrap) UCL					0.0825
2433	95% Adjusted Gamma UCL					0.103						
2434	**Note: DL/2 is not a recommended method.**											
2435												
2436												
2437	**Zinc, dissolved (mw-32-35)**											
2438												

	A	B	C	D	E	F	G	H	I	J	K	L
2439	**General Statistics**											
2440					Number of Valid Data	9				Number of Detected Data		5
2441					Number of Distinct Detected Data	5				Number of Non-Detect Data		4
2442										Percent Non-Detects		44.44%
2443												
2444	**Raw Statistics**						**Log-transformed Statistics**					
2445					Minimum Detected	0.0398				Minimum Detected		-3.224
2446					Maximum Detected	0.381				Maximum Detected		-0.965
2447					Mean of Detected	0.223				Mean of Detected		-1.834
2448					SD of Detected	0.157				SD of Detected		1.033
2449					Minimum Non-Detect	0.02				Minimum Non-Detect		-3.912
2450					Maximum Non-Detect	0.2				Maximum Non-Detect		-1.609
2451												
2452	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		6
2453	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		3
2454	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		66.67%
2455												
2456	**Warning: There are only 5 Detected Values in this data**											
2457	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2458	**the resulting calculations may not be reliable enough tp draw conclusions**											
2459												
2460	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2461												
2462												
2463	**UCL Statistics**											
2464	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2465					Shapiro Wilk Test Statistic	0.849				Shapiro Wilk Test Statistic		0.823
2466					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
2467	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2468												
2469	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2470					DL/2 Substitution Method					DL/2 Substitution Method		
2471					Mean	0.139				Mean		-2.779
2472					SD	0.152				SD		1.502
2473					95% DL/2 (t) UCL	0.233				95% H-Stat (DL/2) UCL		1.446
2474												
2475					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
2476					Mean	0.336				Mean in Log Scale		-2.874
2477					SD	0.0346				SD in Log Scale		1.465
2478					95% MLE (t) UCL	0.357				Mean in Original Scale		0.132
2479					95% MLE (Tiku) UCL	0.373				SD in Original Scale		0.156
2480										95% Percentile Bootstrap UCL		0.21
2481										95% BCA Bootstrap UCL		0.233
2482												
2483	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2484					k star (bias corrected)	0.789	**Data appear Normal at 5% Significance Level**					
2485					Theta Star	0.283						
2486					nu star	7.891						
2487												
2488					A-D Test Statistic	0.569	**Nonparametric Statistics**					
2489					5% A-D Critical Value	0.686				Kaplan-Meier (KM) Method		
2490					K-S Test Statistic	0.686				Mean		0.143
2491					5% K-S Critical Value	0.361				SD		0.138

2492	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.0516
2493											95% KM (t) UCL	0.238
2494	Assuming Gamma Distribution										95% KM (z) UCL	0.227
2495	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.23
2496	Minimum	0.0398									95% KM (bootstrap t) UCL	0.238
2497	Maximum	0.381									95% KM (BCA) UCL	0.335
2498	Mean	0.194									95% KM (Percentile Bootstrap) UCL	0.316
2499	Median	0.175									95% KM (Chebyshev) UCL	0.367
2500	SD	0.12									97.5% KM (Chebyshev) UCL	0.465
2501	k star	1.715									99% KM (Chebyshev) UCL	0.656
2502	Theta star	0.113										
2503	Nu star	30.87									Potential UCLs to Use	
2504	AppChi2	19.18									95% KM (t) UCL	0.238
2505	95% Gamma Approximate UCL	0.313									95% KM (Percentile Bootstrap) UCL	0.316
2506	95% Adjusted Gamma UCL	0.348										
2507	Note: DL/2 is not a recommended method.											
2508												
2509												
2510	Zinc, dissolved (mw-33-210)											
2511												
2512	General Statistics											
2513	Number of Valid Data	1									Number of Detected Data	0
2514	Number of Distinct Detected Data	0									Number of Non-Detect Data	1
2515											Percent Non-Detects	100.00%
2516												
2517	Warning: This data set only has 1 observations!											
2518	Data set is too small to compute reliable and meaningful statistics and estimates!											
2519	The data set for variable Zinc, dissolved (mw-33-210) was not processed!											
2520												
2521	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2522	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2523												
2524												
2525												
2526	Zinc, dissolved (mw-33-40)											
2527												
2528	General Statistics											
2529	Number of Valid Data	6									Number of Detected Data	4
2530	Number of Distinct Detected Data	4									Number of Non-Detect Data	2
2531											Percent Non-Detects	33.33%
2532												
2533	Raw Statistics										Log-transformed Statistics	
2534	Minimum Detected	0.0331									Minimum Detected	-3.408
2535	Maximum Detected	0.171									Maximum Detected	-1.766
2536	Mean of Detected	0.0835									Mean of Detected	-2.7
2537	SD of Detected	0.0635									SD of Detected	0.757
2538	Minimum Non-Detect	0.0261									Minimum Non-Detect	-3.646
2539	Maximum Non-Detect	0.0527									Maximum Non-Detect	-2.943
2540												
2541	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	4
2542	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
2543	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	66.67%
2544												

	A	B	C	D	E	F	G	H	I	J	K	L
2545	**Warning: There are only 4 Distinct Detected Values in this data**											
2546	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2547	**the resulting calculations may not be reliable enough tp draw conclusions**											
2548												
2549	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2550												
2551												
2552	**UCL Statistics**											
2553	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2554	Shapiro Wilk Test Statistic					0.877	Shapiro Wilk Test Statistic					0.927
2555	5% Shapiro Wilk Critical Value					0.748	5% Shapiro Wilk Critical Value					0.748
2556	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2557												
2558	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2559	DL/2 Substitution Method						DL/2 Substitution Method					
2560	Mean					0.0622	Mean					-3.129
2561	SD					0.0594	SD					0.914
2562	95% DL/2 (t) UCL					0.111	95% H-Stat (DL/2) UCL					0.121
2563												
2564	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2565	**MLE method failed to converge properly**						Mean in Log Scale					-3.148
2566							SD in Log Scale					0.947
2567							Mean in Original Scale					0.062
2568							SD in Original Scale					0.0596
2569							95% Percentile Bootstrap UCL					0.102
2570							95% BCA Bootstrap UCL					0.113
2571												
2572	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2573	k star (bias corrected)					0.781	**Data appear Normal at 5% Significance Level**					
2574	Theta Star					0.107						
2575	nu star					6.251						
2576												
2577	A-D Test Statistic					0.334	**Nonparametric Statistics**					
2578	5% A-D Critical Value					0.66	Kaplan-Meier (KM) Method					
2579	K-S Test Statistic					0.66	Mean					0.0671
2580	5% K-S Critical Value					0.397	SD					0.0506
2581	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0239
2582							95% KM (t) UCL					0.115
2583	**Assuming Gamma Distribution**						95% KM (z) UCL					0.106
2584	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.112
2585	Minimum					0.0331	95% KM (bootstrap t) UCL					0.126
2586	Maximum					0.171	95% KM (BCA) UCL					0.117
2587	Mean					0.0792	95% KM (Percentile Bootstrap) UCL					0.117
2588	Median					0.0706	95% KM (Chebyshev) UCL					0.171
2589	SD					0.0502	97.5% KM (Chebyshev) UCL					0.216
2590	k star					1.832	99% KM (Chebyshev) UCL					0.304
2591	Theta star					0.0432						
2592	Nu star					21.99	**Potential UCLs to Use**					
2593	AppChi2					12.33	95% KM (t) UCL					0.115
2594	95% Gamma Approximate UCL					0.141	95% KM (Percentile Bootstrap) UCL					0.117
2595	95% Adjusted Gamma UCL					N/A						
2596	**Note: DL/2 is not a recommended method.**											
2597												

	A	B	C	D	E	F	G	H	I	J	K	L
2598												
2599	**Zinc, dissolved (mw-33-90)**											
2600												
2601	**General Statistics**											
2602	Number of Valid Data					6	Number of Detected Data					5
2603	Number of Distinct Detected Data					5	Number of Non-Detect Data					1
2604							Percent Non-Detects					16.67%
2605												
2606	**Raw Statistics**						**Log-transformed Statistics**					
2607	Minimum Detected					0.017	Minimum Detected					-4.075
2608	Maximum Detected					0.315	Maximum Detected					-1.155
2609	Mean of Detected					0.134	Mean of Detected					-2.376
2610	SD of Detected					0.112	SD of Detected					1.081
2611	Minimum Non-Detect					0.0422	Minimum Non-Detect					-3.165
2612	Maximum Non-Detect					0.0422	Maximum Non-Detect					-3.165
2613												
2614												
2615	**Warning: There are only 5 Detected Values in this data**											
2616	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2617	**the resulting calculations may not be reliable enough tp draw conclusions**											
2618												
2619	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2620												
2621												
2622	**UCL Statistics**											
2623	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2624	Shapiro Wilk Test Statistic					0.922	Shapiro Wilk Test Statistic					0.945
2625	5% Shapiro Wilk Critical Value					0.762	5% Shapiro Wilk Critical Value					0.762
2626	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2627												
2628	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2629	DL/2 Substitution Method						DL/2 Substitution Method					
2630	Mean					0.115	Mean					-2.623
2631	SD					0.111	SD					1.141
2632	95% DL/2 (t) UCL					0.206	95% H-Stat (DL/2) UCL					0.432
2633												
2634	Maximum Likelihood Estimate(MLE) Method						Log ROS Method					
2635	Mean					0.0943	Mean in Log Scale					-2.64
2636	SD					0.129	SD in Log Scale					1.163
2637	95% MLE (t) UCL					0.201	Mean in Original Scale					0.115
2638	95% MLE (Tiku) UCL					0.209	SD in Original Scale					0.111
2639							95% Percentile Bootstrap UCL					0.192
2640							95% BCA Bootstrap UCL					0.202
2641												
2642	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2643	k star (bias corrected)					0.735	**Data appear Normal at 5% Significance Level**					
2644	Theta Star					0.182						
2645	nu star					7.352						
2646												
2647	A-D Test Statistic					0.203	**Nonparametric Statistics**					
2648	5% A-D Critical Value					0.686	Kaplan-Meier (KM) Method					
2649	K-S Test Statistic					0.686	Mean					0.115
2650	5% K-S Critical Value					0.362	SD					0.102

	A	B	C	D	E	F	G	H	I	J	K	L
2651	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0464
2652											95% KM (t) UCL	0.208
2653	**Assuming Gamma Distribution**										95% KM (z) UCL	0.191
2654	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.206
2655					Minimum	0.017					95% KM (bootstrap t) UCL	0.243
2656					Maximum	0.315					95% KM (BCA) UCL	0.208
2657					Mean	0.117					95% KM (Percentile Bootstrap) UCL	0.198
2658					Median	0.0945					95% KM (Chebyshev) UCL	0.317
2659					SD	0.109					97.5% KM (Chebyshev) UCL	0.404
2660					k star	0.794					99% KM (Chebyshev) UCL	0.576
2661					Theta star	0.148						
2662					Nu star	9.531	**Potential UCLs to Use**					
2663					AppChi2	3.651					95% KM (t) UCL	0.208
2664					95% Gamma Approximate UCL	0.306					95% KM (Percentile Bootstrap) UCL	0.198
2665					95% Adjusted Gamma UCL	0.453						
2666	**Note: DL/2 is not a recommended method.**											
2667												
2668												
2669	**Zinc, dissolved (mw-34-100)**											
2670												
2671	**General Statistics**											
2672					Number of Valid Observations	2					Number of Distinct Observations	2
2673												
2674												
2675	**Warning: This data set only has 2 observations!**											
2676	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
2677	**The data set for variable Zinc, dissolved (mw-34-100) was not processed!**											
2678												
2679	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
2680	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
2681												
2682												
2683												
2684	**Zinc, dissolved (mw-34-55)**											
2685												
2686	**General Statistics**											
2687					Number of Valid Data	14					Number of Detected Data	9
2688					Number of Distinct Detected Data	8					Number of Non-Detect Data	5
2689											Percent Non-Detects	35.71%
2690												
2691	**Raw Statistics**						**Log-transformed Statistics**					
2692					Minimum Detected	0.0141					Minimum Detected	-4.262
2693					Maximum Detected	0.163					Maximum Detected	-1.814
2694					Mean of Detected	0.0536					Mean of Detected	-3.222
2695					SD of Detected	0.048					SD of Detected	0.786
2696					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
2697					Maximum Non-Detect	0.0831					Maximum Non-Detect	-2.488
2698												
2699	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	12
2700	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	2
2701	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	85.71%
2702												
2703	**Warning: There are only 9 Detected Values in this data**											

	A	B	C	D	E	F	G	H	I	J	K	L
2704	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2705	**the resulting calculations may not be reliable enough tp draw conclusions**											
2706												
2707	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2708												
2709												
2710	**UCL Statistics**											
2711	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2712	Shapiro Wilk Test Statistic					0.783	Shapiro Wilk Test Statistic					0.938
2713	5% Shapiro Wilk Critical Value					0.829	5% Shapiro Wilk Critical Value					0.829
2714	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2715												
2716	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2717	DL/2 Substitution Method						DL/2 Substitution Method					
2718	Mean					0.0392	Mean					-3.763
2719	SD					0.0436	SD					1.099
2720	95% DL/2 (t) UCL					0.0598	95% H-Stat (DL/2) UCL					0.078
2721												
2722	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
2723	**MLE method failed to converge properly**						Mean in Log Scale					-3.785
2724							SD in Log Scale					1.041
2725							Mean in Original Scale					0.0378
2726							SD in Original Scale					0.0437
2727							95% Percentile Bootstrap UCL					0.0578
2728							95% BCA Bootstrap UCL					0.0646
2729												
2730	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2731	k star (bias corrected)					1.302	**Data appear Gamma Distributed at 5% Significance Level**					
2732	Theta Star					0.0412						
2733	nu star					23.44						
2734												
2735	A-D Test Statistic					0.492	**Nonparametric Statistics**					
2736	5% A-D Critical Value					0.731	Kaplan-Meier (KM) Method					
2737	K-S Test Statistic					0.731	Mean					0.0404
2738	5% K-S Critical Value					0.283	SD					0.0408
2739	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0116
2740							95% KM (t) UCL					0.061
2741	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0595
2742	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0593
2743	Minimum					1E-09	95% KM (bootstrap t) UCL					0.0764
2744	Maximum					0.163	95% KM (BCA) UCL					0.0624
2745	Mean					0.0442	95% KM (Percentile Bootstrap) UCL					0.0612
2746	Median					0.0272	95% KM (Chebyshev) UCL					0.0911
2747	SD					0.0424	97.5% KM (Chebyshev) UCL					0.113
2748	k star					0.399	99% KM (Chebyshev) UCL					0.156
2749	Theta star					0.111						
2750	Nu star					11.17	**Potential UCLs to Use**					
2751	AppChi2					4.683	95% KM (Percentile Bootstrap) UCL					0.0612
2752	95% Gamma Approximate UCL					0.105						
2753	95% Adjusted Gamma UCL					0.119						
2754	**Note: DL/2 is not a recommended method.**											
2755												
2756												

2757	**Zinc, dissolved (mw-34-80)**											
2758												
2759	**General Statistics**											
2760					Number of Valid Data	18			Number of Detected Data	9		
2761					Number of Distinct Detected Data	9			Number of Non-Detect Data	9		
2762									Percent Non-Detects	50.00%		
2763												
2764	**Raw Statistics**						**Log-transformed Statistics**					
2765					Minimum Detected	0.0232			Minimum Detected	-3.764		
2766					Maximum Detected	0.0854			Maximum Detected	-2.46		
2767					Mean of Detected	0.0479			Mean of Detected	-3.139		
2768					SD of Detected	0.0234			SD of Detected	0.469		
2769					Minimum Non-Detect	0.01			Minimum Non-Detect	-4.605		
2770					Maximum Non-Detect	0.0755			Maximum Non-Detect	-2.584		
2771												
2772	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	16		
2773	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	2		
2774	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	88.89%		
2775												
2776	**Warning: There are only 9 Detected Values in this data**											
2777	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2778	**the resulting calculations may not be reliable enough tp draw conclusions**											
2779												
2780	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2781												
2782												
2783	**UCL Statistics**											
2784	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2785					Shapiro Wilk Test Statistic	0.843			Shapiro Wilk Test Statistic	0.902		
2786					5% Shapiro Wilk Critical Value	0.829			5% Shapiro Wilk Critical Value	0.829		
2787	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2788												
2789	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2790					DL/2 Substitution Method				DL/2 Substitution Method			
2791					Mean	0.0288			Mean	-4.029		
2792					SD	0.0264			SD	1.079		
2793					95% DL/2 (t) UCL	0.0397			95% H-Stat (DL/2) UCL	0.0461		
2794												
2795					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
2796	**MLE method failed to converge properly**								Mean in Log Scale	-3.707		
2797									SD in Log Scale	0.708		
2798									Mean in Original Scale	0.0313		
2799									SD in Original Scale	0.0237		
2800									95% Percentile Bootstrap UCL	0.0407		
2801									95% BCA Bootstrap UCL	0.0416		
2802												
2803	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2804					k star (bias corrected)	3.487	**Data appear Normal at 5% Significance Level**					
2805					Theta Star	0.0137						
2806					nu star	62.77						
2807												
2808					A-D Test Statistic	0.571	**Nonparametric Statistics**					
2809					5% A-D Critical Value	0.723			Kaplan-Meier (KM) Method			

2810					K-S Test Statistic	0.723					Mean	0.0359
2811					5% K-S Critical Value	0.28					SD	0.0199
2812					**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.00504
2813											95% KM (t) UCL	0.0447
2814					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0442
2815					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0436
2816					Minimum	0.0232					95% KM (bootstrap t) UCL	0.0466
2817					Maximum	0.0854					95% KM (BCA) UCL	0.0492
2818					Mean	0.0476					95% KM (Percentile Bootstrap) UCL	0.0465
2819					Median	0.0428					95% KM (Chebyshev) UCL	0.0579
2820					SD	0.0182					97.5% KM (Chebyshev) UCL	0.0674
2821					k star	6.31					99% KM (Chebyshev) UCL	0.0861
2822					Theta star	0.00755						
2823					Nu star	227.2					**Potential UCLs to Use**	
2824					AppChi2	193.3					95% KM (t) UCL	0.0447
2825					95% Gamma Approximate UCL	0.056					95% KM (Percentile Bootstrap) UCL	0.0465
2826					95% Adjusted Gamma UCL	0.0569						
2827	**Note: DL/2 is not a recommended method.**											
2828												
2829												
2830	**Zinc, dissolved (mw-35-135)**											
2831												
2832					**General Statistics**							
2833					Number of Valid Data	2					Number of Detected Data	1
2834					Number of Distinct Detected Data	1					Number of Non-Detect Data	1
2835											Percent Non-Detects	50.00%
2836												
2837					**Warning: This data set only has 2 observations!**							
2838					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
2839					**The data set for variable Zinc, dissolved (mw-35-135) was not processed!**							
2840												
2841					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
2842					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
2843												
2844												
2845												
2846	**Zinc, dissolved (mw-35-60)**											
2847												
2848					**General Statistics**							
2849					Number of Valid Observations	1					Number of Distinct Observations	1
2850												
2851												
2852					**Warning: This data set only has 1 observations!**							
2853					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
2854					**The data set for variable Zinc, dissolved (mw-35-60) was not processed!**							
2855												
2856					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
2857					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
2858												
2859												
2860												
2861	**Zinc, dissolved (mw-37d)**											
2862												

	A	B	C	D	E	F	G	H	I	J	K	L
2863	**General Statistics**											
2864					Number of Valid Data	13				Number of Detected Data		5
2865					Number of Distinct Detected Data	5				Number of Non-Detect Data		8
2866										Percent Non-Detects		61.54%
2867												
2868	**Raw Statistics**						**Log-transformed Statistics**					
2869					Minimum Detected	0.011				Minimum Detected		-4.51
2870					Maximum Detected	0.0918				Maximum Detected		-2.388
2871					Mean of Detected	0.0386				Mean of Detected		-3.495
2872					SD of Detected	0.0313				SD of Detected		0.77
2873					Minimum Non-Detect	0.01				Minimum Non-Detect		-4.605
2874					Maximum Non-Detect	0.02				Maximum Non-Detect		-3.912
2875												
2876	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		9
2877	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		4
2878	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		69.23%
2879												
2880	**Warning: There are only 5 Detected Values in this data**											
2881	**Note: It should be noted that even though bootstrap may be performed on this data set**											
2882	**the resulting calculations may not be reliable enough tp draw conclusions**											
2883												
2884	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
2885												
2886												
2887	**UCL Statistics**											
2888	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
2889					Shapiro Wilk Test Statistic	0.829				Shapiro Wilk Test Statistic		0.971
2890					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
2891	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
2892												
2893	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
2894					DL/2 Substitution Method					DL/2 Substitution Method		
2895					Mean	0.0187				Mean		-4.498
2896					SD	0.0245				SD		0.969
2897					95% DL/2 (t) UCL	0.0308				95% H-Stat (DL/2) UCL		0.0209
2898												
2899					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
2900	**MLE yields a negative mean**									Mean in Log Scale		-5.033
2901										SD in Log Scale		1.474
2902										Mean in Original Scale		0.0168
2903										SD in Original Scale		0.0255
2904										95% Percentile Bootstrap UCL		0.0296
2905										95% BCA Bootstrap UCL		0.0348
2906												
2907	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
2908					k star (bias corrected)	1.029	**Data appear Normal at 5% Significance Level**					
2909					Theta Star	0.0375						
2910					nu star	10.29						
2911												
2912					A-D Test Statistic	0.307	**Nonparametric Statistics**					
2913					5% A-D Critical Value	0.684				Kaplan-Meier (KM) Method		
2914					K-S Test Statistic	0.684				Mean		0.0216
2915					5% K-S Critical Value	0.36				SD		0.022

2916	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	0.00681
2917											95% KM (t) UCL	0.0337
2918	Assuming Gamma Distribution										95% KM (z) UCL	0.0328
2919	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0332
2920	Minimum	0.00343									95% KM (bootstrap t) UCL	0.0428
2921	Maximum	0.0918									95% KM (BCA) UCL	0.0428
2922	Mean	0.0455									95% KM (Percentile Bootstrap) UCL	0.0407
2923	Median	0.0386									95% KM (Chebyshev) UCL	0.0513
2924	SD	0.0303									97.5% KM (Chebyshev) UCL	0.0641
2925	k star	1.453									99% KM (Chebyshev) UCL	0.0893
2926	Theta star	0.0313										
2927	Nu star	37.78									Potential UCLs to Use	
2928	AppChi2	24.7									95% KM (t) UCL	0.0337
2929	95% Gamma Approximate UCL	0.0697									95% KM (Percentile Bootstrap) UCL	0.0407
2930	95% Adjusted Gamma UCL	0.0741										
2931	Note: DL/2 is not a recommended method.											
2932												
2933												
2934	Zinc, dissolved (mw-37s)											
2935												
2936	General Statistics											
2937	Number of Valid Data	1									Number of Detected Data	0
2938	Number of Distinct Detected Data	0									Number of Non-Detect Data	1
2939											Percent Non-Detects	100.00%
2940												
2941	Warning: This data set only has 1 observations!											
2942	Data set is too small to compute reliable and meaningful statistics and estimates!											
2943	The data set for variable Zinc, dissolved (mw-37s) was not processed!											
2944												
2945	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2946	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2947												
2948												
2949												
2950	Zinc, dissolved (mw-38d)											
2951												
2952	General Statistics											
2953	Number of Valid Data	1									Number of Detected Data	0
2954	Number of Distinct Detected Data	0									Number of Non-Detect Data	1
2955											Percent Non-Detects	100.00%
2956												
2957	Warning: This data set only has 1 observations!											
2958	Data set is too small to compute reliable and meaningful statistics and estimates!											
2959	The data set for variable Zinc, dissolved (mw-38d) was not processed!											
2960												
2961	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
2962	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
2963												
2964												
2965												
2966	Zinc, dissolved (mw-38s)											
2967												
2968	General Statistics											

2969				Number of Valid Data	1					Number of Detected Data	0	
2970				Number of Distinct Detected Data	0					Number of Non-Detect Data	1	
2971										Percent Non-Detects	100.00%	
2972												
2973												
2974												
2975												
2976												
2977												
2978												
2979												
2980												
2981												
2982												
2983												
2984												
2985				Number of Valid Data	1					Number of Detected Data	0	
2986				Number of Distinct Detected Data	0					Number of Non-Detect Data	1	
2987										Percent Non-Detects	100.00%	
2988												
2989												
2990												
2991												
2992												
2993												
2994												
2995												
2996												
2997												
2998												
2999												
3000												
3001				Number of Valid Data	5					Number of Detected Data	4	
3002				Number of Distinct Detected Data	4					Number of Non-Detect Data	1	
3003										Percent Non-Detects	20.00%	
3004												
3005				Raw Statistics						Log-transformed Statistics		
3006				Minimum Detected	0.0076					Minimum Detected	-4.88	
3007				Maximum Detected	0.018					Maximum Detected	-4.017	
3008				Mean of Detected	0.0124					Mean of Detected	-4.441	
3009				SD of Detected	0.00434					SD of Detected	0.357	
3010				Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298	
3011				Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298	
3012												
3013												
3014												
3015												
3016												
3017												
3018												
3019												
3020												
3021												

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Zinc, dissolved (mw-38s) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Zinc, dissolved (mw-39-60)

General Statistics

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Zinc, dissolved (mw-39-60) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Zinc, dissolved (mw-4)

General Statistics

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

3022	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3023				Shapiro Wilk Test Statistic		0.982				Shapiro Wilk Test Statistic		0.996
3024				5% Shapiro Wilk Critical Value		0.748				5% Shapiro Wilk Critical Value		0.748
3025	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3026												
3027	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3028				DL/2 Substitution Method						DL/2 Substitution Method		
3029				Mean		0.0104				Mean		-4.751
3030				SD		0.00579				SD		0.759
3031				95% DL/2 (t) UCL		0.0159				95% H-Stat (DL/2) UCL		0.0506
3032												
3033				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
3034				Mean		0.0103				Mean in Log Scale		-4.633
3035				SD		0.0054				SD in Log Scale		0.529
3036				95% MLE (t) UCL		0.0155				Mean in Original Scale		0.0108
3037				95% MLE (Tiku) UCL		0.0157				SD in Original Scale		0.00514
3038										95% Percentile Bootstrap UCL		0.0143
3039										95% BCA Bootstrap UCL		0.0145
3040												
3041	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3042				k star (bias corrected)		2.856	**Data appear Normal at 5% Significance Level**					
3043				Theta Star		0.00432						
3044				nu star		22.85						
3045												
3046				A-D Test Statistic		0.204	**Nonparametric Statistics**					
3047				5% A-D Critical Value		0.657				Kaplan-Meier (KM) Method		
3048				K-S Test Statistic		0.657				Mean		0.0114
3049				5% K-S Critical Value		0.395				SD		0.00386
3050	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.00199
3051										95% KM (t) UCL		0.0157
3052	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0147
3053				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0157
3054				Minimum		0.00683				95% KM (bootstrap t) UCL		0.0155
3055				Maximum		0.018				95% KM (BCA) UCL		0.0152
3056				Mean		0.0112				95% KM (Percentile Bootstrap) UCL		0.0149
3057				Median		0.011				95% KM (Chebyshev) UCL		0.0201
3058				SD		0.0045				97.5% KM (Chebyshev) UCL		0.0239
3059				k star		3.395				99% KM (Chebyshev) UCL		0.0312
3060				Theta star		0.00331						
3061				Nu star		33.95	**Potential UCLs to Use**					
3062				AppChi2		21.62				95% KM (t) UCL		0.0157
3063				95% Gamma Approximate UCL		0.0177				95% KM (Percentile Bootstrap) UCL		0.0149
3064				95% Adjusted Gamma UCL		N/A						
3065	**Note: DL/2 is not a recommended method.**											
3066												
3067												
3068	**Zinc, dissolved (mw-40d)**											
3069												
3070	**General Statistics**											
3071				Number of Valid Data		1				Number of Detected Data		0
3072				Number of Distinct Detected Data		0				Number of Non-Detect Data		1
3073										Percent Non-Detects		100.00%
3074												

	A	B	C	D	E	F	G	H	I	J	K	L
3075	Warning: This data set only has 1 observations!											
3076	Data set is too small to compute reliable and meaningful statistics and estimates!											
3077	The data set for variable Zinc, dissolved (mw-40d) was not processed!											
3078												
3079	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3080	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3081												
3082												
3083												
3084	Zinc, dissolved (mw-40s)											
3085												
3086	General Statistics											
3087						Number of Valid Data	1			Number of Detected Data	0	
3088						Number of Distinct Detected Data	0			Number of Non-Detect Data	1	
3089										Percent Non-Detects	100.00%	
3090												
3091	Warning: This data set only has 1 observations!											
3092	Data set is too small to compute reliable and meaningful statistics and estimates!											
3093	The data set for variable Zinc, dissolved (mw-40s) was not processed!											
3094												
3095	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3096	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3097												
3098												
3099												
3100	Zinc, dissolved (mw-43-25)											
3101												
3102	General Statistics											
3103						Number of Valid Data	3			Number of Detected Data	0	
3104						Number of Distinct Detected Data	0			Number of Non-Detect Data	3	
3105										Percent Non-Detects	100.00%	
3106												
3107	Warning: This data set only has 3 observations!											
3108	Data set is too small to compute reliable and meaningful statistics and estimates!											
3109	The data set for variable Zinc, dissolved (mw-43-25) was not processed!											
3110												
3111	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3112	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3113												
3114												
3115												
3116	Zinc, dissolved (mw-44-115)											
3117												
3118	General Statistics											
3119						Number of Valid Data	3			Number of Detected Data	1	
3120						Number of Distinct Detected Data	1			Number of Non-Detect Data	2	
3121										Percent Non-Detects	66.67%	
3122												
3123	Warning: This data set only has 3 observations!											
3124	Data set is too small to compute reliable and meaningful statistics and estimates!											
3125	The data set for variable Zinc, dissolved (mw-44-115) was not processed!											
3126												
3127	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											

	A	B	C	D	E	F	G	H	I	J	K	L
3128	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3129												
3130												
3131												
3132	Zinc, dissolved (mw-44-125)											
3133												
3134	General Statistics											
3135					Number of Valid Data	1			Number of Detected Data			0
3136					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
3137									Percent Non-Detects			100.00%
3138												
3139	Warning: This data set only has 1 observations!											
3140	Data set is too small to compute reliable and meaningful statistics and estimates!											
3141	The data set for variable Zinc, dissolved (mw-44-125) was not processed!											
3142												
3143	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3144	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3145												
3146												
3147												
3148	Zinc, dissolved (mw-45-095a)											
3149												
3150	General Statistics											
3151					Number of Valid Observations	1			Number of Distinct Observations			1
3152												
3153												
3154	Warning: This data set only has 1 observations!											
3155	Data set is too small to compute reliable and meaningful statistics and estimates!											
3156	The data set for variable Zinc, dissolved (mw-45-095a) was not processed!											
3157												
3158	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3159	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3160												
3161												
3162												
3163	Zinc, dissolved (mw-46-175)											
3164												
3165	General Statistics											
3166					Number of Valid Data	1			Number of Detected Data			0
3167					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
3168									Percent Non-Detects			100.00%
3169												
3170	Warning: This data set only has 1 observations!											
3171	Data set is too small to compute reliable and meaningful statistics and estimates!											
3172	The data set for variable Zinc, dissolved (mw-46-175) was not processed!											
3173												
3174	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
3175	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
3176												
3177												
3178												
3179	Zinc, dissolved (mw-47-55)											
3180												

3181	**General Statistics**											
3182					Number of Valid Data	1			Number of Detected Data			0
3183					Number of Distinct Detected Data	0			Number of Non-Detect Data			1
3184									Percent Non-Detects			100.00%
3185												
3186	**Warning: This data set only has 1 observations!**											
3187	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3188	**The data set for variable Zinc, dissolved (mw-47-55) was not processed!**											
3189												
3190	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3191	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3192												
3193												
3194												
3195	**Zinc, dissolved (mw-48)**											
3196												
3197	**General Statistics**											
3198					Number of Valid Data	3			Number of Detected Data			0
3199					Number of Distinct Detected Data	0			Number of Non-Detect Data			3
3200									Percent Non-Detects			100.00%
3201												
3202	**Warning: This data set only has 3 observations!**											
3203	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3204	**The data set for variable Zinc, dissolved (mw-48) was not processed!**											
3205												
3206	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3207	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3208												
3209												
3210												
3211	**Zinc, dissolved (mw-5)**											
3212												
3213	**General Statistics**											
3214					Number of Valid Data	5			Number of Detected Data			3
3215					Number of Distinct Detected Data	3			Number of Non-Detect Data			2
3216									Percent Non-Detects			40.00%
3217												
3218	**Raw Statistics**						**Log-transformed Statistics**					
3219					Minimum Detected	0.0044			Minimum Detected			-5.426
3220					Maximum Detected	0.0367			Maximum Detected			-3.305
3221					Mean of Detected	0.0167			Mean of Detected			-4.481
3222					SD of Detected	0.0175			SD of Detected			1.079
3223					Minimum Non-Detect	0.005			Minimum Non-Detect			-5.298
3224					Maximum Non-Detect	0.0321			Maximum Non-Detect			-3.439
3225												
3226	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			4
3227	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			1
3228	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			80.00%
3229												
3230	**Warning: There are only 3 Distinct Detected Values in this data set**											
3231	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3232	**Those methods will return a 'N/A' value on your output display!**											
3233												

	A	B	C	D	E	F	G	H	I	J	K	L
3234	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
3235	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
3236												
3237												
3238	UCL Statistics											
3239	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
3240					Shapiro Wilk Test Statistic	0.854					Shapiro Wilk Test Statistic	0.966
3241					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
3242	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
3243												
3244	Assuming Normal Distribution						Assuming Lognormal Distribution					
3245					DL/2 Substitution Method						DL/2 Substitution Method	
3246					Mean	0.0137					Mean	-4.713
3247					SD	0.0139					SD	1.056
3248					95% DL/2 (t) UCL	0.0269					95% H-Stat (DL/2) UCL	0.269
3249												
3250					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3251	MLE method failed to converge properly										Mean in Log Scale	-4.832
3252											SD in Log Scale	0.913
3253											Mean in Original Scale	0.0119
3254											SD in Original Scale	0.014
3255											95% Percentile Bootstrap UCL	0.0237
3256											95% BCA Bootstrap UCL	0.0247
3257												
3258	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
3259					k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level					
3260					Theta Star	N/A						
3261					nu star	N/A						
3262												
3263					A-D Test Statistic	0.34	Nonparametric Statistics					
3264					5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method					
3265					K-S Test Statistic	N/A					Mean	0.0121
3266					5% K-S Critical Value	N/A					SD	0.0125
3267	Data not Gamma Distributed at 5% Significance Level										SE of Mean	0.00685
3268											95% KM (t) UCL	0.0267
3269	Assuming Gamma Distribution										95% KM (z) UCL	0.0234
3270					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0254
3271					Minimum	N/A					95% KM (bootstrap t) UCL	0.051
3272					Maximum	N/A					95% KM (BCA) UCL	0.0367
3273					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0367
3274					Median	N/A					95% KM (Chebyshev) UCL	0.042
3275					SD	N/A					97.5% KM (Chebyshev) UCL	0.0549
3276					k star	N/A					99% KM (Chebyshev) UCL	0.0803
3277					Theta star	N/A						
3278					Nu star	N/A	Potential UCLs to Use					
3279					AppChi2	N/A					95% KM (t) UCL	0.0267
3280					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0367
3281					95% Adjusted Gamma UCL	N/A						
3282	Note: DL/2 is not a recommended method.											
3283												
3284												
3285	Zinc, dissolved (mw-50-200)											
3286												

3287	**General Statistics**											
3288					Number of Valid Data	3			Number of Detected Data	1		
3289					Number of Distinct Detected Data	1			Number of Non-Detect Data	2		
3290									Percent Non-Detects	66.67%		
3291												
3292	**Warning: This data set only has 3 observations!**											
3293	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3294	**The data set for variable Zinc, dissolved (mw-50-200) was not processed!**											
3295												
3296	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3297	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3298												
3299												
3300												
3301	**Zinc, dissolved (mw-51)**											
3302												
3303	**General Statistics**											
3304					Number of Valid Data	3			Number of Detected Data	1		
3305					Number of Distinct Detected Data	1			Number of Non-Detect Data	2		
3306									Percent Non-Detects	66.67%		
3307												
3308	**Warning: This data set only has 3 observations!**											
3309	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3310	**The data set for variable Zinc, dissolved (mw-51) was not processed!**											
3311												
3312	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3313	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3314												
3315												
3316												
3317	**Zinc, dissolved (mw-6)**											
3318												
3319	**General Statistics**											
3320					Number of Valid Data	5			Number of Detected Data	2		
3321					Number of Distinct Detected Data	2			Number of Non-Detect Data	3		
3322									Percent Non-Detects	60.00%		
3323												
3324	**Raw Statistics**						**Log-transformed Statistics**					
3325					Minimum Detected	0.0066			Minimum Detected	-5.021		
3326					Maximum Detected	0.0378			Maximum Detected	-3.275		
3327					Mean of Detected	0.0222			Mean of Detected	-4.148		
3328					SD of Detected	0.0221			SD of Detected	1.234		
3329					Minimum Non-Detect	0.005			Minimum Non-Detect	-5.298		
3330					Maximum Non-Detect	0.0274			Maximum Non-Detect	-3.597		
3331												
3332	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	4		
3333	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	1		
3334	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	80.00%		
3335												
3336	**Warning: Data set has only 2 Distinct Detected Values.**											
3337	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
3338	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
3339												

3340	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
3341												
3342	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3343	**Those methods will return a 'N/A' value on your output display!**											
3344												
3345	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
3346	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
3347												
3348												
3349	**UCL Statistics**											
3350	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3351				Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1	
3352				5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A	
3353	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
3354												
3355	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3356				DL/2 Substitution Method						DL/2 Substitution Method		
3357				Mean	0.0126					Mean	-4.914	
3358				SD	0.0148					SD	1.163	
3359				95% DL/2 (t) UCL	0.0267					95% H-Stat (DL/2) UCL	0.377	
3360												
3361				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3362	**MLE method failed to converge properly**									Mean in Log Scale	N/A	
3363										SD in Log Scale	N/A	
3364										Mean in Original Scale	N/A	
3365										SD in Original Scale	N/A	
3366										95% Percentile Bootstrap UCL	N/A	
3367										95% BCA Bootstrap UCL	N/A	
3368												
3369	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3370				k star (bias corrected)	N/A		**Data do not follow a Discernable Distribution (0.05)**					
3371				Theta Star	N/A							
3372				nu star	N/A							
3373												
3374				A-D Test Statistic	0.358		**Nonparametric Statistics**					
3375				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
3376				K-S Test Statistic	N/A					Mean	0.0128	
3377				5% K-S Critical Value	N/A					SD	0.0125	
3378	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00789	
3379										95% KM (t) UCL	0.0297	
3380	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0258	
3381				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0392	
3382				Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308	
3383				Maximum	N/A					95% KM (BCA) UCL	0.0378	
3384				Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0378	
3385				Median	N/A					95% KM (Chebyshev) UCL	0.0472	
3386				SD	N/A					97.5% KM (Chebyshev) UCL	0.0621	
3387				k star	N/A					99% KM (Chebyshev) UCL	0.0914	
3388				Theta star	N/A							
3389				Nu star	N/A					**Potential UCLs to Use**		
3390				AppChi2	N/A					95% KM (BCA) UCL	0.0378	
3391				95% Gamma Approximate UCL	N/A							
3392				95% Adjusted Gamma UCL	N/A							

	A	B	C	D	E	F	G	H	I	J	K	L
3393	**Note: DL/2 is not a recommended method.**											
3394												
3395												
3396	**Zinc, dissolved (mw-7)**											
3397												
3398	**General Statistics**											
3399					Number of Valid Data	5			Number of Detected Data			3
3400					Number of Distinct Detected Data	3			Number of Non-Detect Data			2
3401									Percent Non-Detects			40.00%
3402												
3403	**Raw Statistics**						**Log-transformed Statistics**					
3404					Minimum Detected	0.0076			Minimum Detected			-4.88
3405					Maximum Detected	0.018			Maximum Detected			-4.017
3406					Mean of Detected	0.0127			Mean of Detected			-4.429
3407					SD of Detected	0.00521			SD of Detected			0.432
3408					Minimum Non-Detect	0.005			Minimum Non-Detect			-5.298
3409					Maximum Non-Detect	0.0161			Maximum Non-Detect			-4.129
3410												
3411	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			4
3412	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			1
3413	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			80.00%
3414												
3415	**Warning: There are only 3 Distinct Detected Values in this data set**											
3416	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3417	**Those methods will return a 'N/A' value on your output display!**											
3418												
3419	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
3420	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
3421												
3422												
3423	**UCL Statistics**											
3424	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3425					Shapiro Wilk Test Statistic	0.998			Shapiro Wilk Test Statistic			0.994
3426					5% Shapiro Wilk Critical Value	0.767			5% Shapiro Wilk Critical Value			0.767
3427	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3428												
3429	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3430					DL/2 Substitution Method				DL/2 Substitution Method			
3431					Mean	0.00971			Mean			-4.82
3432					SD	0.00581			SD			0.742
3433					95% DL/2 (t) UCL	0.0153			95% H-Stat (DL/2) UCL			0.044
3434												
3435					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
3436	**MLE method failed to converge properly**								Mean in Log Scale			-4.696
3437									SD in Log Scale			0.507
3438									Mean in Original Scale			0.0101
3439									SD in Original Scale			0.00518
3440									95% Percentile Bootstrap UCL			0.0137
3441									95% BCA Bootstrap UCL			0.0139
3442												
3443	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3444					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
3445					Theta Star	N/A						

3446					nu star	N/A						
3447												
3448					A-D Test Statistic	0.247	**Nonparametric Statistics**					
3449					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
3450					K-S Test Statistic	N/A					Mean	0.011
3451					5% K-S Critical Value	N/A					SD	0.00406
3452	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00231
3453											95% KM (t) UCL	0.0159
3454	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0148
3455					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0162
3456					Minimum	N/A					95% KM (bootstrap t) UCL	0.0151
3457					Maximum	N/A					95% KM (BCA) UCL	N/A
3458					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.018
3459					Median	N/A					95% KM (Chebyshev) UCL	0.021
3460					SD	N/A					97.5% KM (Chebyshev) UCL	0.0254
3461					k star	N/A					99% KM (Chebyshev) UCL	0.034
3462					Theta star	N/A						
3463					Nu star	N/A	**Potential UCLs to Use**					
3464					AppChi2	N/A					95% KM (t) UCL	0.0159
3465					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.018
3466					95% Adjusted Gamma UCL	N/A						
3467	**Note: DL/2 is not a recommended method.**											
3468												
3469												
3470	**Zinc, dissolved (mw-8)**											
3471												
3472	**General Statistics**											
3473					Number of Valid Data	5					Number of Detected Data	3
3474					Number of Distinct Detected Data	3					Number of Non-Detect Data	2
3475											Percent Non-Detects	40.00%
3476												
3477	**Raw Statistics**						**Log-transformed Statistics**					
3478					Minimum Detected	0.007					Minimum Detected	-4.962
3479					Maximum Detected	0.0727					Maximum Detected	-2.621
3480					Mean of Detected	0.0306					Mean of Detected	-4.002
3481					SD of Detected	0.0366					SD of Detected	1.226
3482					Minimum Non-Detect	0.005					Minimum Non-Detect	-5.298
3483					Maximum Non-Detect	0.0137					Maximum Non-Detect	-4.29
3484												
3485	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	4
3486	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
3487	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	80.00%
3488												
3489	**Warning: There are only 3 Distinct Detected Values in this data set**											
3490	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3491	**Those methods will return a 'N/A' value on your output display!**											
3492												
3493	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
3494	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
3495												
3496												
3497	**UCL Statistics**											
3498	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					

3499					Shapiro Wilk Test Statistic	0.807					Shapiro Wilk Test Statistic	0.912
3500					5% Shapiro Wilk Critical Value	0.767					5% Shapiro Wilk Critical Value	0.767
3501					**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
3502												
3503					**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
3504					DL/2 Substitution Method						DL/2 Substitution Method	
3505					Mean	0.0202					Mean	-4.596
3506					SD	0.0295					SD	1.241
3507					95% DL/2 (t) UCL	0.0484					95% H-Stat (DL/2) UCL	0.88
3508												
3509					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3510					**MLE method failed to converge properly**						Mean in Log Scale	-4.786
3511											SD in Log Scale	1.471
3512											Mean in Original Scale	0.0196
3513											SD in Original Scale	0.0299
3514											95% Percentile Bootstrap UCL	0.0453
3515											95% BCA Bootstrap UCL	0.0474
3516												
3517					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
3518					k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**	
3519					Theta Star	N/A						
3520					nu star	N/A						
3521												
3522					A-D Test Statistic	0.424					**Nonparametric Statistics**	
3523					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
3524					K-S Test Statistic	N/A					Mean	0.0215
3525					5% K-S Critical Value	N/A					SD	0.0257
3526					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0141
3527											95% KM (t) UCL	0.0515
3528					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0447
3529					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0485
3530					Minimum	N/A					95% KM (bootstrap t) UCL	0.171
3531					Maximum	N/A					95% KM (BCA) UCL	0.0727
3532					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0727
3533					Median	N/A					95% KM (Chebyshev) UCL	0.0829
3534					SD	N/A					97.5% KM (Chebyshev) UCL	0.109
3535					k star	N/A					99% KM (Chebyshev) UCL	0.162
3536					Theta star	N/A						
3537					Nu star	N/A					**Potential UCLs to Use**	
3538					AppChi2	N/A					95% KM (t) UCL	0.0515
3539					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	0.0727
3540					95% Adjusted Gamma UCL	N/A						
3541	**Note: DL/2 is not a recommended method.**											
3542												
3543												
3544	**Zinc, dissolved (mw-9)**											
3545												
3546						**General Statistics**							
3547					Number of Valid Data	27					Number of Detected Data	26
3548					Number of Distinct Detected Data	25					Number of Non-Detect Data	1
3549											Percent Non-Detects	3.70%
3550												
3551					**Raw Statistics**						**Log-transformed Statistics**	

3552				Minimum Detected	0.0034					Minimum Detected	-5.684	
3553				Maximum Detected	0.363					Maximum Detected	-1.013	
3554				Mean of Detected	0.0802					Mean of Detected	-3.322	
3555				SD of Detected	0.108					SD of Detected	1.293	
3556				Minimum Non-Detect	0.082					Minimum Non-Detect	-2.501	
3557				Maximum Non-Detect	0.082					Maximum Non-Detect	-2.501	
3558												
3559												
3560				**UCL Statistics**								
3561	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
3562				Shapiro Wilk Test Statistic	0.696					Shapiro Wilk Test Statistic	0.943	
3563				5% Shapiro Wilk Critical Value	0.92					5% Shapiro Wilk Critical Value	0.92	
3564	**Data not Normal at 5% Significance Level**									**Data appear Lognormal at 5% Significance Level**		
3565												
3566	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
3567				DL/2 Substitution Method						DL/2 Substitution Method		
3568				Mean	0.0787					Mean	-3.317	
3569				SD	0.106					SD	1.268	
3570				95% DL/2 (t) UCL	0.113					95% H-Stat (DL/2) UCL	0.153	
3571												
3572				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
3573	**MLE yields a negative mean**									Mean in Log Scale	-3.339	
3574										SD in Log Scale	1.271	
3575										Mean in Original Scale	0.0781	
3576										SD in Original Scale	0.106	
3577										95% Percentile Bootstrap UCL	0.111	
3578										95% BCA Bootstrap UCL	0.121	
3579												
3580	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
3581				k star (bias corrected)	0.689					**Data appear Lognormal at 5% Significance Level**		
3582				Theta Star	0.116							
3583				nu star	35.83							
3584												
3585				A-D Test Statistic	1.228					**Nonparametric Statistics**		
3586				5% A-D Critical Value	0.784					Kaplan-Meier (KM) Method		
3587				K-S Test Statistic	0.784					Mean	0.0782	
3588				5% K-S Critical Value	0.178					SD	0.104	
3589	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.0204	
3590										95% KM (t) UCL	0.113	
3591	**Assuming Gamma Distribution**									95% KM (z) UCL	0.112	
3592				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.113	
3593				Minimum	0.0034					95% KM (bootstrap t) UCL	0.13	
3594				Maximum	0.363					95% KM (BCA) UCL	0.115	
3595				Mean	0.0784					95% KM (Percentile Bootstrap) UCL	0.111	
3596				Median	0.025					95% KM (Chebyshev) UCL	0.167	
3597				SD	0.106					97.5% KM (Chebyshev) UCL	0.206	
3598				k star	0.705					99% KM (Chebyshev) UCL	0.282	
3599				Theta star	0.111							
3600				Nu star	38.09					**Potential UCLs to Use**		
3601				AppChi2	24.95					97.5% KM (Chebyshev) UCL	0.206	
3602				95% Gamma Approximate UCL	0.12							
3603				95% Adjusted Gamma UCL	0.123							
3604	**Note: DL/2 is not a recommended method.**											

	A	B	C	D	E	F	G	H	I	J	K	L
3605												
3606												
3607	**Zinc, dissolved (ow-1d)**											
3608												
3609	**General Statistics**											
3610					Number of Valid Data	15			Number of Detected Data			3
3611					Number of Distinct Detected Data	3			Number of Non-Detect Data			12
3612									Percent Non-Detects			80.00%
3613												
3614	**Raw Statistics**						**Log-transformed Statistics**					
3615					Minimum Detected	0.0307			Minimum Detected			-3.483
3616					Maximum Detected	0.0383			Maximum Detected			-3.262
3617					Mean of Detected	0.035			Mean of Detected			-3.357
3618					SD of Detected	0.0039			SD of Detected			0.114
3619					Minimum Non-Detect	0.01			Minimum Non-Detect			-4.605
3620					Maximum Non-Detect	0.0208			Maximum Non-Detect			-3.873
3621												
3622	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			12
3623	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			3
3624	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			80.00%
3625												
3626	**Warning: There are only 3 Distinct Detected Values in this data set**											
3627	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3628	**Those methods will return a 'N/A' value on your output display!**											
3629												
3630	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
3631	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
3632												
3633												
3634	**UCL Statistics**											
3635	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3636					Shapiro Wilk Test Statistic	0.951			Shapiro Wilk Test Statistic			0.939
3637					5% Shapiro Wilk Critical Value	0.767			5% Shapiro Wilk Critical Value			0.767
3638	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3639												
3640	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3641					DL/2 Substitution Method				DL/2 Substitution Method			
3642					Mean	0.0139			Mean			-4.508
3643					SD	0.0112			SD			0.658
3644					95% DL/2 (t) UCL	0.019			95% H-Stat (DL/2) UCL			0.0181
3645												
3646					Maximum Likelihood Estimate(MLE) Method				Log ROS Method			
3647					Mean	0.0161			Mean in Log Scale			-3.806
3648					SD	0.0167			SD in Log Scale			0.286
3649					95% MLE (t) UCL	0.0237			Mean in Original Scale			0.0231
3650					95% MLE (Tiku) UCL	0.0313			SD in Original Scale			0.00707
3651									95% Percentile Bootstrap UCL			0.0262
3652									95% BCA Bootstrap UCL			0.0263
3653												
3654	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3655					k star (bias corrected)	N/A	**Data appear Normal at 5% Significance Level**					
3656					Theta Star	N/A						
3657					nu star	N/A						

3658												
3659					A-D Test Statistic	0.326	**Nonparametric Statistics**					
3660					5% A-D Critical Value	N/A				Kaplan-Meier (KM) Method		
3661					K-S Test Statistic	N/A				Mean		0.0316
3662					5% K-S Critical Value	N/A				SD		0.00223
3663			**Data not Gamma Distributed at 5% Significance Level**							SE of Mean		0.000706
3664										95% KM (t) UCL		0.0328
3665			**Assuming Gamma Distribution**							95% KM (z) UCL		0.0327
3666			Gamma ROS Statistics using Extrapolated Data							95% KM (jackknife) UCL		0.035
3667					Minimum	N/A				95% KM (bootstrap t) UCL		0.032
3668					Maximum	N/A				95% KM (BCA) UCL		0.0383
3669					Mean	N/A				95% KM (Percentile Bootstrap) UCL		0.0383
3670					Median	N/A				95% KM (Chebyshev) UCL		0.0346
3671					SD	N/A				97.5% KM (Chebyshev) UCL		0.036
3672					k star	N/A				99% KM (Chebyshev) UCL		0.0386
3673					Theta star	N/A						
3674					Nu star	N/A	**Potential UCLs to Use**					
3675					AppChi2	N/A				95% KM (t) UCL		0.0328
3676					95% Gamma Approximate UCL	N/A				95% KM (Percentile Bootstrap) UCL		0.0383
3677					95% Adjusted Gamma UCL	N/A						
3678	**Note: DL/2 is not a recommended method.**											
3679												
3680												
3681	**Zinc, dissolved (ow-1m)**											
3682												
3683					**General Statistics**							
3684					Number of Valid Data	15				Number of Detected Data		4
3685					Number of Distinct Detected Data	4				Number of Non-Detect Data		11
3686										Percent Non-Detects		73.33%
3687												
3688					**Raw Statistics**					**Log-transformed Statistics**		
3689					Minimum Detected	0.0131				Minimum Detected		-4.335
3690					Maximum Detected	0.0461				Maximum Detected		-3.077
3691					Mean of Detected	0.0262				Mean of Detected		-3.747
3692					SD of Detected	0.0141				SD of Detected		0.52
3693					Minimum Non-Detect	0.01				Minimum Non-Detect		-4.605
3694					Maximum Non-Detect	0.02				Maximum Non-Detect		-3.912
3695												
3696	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		12
3697	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		3
3698	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		80.00%
3699												
3700	**Warning: There are only 4 Distinct Detected Values in this data**											
3701	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3702	**the resulting calculations may not be reliable enough tp draw conclusions**											
3703												
3704	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3705												
3706												
3707					**UCL Statistics**							
3708			**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**		
3709					Shapiro Wilk Test Statistic	0.905				Shapiro Wilk Test Statistic		0.98
3710					5% Shapiro Wilk Critical Value	0.748				5% Shapiro Wilk Critical Value		0.748

3711	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3712												
3713	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3714				DL/2 Substitution Method						DL/2 Substitution Method		
3715				Mean		0.0136				Mean		-4.468
3716				SD		0.0103				SD		0.548
3717				95% DL/2 (t) UCL		0.0183				95% H-Stat (DL/2) UCL		0.019
3718												
3719				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		
3720				Mean		0.00244				Mean in Log Scale		-4.805
3721				SD		0.0205				SD in Log Scale		0.841
3722				95% MLE (t) UCL		0.0117				Mean in Original Scale		0.0116
3723				95% MLE (Tiku) UCL		0.025				SD in Original Scale		0.0116
3724										95% Percentile Bootstrap UCL		0.0166
3725										95% BCA Bootstrap UCL		0.0189
3726												
3727	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3728				k star (bias corrected)		1.416	**Data appear Normal at 5% Significance Level**					
3729				Theta Star		0.0185						
3730				nu star		11.33						
3731												
3732				A-D Test Statistic		0.271	**Nonparametric Statistics**					
3733				5% A-D Critical Value		0.659				Kaplan-Meier (KM) Method		
3734				K-S Test Statistic		0.659				Mean		0.0166
3735				5% K-S Critical Value		0.396				SD		0.00856
3736	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.00255
3737										95% KM (t) UCL		0.0211
3738	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0208
3739				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0221
3740				Minimum		0.0131				95% KM (bootstrap t) UCL		0.0222
3741				Maximum		0.0461				95% KM (BCA) UCL		0.0303
3742				Mean		0.0257				95% KM (Percentile Bootstrap) UCL		0.0274
3743				Median		0.0245				95% KM (Chebyshev) UCL		0.0277
3744				SD		0.00742				97.5% KM (Chebyshev) UCL		0.0325
3745				k star		11.15				99% KM (Chebyshev) UCL		0.042
3746				Theta star		0.00231						
3747				Nu star		334.5	**Potential UCLs to Use**					
3748				AppChi2		293.1				95% KM (t) UCL		0.0211
3749				95% Gamma Approximate UCL		0.0293				95% KM (Percentile Bootstrap) UCL		0.0274
3750				95% Adjusted Gamma UCL		N/A						
3751	**Note: DL/2 is not a recommended method.**											
3752												
3753												
3754	**Zinc, dissolved (ow-1s)**											
3755												
3756	**General Statistics**											
3757				Number of Valid Data		13				Number of Detected Data		1
3758				Number of Distinct Detected Data		1				Number of Non-Detect Data		12
3759										Percent Non-Detects		92.31%
3760												
3761	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
3762	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
3763												

3764	**The data set for variable Zinc, dissolved (ow-1s) was not processed!**											
3765												
3766												
3767												
3768	**Zinc, dissolved (ow-2d)**											
3769												
3770	**General Statistics**											
3771					Number of Valid Data	14			Number of Detected Data	1		
3772					Number of Distinct Detected Data	1			Number of Non-Detect Data	13		
3773									Percent Non-Detects	92.86%		
3774												
3775	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
3776	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
3777												
3778	**The data set for variable Zinc, dissolved (ow-2d) was not processed!**											
3779												
3780												
3781												
3782	**Zinc, dissolved (ow-2m)**											
3783												
3784	**General Statistics**											
3785					Number of Valid Data	13			Number of Detected Data	3		
3786					Number of Distinct Detected Data	3			Number of Non-Detect Data	10		
3787									Percent Non-Detects	76.92%		
3788												
3789	**Raw Statistics**								**Log-transformed Statistics**			
3790					Minimum Detected	0.0113			Minimum Detected	-4.483		
3791					Maximum Detected	0.0388			Maximum Detected	-3.249		
3792					Mean of Detected	0.0257			Mean of Detected	-3.78		
3793					SD of Detected	0.0138			SD of Detected	0.635		
3794					Minimum Non-Detect	0.01			Minimum Non-Detect	-4.605		
3795					Maximum Non-Detect	0.02			Maximum Non-Detect	-3.912		
3796												
3797	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect	11		
3798	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected	2		
3799	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage	84.62%		
3800												
3801	**Warning: There are only 3 Distinct Detected Values in this data set**											
3802	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
3803	**Those methods will return a 'N/A' value on your output display!**											
3804												
3805	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
3806	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
3807												
3808												
3809	**UCL Statistics**											
3810	**Normal Distribution Test with Detected Values Only**								**Lognormal Distribution Test with Detected Values Only**			
3811					Shapiro Wilk Test Statistic	0.993			Shapiro Wilk Test Statistic	0.945		
3812					5% Shapiro Wilk Critical Value	0.767			5% Shapiro Wilk Critical Value	0.767		
3813	**Data appear Normal at 5% Significance Level**								**Data appear Lognormal at 5% Significance Level**			
3814												
3815	**Assuming Normal Distribution**								**Assuming Lognormal Distribution**			
3816					DL/2 Substitution Method				DL/2 Substitution Method			

3817					Mean	0.0126					Mean	-4.559
3818					SD	0.00959					SD	0.579
3819					95% DL/2 (t) UCL	0.0173					95% H-Stat (DL/2) UCL	0.0181
3820												
3821					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
3822					**MLE method failed to converge properly**						Mean in Log Scale	-5.052
3823											SD in Log Scale	0.957
3824											Mean in Original Scale	0.01
3825											SD in Original Scale	0.011
3826											95% Percentile Bootstrap UCL	0.0154
3827											95% BCA Bootstrap UCL	0.0168
3828												
3829					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
3830					k star (bias corrected)	N/A					**Data appear Normal at 5% Significance Level**	
3831					Theta Star	N/A						
3832					nu star	N/A						
3833												
3834					A-D Test Statistic	0.296					**Nonparametric Statistics**	
3835					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
3836					K-S Test Statistic	N/A					Mean	0.0146
3837					5% K-S Critical Value	N/A					SD	0.00814
3838					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.00277
3839											95% KM (t) UCL	0.0196
3840					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0192
3841					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.025
3842					Minimum	N/A					95% KM (bootstrap t) UCL	0.0161
3843					Maximum	N/A					95% KM (BCA) UCL	0.0388
3844					Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
3845					Median	N/A					95% KM (Chebyshev) UCL	0.0267
3846					SD	N/A					97.5% KM (Chebyshev) UCL	0.0319
3847					k star	N/A					99% KM (Chebyshev) UCL	0.0421
3848					Theta star	N/A						
3849					Nu star	N/A					**Potential UCLs to Use**	
3850					AppChi2	N/A					95% KM (t) UCL	0.0196
3851					95% Gamma Approximate UCL	N/A					95% KM (Percentile Bootstrap) UCL	N/A
3852					95% Adjusted Gamma UCL	N/A						
3853	**Note: DL/2 is not a recommended method.**											
3854												
3855												
3856	**Zinc, dissolved (ow-2s)**											
3857												
3858						**General Statistics**						
3859					Number of Valid Data	13					Number of Detected Data	1
3860					Number of Distinct Detected Data	1					Number of Non-Detect Data	12
3861											Percent Non-Detects	92.31%
3862												
3863	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
3864	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
3865												
3866	**The data set for variable Zinc, dissolved (ow-2s) was not processed!**											
3867												
3868												
3869												

	A	B	C	D	E	F	G	H	I	J	K	L
3870	**Zinc, dissolved (ow-3d)**											
3871												
3872	**General Statistics**											
3873	Number of Valid Observations					2	Number of Distinct Observations					2
3874												
3875												
3876	**Warning: This data set only has 2 observations!**											
3877	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3878	**The data set for variable Zinc, dissolved (ow-3d) was not processed!**											
3879												
3880	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3881	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3882												
3883												
3884												
3885	**Zinc, dissolved (ow-3m)**											
3886												
3887	**General Statistics**											
3888	Number of Valid Data					4	Number of Detected Data					1
3889	Number of Distinct Detected Data					1	Number of Non-Detect Data					3
3890							Percent Non-Detects					75.00%
3891												
3892	**Warning: This data set only has 4 observations!**											
3893	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3894	**The data set for variable Zinc, dissolved (ow-3m) was not processed!**											
3895												
3896	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3897	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3898												
3899												
3900												
3901	**Zinc, dissolved (ow-3s)**											
3902												
3903	**General Statistics**											
3904	Number of Valid Data					3	Number of Detected Data					2
3905	Number of Distinct Detected Data					2	Number of Non-Detect Data					1
3906							Percent Non-Detects					33.33%
3907												
3908	**Warning: This data set only has 3 observations!**											
3909	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
3910	**The data set for variable Zinc, dissolved (ow-3s) was not processed!**											
3911												
3912	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
3913	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
3914												
3915												
3916												
3917	**Zinc, dissolved (ow-5d)**											
3918												
3919	**General Statistics**											
3920	Number of Valid Data					14	Number of Detected Data					5
3921	Number of Distinct Detected Data					5	Number of Non-Detect Data					9
3922							Percent Non-Detects					64.29%

3923												
3924	**Raw Statistics**						**Log-transformed Statistics**					
3925					Minimum Detected	0.0227					Minimum Detected	-3.785
3926					Maximum Detected	0.0367					Maximum Detected	-3.305
3927					Mean of Detected	0.0303					Mean of Detected	-3.509
3928					SD of Detected	0.00524					SD of Detected	0.181
3929					Minimum Non-Detect	0.01					Minimum Non-Detect	-4.605
3930					Maximum Non-Detect	0.02					Maximum Non-Detect	-3.912
3931												
3932	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	9
3933	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	5
3934	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	64.29%
3935												
3936	**Warning: There are only 5 Detected Values in this data**											
3937	**Note: It should be noted that even though bootstrap may be performed on this data set**											
3938	**the resulting calculations may not be reliable enough tp draw conclusions**											
3939												
3940	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
3941												
3942												
3943	**UCL Statistics**											
3944	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
3945					Shapiro Wilk Test Statistic	0.979					Shapiro Wilk Test Statistic	0.956
3946					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
3947	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
3948												
3949	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
3950					DL/2 Substitution Method						DL/2 Substitution Method	
3951					Mean	0.0159					Mean	-4.397
3952					SD	0.0117					SD	0.745
3953					95% DL/2 (t) UCL	0.0214					95% H-Stat (DL/2) UCL	0.0182
3954												
3955					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
3956					Mean	0.016					Mean in Log Scale	-3.909
3957					SD	0.013					SD in Log Scale	0.356
3958					95% MLE (t) UCL	0.0221					Mean in Original Scale	0.0213
3959					95% MLE (Tiku) UCL	0.0253					SD in Original Scale	0.00789
3960											95% Percentile Bootstrap UCL	0.0249
3961											95% BCA Bootstrap UCL	0.0248
3962												
3963	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
3964					k star (bias corrected)	16	**Data appear Normal at 5% Significance Level**					
3965					Theta Star	0.0019						
3966					nu star	160						
3967												
3968					A-D Test Statistic	0.235	**Nonparametric Statistics**					
3969					5% A-D Critical Value	0.678					Kaplan-Meier (KM) Method	
3970					K-S Test Statistic	0.678					Mean	0.0254
3971					5% K-S Critical Value	0.357					SD	0.0046
3972	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00137
3973											95% KM (t) UCL	0.0279
3974	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0277
3975					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0292

3976					Minimum	0.0227				95% KM (bootstrap t) UCL		0.0275
3977					Maximum	0.0367				95% KM (BCA) UCL		0.0335
3978					Mean	0.0302				95% KM (Percentile Bootstrap) UCL		0.0314
3979					Median	0.03				95% KM (Chebyshev) UCL		0.0314
3980					SD	0.00294				97.5% KM (Chebyshev) UCL		0.034
3981					k star	84.99				99% KM (Chebyshev) UCL		0.0391
3982					Theta star	0.0003554						
3983					Nu star	2380				**Potential UCLs to Use**		
3984					AppChi2	2267				95% KM (t) UCL		0.0279
3985					95% Gamma Approximate UCL	0.0317				95% KM (Percentile Bootstrap) UCL		0.0314
3986					95% Adjusted Gamma UCL	0.0319						
3987	**Note: DL/2 is not a recommended method.**											
3988												
3989												
3990	**Zinc, dissolved (ow-5m)**											
3991												
3992						**General Statistics**						
3993					Number of Valid Data	14				Number of Detected Data		5
3994					Number of Distinct Detected Data	5				Number of Non-Detect Data		9
3995										Percent Non-Detects		64.29%
3996												
3997					**Raw Statistics**					**Log-transformed Statistics**		
3998					Minimum Detected	0.0238				Minimum Detected		-3.738
3999					Maximum Detected	0.278				Maximum Detected		-1.28
4000					Mean of Detected	0.0781				Mean of Detected		-3.126
4001					SD of Detected	0.112				SD of Detected		1.047
4002					Minimum Non-Detect	0.01				Minimum Non-Detect		-4.605
4003					Maximum Non-Detect	0.02				Maximum Non-Detect		-3.912
4004												
4005	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		9
4006	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		5
4007	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		64.29%
4008												
4009	**Warning: There are only 5 Detected Values in this data**											
4010	**Note: It should be noted that even though bootstrap may be performed on this data set**											
4011	**the resulting calculations may not be reliable enough tp draw conclusions**											
4012												
4013	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
4014												
4015												
4016						**UCL Statistics**						
4017					**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**		
4018					Shapiro Wilk Test Statistic	0.59				Shapiro Wilk Test Statistic		0.683
4019					5% Shapiro Wilk Critical Value	0.762				5% Shapiro Wilk Critical Value		0.762
4020					**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**		
4021												
4022					**Assuming Normal Distribution**					**Assuming Lognormal Distribution**		
4023					DL/2 Substitution Method					DL/2 Substitution Method		
4024					Mean	0.0332				Mean		-4.229
4025					SD	0.0711				SD		1.06
4026					95% DL/2 (t) UCL	0.0668				95% H-Stat (DL/2) UCL		0.0346
4027												
4028					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		

4029	**MLE yields a negative mean**									Mean in Log Scale		-5.303
4030										SD in Log Scale		1.92
4031										Mean in Original Scale		0.0292
4032										SD in Original Scale		0.0727
4033										95% Percentile Bootstrap UCL		0.0656
4034										95% BCA Bootstrap UCL		0.0885
4035												
4036	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
4037				k star (bias corrected)		0.534				**Data do not follow a Discernable Distribution (0.05)**		
4038				Theta Star		0.146						
4039				nu star		5.339						
4040												
4041				A-D Test Statistic		1.035				**Nonparametric Statistics**		
4042				5% A-D Critical Value		0.691				Kaplan-Meier (KM) Method		
4043				K-S Test Statistic		0.691				Mean		0.0432
4044				5% K-S Critical Value		0.364				SD		0.0652
4045	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.0195
4046										95% KM (t) UCL		0.0777
4047	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0752
4048				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0746
4049				Minimum		1E-09				95% KM (bootstrap t) UCL		1.394
4050				Maximum		0.278				95% KM (BCA) UCL		0.0964
4051				Mean		0.0713				95% KM (Percentile Bootstrap) UCL		0.0801
4052				Median		0.049				95% KM (Chebyshev) UCL		0.128
4053				SD		0.0794				97.5% KM (Chebyshev) UCL		0.165
4054				k star		0.196				99% KM (Chebyshev) UCL		0.237
4055				Theta star		0.364						
4056				Nu star		5.483				**Potential UCLs to Use**		
4057				AppChi2		1.382				95% KM (BCA) UCL		0.0964
4058				95% Gamma Approximate UCL		0.283						
4059				95% Adjusted Gamma UCL		0.346						
4060	**Note: DL/2 is not a recommended method.**											
4061												
4062												
4063	**Zinc, dissolved (ow-5s)**											
4064												
4065							**General Statistics**					
4066				Number of Valid Data		14				Number of Detected Data		2
4067				Number of Distinct Detected Data		2				Number of Non-Detect Data		12
4068										Percent Non-Detects		85.71%
4069												
4070				**Raw Statistics**						**Log-transformed Statistics**		
4071				Minimum Detected		0.0166				Minimum Detected		-4.098
4072				Maximum Detected		0.0256				Maximum Detected		-3.665
4073				Mean of Detected		0.0211				Mean of Detected		-3.882
4074				SD of Detected		0.00636				SD of Detected		0.306
4075				Minimum Non-Detect		0.01				Minimum Non-Detect		-4.605
4076				Maximum Non-Detect		0.02				Maximum Non-Detect		-3.912
4077												
4078	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		13
4079	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
4080	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		92.86%
4081												

4082	Warning: Data set has only 2 Distinct Detected Values.											
4083	This may not be adequate enough to compute meaningful and reliable test statistics and estimates.											
4084	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
4085												
4086	Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.											
4087												
4088	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
4089	Those methods will return a 'N/A' value on your output display!											
4090												
4091	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
4092	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
4093												
4094												
4095	UCL Statistics											
4096	Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only					
4097	Shapiro Wilk Test Statistic				1		Shapiro Wilk Test Statistic					1
4098	5% Shapiro Wilk Critical Value				N/A		5% Shapiro Wilk Critical Value					N/A
4099	Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
4100												
4101	Assuming Normal Distribution						Assuming Lognormal Distribution					
4102	DL/2 Substitution Method						DL/2 Substitution Method					
4103	Mean				0.0104		Mean					-4.654
4104	SD				0.00522		SD					0.427
4105	95% DL/2 (t) UCL				0.0129		95% H-Stat (DL/2) UCL					0.0135
4106												
4107	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
4108	MLE method failed to converge properly						Mean in Log Scale					N/A
4109							SD in Log Scale					N/A
4110							Mean in Original Scale					N/A
4111							SD in Original Scale					N/A
4112							95% Percentile Bootstrap UCL					N/A
4113							95% BCA Bootstrap UCL					N/A
4114												
4115	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
4116	k star (bias corrected)				N/A		Data do not follow a Discernable Distribution (0.05)					
4117	Theta Star				N/A							
4118	nu star				N/A							
4119												
4120	A-D Test Statistic				0.359		Nonparametric Statistics					
4121	5% A-D Critical Value				N/A		Kaplan-Meier (KM) Method					
4122	K-S Test Statistic				N/A		Mean					0.0172
4123	5% K-S Critical Value				N/A		SD					0.00232
4124	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.0008761
4125							95% KM (t) UCL					0.0188
4126	Assuming Gamma Distribution						95% KM (z) UCL					0.0187
4127	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0233
4128	Minimum				N/A		95% KM (bootstrap t) UCL					0.0172
4129	Maximum				N/A		95% KM (BCA) UCL					N/A
4130	Mean				N/A		95% KM (Percentile Bootstrap) UCL					0.0256
4131	Median				N/A		95% KM (Chebyshev) UCL					0.0211
4132	SD				N/A		97.5% KM (Chebyshev) UCL					0.0227
4133	k star				N/A		99% KM (Chebyshev) UCL					0.026
4134	Theta star				N/A							

4135					Nu star	N/A		**Potential UCLs to Use**				
4136					AppChi2	N/A				95% KM (t) UCL		0.0188
4137					95% Gamma Approximate UCL	N/A				95% KM (% Bootstrap) UCL		0.0256
4138					95% Adjusted Gamma UCL	N/A						
4139	**Note: DL/2 is not a recommended method.**											
4140												
4141												
4142	**Zinc, dissolved (park moabi-4)**											
4143												
4144	**General Statistics**											
4145					Number of Valid Observations	1				Number of Distinct Observations		1
4146												
4147												
4148	**Warning: This data set only has 1 observations!**											
4149	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
4150	**The data set for variable Zinc, dissolved (park moabi-4) was not processed!**											
4151												
4152	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
4153	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
4154												
4155												
4156												
4157	**Zinc, dissolved (pge-6)**											
4158												
4159	**General Statistics**											
4160					Number of Valid Data	17				Number of Detected Data		16
4161					Number of Distinct Detected Data	16				Number of Non-Detect Data		1
4162										Percent Non-Detects		5.88%
4163												
4164	**Raw Statistics**							**Log-transformed Statistics**				
4165					Minimum Detected	0.0067				Minimum Detected		-5.006
4166					Maximum Detected	1.5				Maximum Detected		0.405
4167					Mean of Detected	0.142				Mean of Detected		-3.174
4168					SD of Detected	0.365				SD of Detected		1.371
4169					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
4170					Maximum Non-Detect	0.005				Maximum Non-Detect		-5.298
4171												
4172												
4173	**UCL Statistics**											
4174	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
4175					Shapiro Wilk Test Statistic	0.379				Shapiro Wilk Test Statistic		0.928
4176					5% Shapiro Wilk Critical Value	0.887				5% Shapiro Wilk Critical Value		0.887
4177	**Data not Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
4178												
4179	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
4180					DL/2 Substitution Method					DL/2 Substitution Method		
4181					Mean	0.134				Mean		-3.339
4182					SD	0.355				SD		1.493
4183					95% DL/2 (t) UCL	0.285				95% H-Stat (DL/2) UCL		0.341
4184												
4185					Maximum Likelihood Estimate(MLE) Method					Log ROS Method		
4186					Mean	0.12				Mean in Log Scale		-3.368
4187					SD	0.358				SD in Log Scale		1.55

4188					95% MLE (t) UCL	0.271				Mean in Original Scale		0.134
4189					95% MLE (Tiku) UCL	0.257				SD in Original Scale		0.356
4190										95% Percentile Bootstrap UCL		0.301
4191										95% BCA Bootstrap UCL		0.392
4192												
4193			Gamma Distribution Test with Detected Values Only							Data Distribution Test with Detected Values Only		
4194					k star (bias corrected)	0.461				Data appear Lognormal at 5% Significance Level		
4195					Theta Star	0.308						
4196					nu star	14.76						
4197												
4198					A-D Test Statistic	1.549				Nonparametric Statistics		
4199					5% A-D Critical Value	0.795				Kaplan-Meier (KM) Method		
4200					K-S Test Statistic	0.795				Mean		0.134
4201					5% K-S Critical Value	0.227				SD		0.345
4202			Data not Gamma Distributed at 5% Significance Level							SE of Mean		0.0864
4203										95% KM (t) UCL		0.285
4204			Assuming Gamma Distribution							95% KM (z) UCL		0.276
4205					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.285
4206					Minimum	1E-09				95% KM (bootstrap t) UCL		1.232
4207					Maximum	1.5				95% KM (BCA) UCL		0.311
4208					Mean	0.134				95% KM (Percentile Bootstrap) UCL		0.303
4209					Median	0.033				95% KM (Chebyshev) UCL		0.511
4210					SD	0.356				97.5% KM (Chebyshev) UCL		0.674
4211					k star	0.296				99% KM (Chebyshev) UCL		0.994
4212					Theta star	0.452						
4213					Nu star	10.07				Potential UCLs to Use		
4214					AppChi2	3.987				97.5% KM (Chebyshev) UCL		0.674
4215					95% Gamma Approximate UCL	0.338						
4216					95% Adjusted Gamma UCL	0.375						
4217	Note: DL/2 is not a recommended method.											
4218												
4219												
4220	Zinc, dissolved (pge-7)											
4221												
4222						General Statistics						
4223					Number of Valid Observations	15				Number of Distinct Observations		14
4224												
4225			Raw Statistics							Log-transformed Statistics		
4226					Minimum	0.01				Minimum of Log Data		-4.605
4227					Maximum	0.125				Maximum of Log Data		-2.079
4228					Mean	0.0379				Mean of log Data		-3.479
4229					Median	0.029				SD of log Data		0.633
4230					SD	0.0297						
4231					Coefficient of Variation	0.784						
4232					Skewness	2.194						
4233												
4234						Relevant UCL Statistics						
4235			Normal Distribution Test							Lognormal Distribution Test		
4236					Shapiro Wilk Test Statistic	0.741				Shapiro Wilk Test Statistic		0.959
4237					Shapiro Wilk Critical Value	0.881				Shapiro Wilk Critical Value		0.881
4238			Data not Normal at 5% Significance Level							Data appear Lognormal at 5% Significance Level		
4239												
4240			Assuming Normal Distribution							Assuming Lognormal Distribution		

4241				95% Student's-t UCL	0.0514					95% H-UCL	0.0548
4242				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.0647
4243				95% Adjusted-CLT UCL	0.0552					97.5% Chebyshev (MVUE) UCL	0.0767
4244				95% Modified-t UCL	0.0522					99% Chebyshev (MVUE) UCL	0.1
4245											
4246				**Gamma Distribution Test**						**Data Distribution**	
4247				k star (bias corrected)	2.102					**Data appear Gamma Distributed at 5% Significance Level**	
4248				Theta Star	0.018						
4249				nu star	63.06						
4250				Approximate Chi Square Value (.05)	45.79					**Nonparametric Statistics**	
4251				Adjusted Level of Significance	0.0324					95% CLT UCL	0.0506
4252				Adjusted Chi Square Value	43.98					95% Jackknife UCL	0.0514
4253										95% Standard Bootstrap UCL	0.0501
4254				Anderson-Darling Test Statistic	0.621					95% Bootstrap-t UCL	0.068
4255				Anderson-Darling 5% Critical Value	0.746					95% Hall's Bootstrap UCL	0.117
4256				Kolmogorov-Smirnov Test Statistic	0.188					95% Percentile Bootstrap UCL	0.0513
4257				Kolmogorov-Smirnov 5% Critical Value	0.224					95% BCA Bootstrap UCL	0.0547
4258				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.0714
4259										97.5% Chebyshev(Mean, Sd) UCL	0.0859
4260				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.114
4261				95% Approximate Gamma UCL	0.0522						
4262				95% Adjusted Gamma UCL	0.0544						
4263											
4264				**Potential UCL to Use**						Use 95% Approximate Gamma UCL	0.0522
4265											
4266											
4267	**Zinc, dissolved (pge-8)**										
4268											
4269				**General Statistics**							
4270				Number of Valid Observations	17					Number of Distinct Observations	16
4271											
4272				**Raw Statistics**						**Log-transformed Statistics**	
4273				Minimum	0.015					Minimum of Log Data	-4.2
4274				Maximum	0.82					Maximum of Log Data	-0.198
4275				Mean	0.177					Mean of log Data	-2.496
4276				Median	0.08					SD of log Data	1.271
4277				SD	0.24						
4278				Coefficient of Variation	1.357						
4279				Skewness	1.974						
4280											
4281				**Relevant UCL Statistics**							
4282				**Normal Distribution Test**						**Lognormal Distribution Test**	
4283				Shapiro Wilk Test Statistic	0.692					Shapiro Wilk Test Statistic	0.938
4284				Shapiro Wilk Critical Value	0.892					Shapiro Wilk Critical Value	0.892
4285				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**	
4286											
4287				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**	
4288				95% Student's-t UCL	0.279					95% H-UCL	0.494
4289				**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL	0.434
4290				95% Adjusted-CLT UCL	0.303					97.5% Chebyshev (MVUE) UCL	0.547
4291				95% Modified-t UCL	0.283					99% Chebyshev (MVUE) UCL	0.77
4292											
4293				**Gamma Distribution Test**						**Data Distribution**	

4294					k star (bias corrected)	0.681		**Data appear Gamma Distributed at 5% Significance Level**				
4295					Theta Star	0.26						
4296					nu star	23.17						
4297					Approximate Chi Square Value (.05)	13.22		**Nonparametric Statistics**				
4298					Adjusted Level of Significance	0.0346					95% CLT UCL	0.273
4299					Adjusted Chi Square Value	12.43					95% Jackknife UCL	0.279
4300											95% Standard Bootstrap UCL	0.27
4301					Anderson-Darling Test Statistic	0.733					95% Bootstrap-t UCL	0.39
4302					Anderson-Darling 5% Critical Value	0.775					95% Hall's Bootstrap UCL	0.65
4303					Kolmogorov-Smirnov Test Statistic	0.186					95% Percentile Bootstrap UCL	0.274
4304					Kolmogorov-Smirnov 5% Critical Value	0.217					95% BCA Bootstrap UCL	0.315
4305					**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.431
4306											97.5% Chebyshev(Mean, Sd) UCL	0.541
4307					**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.757
4308					95% Approximate Gamma UCL	0.31						
4309					95% Adjusted Gamma UCL	0.33						
4310												
4311					**Potential UCL to Use**						Use 95% Approximate Gamma UCL	0.31
4312												
4313												
4314	**Zinc, dissolved (tw-1)**											
4315												
4316					**General Statistics**							
4317					Number of Valid Observations	4					Number of Distinct Observations	4
4318												
4319												
4320					**Warning: This data set only has 4 observations!**							
4321					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
4322					**The data set for variable Zinc, dissolved (tw-1) was not processed!**							
4323												
4324					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
4325					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
4326												
4327												
4328												
4329	**Zinc, dissolved (tw-2d)**											
4330												
4331					**General Statistics**							
4332					Number of Valid Observations	3					Number of Distinct Observations	3
4333												
4334												
4335					**Warning: This data set only has 3 observations!**							
4336					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
4337					**The data set for variable Zinc, dissolved (tw-2d) was not processed!**							
4338												
4339					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
4340					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
4341												
4342												
4343												
4344	**Zinc, dissolved (tw-2s)**											
4345												
4346					**General Statistics**							

	A	B	C	D	E	F	G	H	I	J	K	L
4347					Number of Valid Data	3				Number of Detected Data		2
4348					Number of Distinct Detected Data	2				Number of Non-Detect Data		1
4349										Percent Non-Detects		33.33%
4350												
4351						**Warning: This data set only has 3 observations!**						
4352						**Data set is too small to compute reliable and meaningful statistics and estimates!**						
4353						**The data set for variable Zinc, dissolved (tw-2s) was not processed!**						
4354												
4355						**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**						
4356						**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
4357												
4358												

ARCADIS

Well-Specific

Quantile Outputs

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Arsenic, dissolved(mw-12)

Background Data: Arsenic, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	132
Number of Non-Detect Data	0	3
Number of Detect Data	17	129
Minimum Non-Detect	N/A	0.001
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	2.27%
Minimum Detected	0.052	0.00107
Maximum Detected	0.157	0.0191
Mean of Detected Data	0.0921	0.00598
Median of Detected Data	0.0819	0.0054
SD of Detected Data	0.0318	0.00389

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0345

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Barium, dissolved(mw-11)

Background Data: Barium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	3	0
Number of Detect Data	11	149
Minimum Non-Detect	0.3	N/A
Maximum Non-Detect	0.5	N/A
Percent Non detects	21.43%	0.00%
Minimum Detected	0.028	0.0115
Maximum Detected	0.22	0.188
Mean of Detected Data	0.056	0.06
Median of Detected Data	0.0398	0.0488
SD of Detected Data	0.0546	0.0381

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Cobalt, dissolved(mw-34-80)

Background Data: Cobalt, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	8	145
Number of Detect Data	5	4
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.005	0.001
Percent Non detects	61.54%	97.32%
Minimum Detected	0.00108	0.00101
Maximum Detected	0.00139	0.00164
Mean of Detected Data	0.00125	0.00136
Median of Detected Data	0.00123	0.00139
SD of Detected Data	0.0001203	0.0002611

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Copper, dissolved(mw-9)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	10	45
Number of Detect Data	17	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0555	0.00325
Percent Non detects	37.04%	30.20%
Minimum Detected	0.0024	0.00101
Maximum Detected	0.0167	0.0205
Mean of Detected Data	0.00672	0.00417
Median of Detected Data	0.0052	0.00318
SD of Detected Data	0.00447	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-10)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	39	149
Number of Non-Detect Data	23	45
Number of Detect Data	16	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.02	0.00325
Percent Non detects	58.97%	30.20%
Minimum Detected	0.00118	0.00101
Maximum Detected	0.026	0.0205
Mean of Detected Data	0.00493	0.00417
Median of Detected Data	0.0031	0.00318
SD of Detected Data	0.00595	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-11)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	35	149
Number of Non-Detect Data	23	45
Number of Detect Data	12	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	65.71%	30.20%
Minimum Detected	0.00122	0.00101
Maximum Detected	0.019	0.0205
Mean of Detected Data	0.00543	0.00417
Median of Detected Data	0.0038	0.00318
SD of Detected Data	0.00494	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Copper, dissolved(mw-12)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	41	149
Number of Non-Detect Data	27	45
Number of Detect Data	14	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	65.85%	30.20%
Minimum Detected	0.0013	0.00101
Maximum Detected	0.018	0.0205
Mean of Detected Data	0.00577	0.00417
Median of Detected Data	0.00412	0.00318
SD of Detected Data	0.00419	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Copper, dissolved(mw-13)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	16	45
Number of Detect Data	11	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	59.26%	30.20%
Minimum Detected	0.0016	0.00101
Maximum Detected	0.011	0.0205
Mean of Detected Data	0.00599	0.00417
Median of Detected Data	0.0053	0.00318
SD of Detected Data	0.0033	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-14)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	149
Number of Non-Detect Data	14	45
Number of Detect Data	12	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.02	0.00325
Percent Non detects	53.85%	30.20%
Minimum Detected	0.00348	0.00101
Maximum Detected	0.0297	0.0205
Mean of Detected Data	0.00757	0.00417
Median of Detected Data	0.0045	0.00318
SD of Detected Data	0.0074	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-15)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	24	149
Number of Non-Detect Data	17	45
Number of Detect Data	7	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	70.83%	30.20%
Minimum Detected	0.00111	0.00101
Maximum Detected	0.019	0.0205
Mean of Detected Data	0.00903	0.00417
Median of Detected Data	0.0072	0.00318
SD of Detected Data	0.00582	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-19)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	16	45
Number of Detect Data	6	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	72.73%	30.20%
Minimum Detected	0.0016	0.00101
Maximum Detected	0.0126	0.0205
Mean of Detected Data	0.00595	0.00417
Median of Detected Data	0.0053	0.00318
SD of Detected Data	0.00387	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-20-70)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	36	149
Number of Non-Detect Data	20	45
Number of Detect Data	16	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	55.56%	30.20%
Minimum Detected	0.00107	0.00101
Maximum Detected	0.0785	0.0205
Mean of Detected Data	0.00977	0.00417
Median of Detected Data	0.0039	0.00318
SD of Detected Data	0.0189	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-20-100)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	13	45
Number of Detect Data	10	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	56.52%	30.20%
Minimum Detected	0.002	0.00101
Maximum Detected	0.05	0.0205
Mean of Detected Data	0.0107	0.00417
Median of Detected Data	0.00645	0.00318
SD of Detected Data	0.0145	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
R Value Adjusted for Ties in Data	6
K Value Adjusted for Ties in Data	4
Number of Site Observations in 'R' Largest	4

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-20-130)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	149
Number of Non-Detect Data	24	45
Number of Detect Data	10	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	70.59%	30.20%
Minimum Detected	0.00162	0.00101
Maximum Detected	0.1	0.0205
Mean of Detected Data	0.0156	0.00417
Median of Detected Data	0.00615	0.00318
SD of Detected Data	0.0299	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-21)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	149
Number of Non-Detect Data	8	45
Number of Detect Data	17	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	32.00%	30.20%
Minimum Detected	0.0047	0.00101
Maximum Detected	0.111	0.0205
Mean of Detected Data	0.0221	0.00417
Median of Detected Data	0.0095	0.00318
SD of Detected Data	0.0269	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Copper, dissolved(mw-22)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	13	45
Number of Detect Data	14	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	48.15%	30.20%
Minimum Detected	0.0033	0.00101
Maximum Detected	0.2	0.0205
Mean of Detected Data	0.0325	0.00417
Median of Detected Data	0.0068	0.00318
SD of Detected Data	0.0613	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	4

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-23)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	149
Number of Non-Detect Data	16	45
Number of Detect Data	10	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	61.54%	30.20%
Minimum Detected	0.0031	0.00101
Maximum Detected	0.1	0.0205
Mean of Detected Data	0.0194	0.00417
Median of Detected Data	0.0058	0.00318
SD of Detected Data	0.0313	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-24a)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	149
Number of Non-Detect Data	15	45
Number of Detect Data	10	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.02	0.00325
Percent Non detects	60.00%	30.20%
Minimum Detected	0.0027	0.00101
Maximum Detected	0.076	0.0205
Mean of Detected Data	0.0133	0.00417
Median of Detected Data	0.00565	0.00318
SD of Detected Data	0.0223	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-24b)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	15	45
Number of Detect Data	8	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	65.22%	30.20%
Minimum Detected	0.0026	0.00101
Maximum Detected	0.019	0.0205
Mean of Detected Data	0.00694	0.00417
Median of Detected Data	0.00415	0.00318
SD of Detected Data	0.00598	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-24br)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	14	45
Number of Detect Data	8	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	63.64%	30.20%
Minimum Detected	0.0025	0.00101
Maximum Detected	0.0655	0.0205
Mean of Detected Data	0.0173	0.00417
Median of Detected Data	0.00585	0.00318
SD of Detected Data	0.0227	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
R Value Adjusted for Ties in Data	7
K Value Adjusted for Ties in Data	4
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-25)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	29	149
Number of Non-Detect Data	22	45
Number of Detect Data	7	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	75.86%	30.20%
Minimum Detected	0.00134	0.00101
Maximum Detected	0.02	0.0205
Mean of Detected Data	0.00813	0.00417
Median of Detected Data	0.0071	0.00318
SD of Detected Data	0.00623	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.052)	2
Approximate K Value (0.052)	2
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Copper, dissolved(mw-26)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	149
Number of Non-Detect Data	12	45
Number of Detect Data	13	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.0278	0.00325
Percent Non detects	48.00%	30.20%
Minimum Detected	0.0037	0.00101
Maximum Detected	0.0342	0.0205
Mean of Detected Data	0.00856	0.00417
Median of Detected Data	0.0059	0.00318
SD of Detected Data	0.00845	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Copper, dissolved(mw-27-20)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	11	45
Number of Detect Data	11	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.02	0.00325
Percent Non detects	50.00%	30.20%
Minimum Detected	0.0033	0.00101
Maximum Detected	0.0961	0.0205
Mean of Detected Data	0.016	0.00417
Median of Detected Data	0.0075	0.00318
SD of Detected Data	0.027	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	4

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Copper, dissolved(mw-28-25)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	21	149
Number of Non-Detect Data	11	45
Number of Detect Data	10	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.02	0.00325
Percent Non detects	52.38%	30.20%
Minimum Detected	0.0032	0.00101
Maximum Detected	0.0269	0.0205
Mean of Detected Data	0.00818	0.00417
Median of Detected Data	0.0046	0.00318
SD of Detected Data	0.00757	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-29)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	10	45
Number of Detect Data	12	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	45.45%	30.20%
Minimum Detected	0.0031	0.00101
Maximum Detected	0.0187	0.0205
Mean of Detected Data	0.00875	0.00417
Median of Detected Data	0.0092	0.00318
SD of Detected Data	0.00511	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(mw-30-30)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	11	45
Number of Detect Data	11	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	50.00%	30.20%
Minimum Detected	0.0023	0.00101
Maximum Detected	0.2	0.0205
Mean of Detected Data	0.0252	0.00417
Median of Detected Data	0.0069	0.00318
SD of Detected Data	0.0583	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
R Value Adjusted for Ties in Data	8
K Value Adjusted for Ties in Data	5
Number of Site Observations in 'R' Largest	6

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Copper, dissolved(mw-31-60)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	16	45
Number of Detect Data	7	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	69.57%	30.20%
Minimum Detected	0.0037	0.00101
Maximum Detected	0.05	0.0205
Mean of Detected Data	0.0197	0.00417
Median of Detected Data	0.01	0.00318
SD of Detected Data	0.0189	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(ow-5m)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	9	45
Number of Detect Data	5	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.01	0.00325
Percent Non detects	64.29%	30.20%
Minimum Detected	0.0016	0.00101
Maximum Detected	0.0114	0.0205
Mean of Detected Data	0.00654	0.00417
Median of Detected Data	0.0058	0.00318
SD of Detected Data	0.00434	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	0
Calculated Alpha	0.0196

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(pge-6)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	7	45
Number of Detect Data	10	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.011	0.00325
Percent Non detects	41.18%	30.20%
Minimum Detected	0.0034	0.00101
Maximum Detected	0.047	0.0205
Mean of Detected Data	0.0126	0.00417
Median of Detected Data	0.006	0.00318
SD of Detected Data	0.0137	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0.028

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Fluoride(cw-2d)

Background Data: Fluoride(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	143
Number of Non-Detect Data	1	25
Number of Detect Data	7	118
Minimum Non-Detect	5	0.5
Maximum Non-Detect	5	0.5
Percent Non detects	12.50%	17.48%
Minimum Detected	0.982	0.525
Maximum Detected	7.26	4.34
Mean of Detected Data	3.025	1.698
Median of Detected Data	3.26	1.525
SD of Detected Data	2.165	1.024

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-9)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	35	148
Number of Non-Detect Data	0	38
Number of Detect Data	35	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.265	0.00022
Maximum Detected	0.402	0.0376
Mean of Detected Data	0.339	0.0102
Median of Detected Data	0.343	0.00885
SD of Detected Data	0.0285	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-10)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	37	148
Number of Non-Detect Data	0	38
Number of Detect Data	37	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.755	0.00022
Maximum Detected	4.57	0.0376
Mean of Detected Data	1.838	0.0102
Median of Detected Data	1.87	0.00885
SD of Detected Data	0.699	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-11)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	148
Number of Non-Detect Data	0	38
Number of Detect Data	34	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.02	0.00022
Maximum Detected	1.71	0.0376
Mean of Detected Data	0.599	0.0102
Median of Detected Data	0.465	0.00885
SD of Detected Data	0.348	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-12)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	40	148
Number of Non-Detect Data	0	38
Number of Detect Data	40	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.311	0.00022
Maximum Detected	2.97	0.0376
Mean of Detected Data	1.155	0.0102
Median of Detected Data	1.005	0.00885
SD of Detected Data	0.649	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
Number of Site Observations in 'R' Largest	6
Calculated Alpha	N/A

Conclusion with Alpha = 0.056

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-14)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	37	148
Number of Non-Detect Data	1	38
Number of Detect Data	36	110
Minimum Non-Detect	0.01	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	2.70%	25.68%
Minimum Detected	0.01	0.00022
Maximum Detected	0.099	0.0376
Mean of Detected Data	0.0334	0.0102
Median of Detected Data	0.032	0.00885
SD of Detected Data	0.015	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Hexavalent chromium(mw-15)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	32	148
Number of Non-Detect Data	9	38
Number of Detect Data	23	110
Minimum Non-Detect	0.01	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	28.13%	25.68%
Minimum Detected	0.0076	0.00022
Maximum Detected	0.05	0.0376
Mean of Detected Data	0.0156	0.0102
Median of Detected Data	0.0121	0.00885
SD of Detected Data	0.00993	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.052)	2
Approximate K Value (0.052)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	N/A

Conclusion with Alpha = 0.052

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-19)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	148
Number of Non-Detect Data	0	38
Number of Detect Data	34	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.557	0.00022
Maximum Detected	1.39	0.0376
Mean of Detected Data	0.839	0.0102
Median of Detected Data	0.756	0.00885
SD of Detected Data	0.21	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-20-70)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	39	148
Number of Non-Detect Data	0	38
Number of Detect Data	39	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	2.4	0.00022
Maximum Detected	13.2	0.0376
Mean of Detected Data	8.776	0.0102
Median of Detected Data	9	0.00885
SD of Detected Data	3.252	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
Number of Site Observations in 'R' Largest	6
Calculated Alpha	N/A

Conclusion with Alpha = 0.056

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-20-100)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	37	148
Number of Non-Detect Data	0	38
Number of Detect Data	37	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	1.35	0.00022
Maximum Detected	10.4	0.0376
Mean of Detected Data	5.12	0.0102
Median of Detected Data	3.09	0.00885
SD of Detected Data	3.186	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-20-130)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	38	148
Number of Non-Detect Data	0	38
Number of Detect Data	38	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	3.66	0.00022
Maximum Detected	14.4	0.0376
Mean of Detected Data	7.772	0.0102
Median of Detected Data	6.595	0.00885
SD of Detected Data	2.743	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
Number of Site Observations in 'R' Largest	6
Calculated Alpha	N/A

Conclusion with Alpha = 0.056

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-23)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	36	148
Number of Non-Detect Data	22	38
Number of Detect Data	14	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	61.11%	25.68%
Minimum Detected	0.0011	0.00022
Maximum Detected	1.02	0.0376
Mean of Detected Data	0.0838	0.0102
Median of Detected Data	0.0125	0.00885
SD of Detected Data	0.27	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	1
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-24a)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	32	148
Number of Non-Detect Data	0	38
Number of Detect Data	32	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	2.48	0.00022
Maximum Detected	4.3	0.0376
Mean of Detected Data	3.236	0.0102
Median of Detected Data	3.26	0.00885
SD of Detected Data	0.415	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.052)	2
Approximate K Value (0.052)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	N/A

Conclusion with Alpha = 0.052

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-24b)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	148
Number of Non-Detect Data	0	38
Number of Detect Data	34	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.741	0.00022
Maximum Detected	6.12	0.0376
Mean of Detected Data	4.617	0.0102
Median of Detected Data	4.81	0.00885
SD of Detected Data	1.044	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-25)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	33	148
Number of Non-Detect Data	0	38
Number of Detect Data	33	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.933	0.00022
Maximum Detected	2.98	0.0376
Mean of Detected Data	2.186	0.0102
Median of Detected Data	2.35	0.00885
SD of Detected Data	0.598	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Hexavalent chromium(mw-26)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	35	148
Number of Non-Detect Data	1	38
Number of Detect Data	34	110
Minimum Non-Detect	0.01	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	2.86%	25.68%
Minimum Detected	0.759	0.00022
Maximum Detected	4.06	0.0376
Mean of Detected Data	3.027	0.0102
Median of Detected Data	3.385	0.00885
SD of Detected Data	0.981	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-30-50)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	45	148
Number of Non-Detect Data	11	38
Number of Detect Data	34	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.001	0.001
Percent Non detects	24.44%	25.68%
Minimum Detected	0.0185	0.00022
Maximum Detected	3.76	0.0376
Mean of Detected Data	1.419	0.0102
Median of Detected Data	1.57	0.00885
SD of Detected Data	0.907	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.049)	10
Approximate K Value (0.049)	6
Number of Site Observations in 'R' Largest	10
Calculated Alpha	N/A

Conclusion with Alpha = 0.049

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-31-60)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	36	148
Number of Non-Detect Data	0	38
Number of Detect Data	36	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.626	0.00022
Maximum Detected	4.52	0.0376
Mean of Detected Data	3.028	0.0102
Median of Detected Data	3.59	0.00885
SD of Detected Data	1.172	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-31-135)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	148
Number of Non-Detect Data	0	38
Number of Detect Data	14	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0332	0.00022
Maximum Detected	0.422	0.0376
Mean of Detected Data	0.221	0.0102
Median of Detected Data	0.244	0.00885
SD of Detected Data	0.133	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0199

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-34-80)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	88	148
Number of Non-Detect Data	75	38
Number of Detect Data	13	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	85.23%	25.68%
Minimum Detected	0.00086	0.00022
Maximum Detected	0.111	0.0376
Mean of Detected Data	0.0248	0.0102
Median of Detected Data	0.0073	0.00885
SD of Detected Data	0.036	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.049)	4
Approximate K Value (0.049)	4
Number of Site Observations in 'R' Largest	3
Calculated Alpha	N/A

Conclusion with Alpha = 0.049

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-34-100)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	79	148
Number of Non-Detect Data	0	38
Number of Detect Data	79	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0739	0.00022
Maximum Detected	0.976	0.0376
Mean of Detected Data	0.679	0.0102
Median of Detected Data	0.723	0.00885
SD of Detected Data	0.177	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.042)	9
Approximate K Value (0.042)	7
Number of Site Observations in 'R' Largest	9
Calculated Alpha	N/A

Conclusion with Alpha = 0.042

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-35-60)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	148
Number of Non-Detect Data	0	38
Number of Detect Data	13	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0048	0.00022
Maximum Detected	0.0351	0.0376
Mean of Detected Data	0.0274	0.0102
Median of Detected Data	0.0286	0.00885
SD of Detected Data	0.0081	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0173

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-35-135)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	148
Number of Non-Detect Data	1	38
Number of Detect Data	13	110
Minimum Non-Detect	0.00075	0.0002
Maximum Non-Detect	0.00075	0.001
Percent Non detects	7.14%	25.68%
Minimum Detected	0.0079	0.00022
Maximum Detected	0.0354	0.0376
Mean of Detected Data	0.023	0.0102
Median of Detected Data	0.023	0.00885
SD of Detected Data	0.00832	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0199

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-36-90)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	39	148
Number of Non-Detect Data	1	38
Number of Detect Data	38	110
Minimum Non-Detect	0.001	0.0002
Maximum Non-Detect	0.001	0.001
Percent Non detects	2.56%	25.68%
Minimum Detected	0.002	0.00022
Maximum Detected	3.66	0.0376
Mean of Detected Data	0.73	0.0102
Median of Detected Data	0.0524	0.00885
SD of Detected Data	1.16	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
Number of Site Observations in 'R' Largest	6
Calculated Alpha	N/A

Conclusion with Alpha = 0.056

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-36-100)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	51	148
Number of Non-Detect Data	0	38
Number of Detect Data	51	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.157	0.00022
Maximum Detected	2.98	0.0376
Mean of Detected Data	1.027	0.0102
Median of Detected Data	0.556	0.00885
SD of Detected Data	0.859	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.043)	5
Approximate K Value (0.043)	4
Number of Site Observations in 'R' Largest	5
Calculated Alpha	N/A

Conclusion with Alpha = 0.043

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-37d)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	148
Number of Non-Detect Data	0	38
Number of Detect Data	15	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.834	0.00022
Maximum Detected	1.97	0.0376
Mean of Detected Data	1.417	0.0102
Median of Detected Data	1.39	0.00885
SD of Detected Data	0.348	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0226

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-38d)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	11	148
Number of Non-Detect Data	0	38
Number of Detect Data	11	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0331	0.00022
Maximum Detected	0.328	0.0376
Mean of Detected Data	0.164	0.0102
Median of Detected Data	0.111	0.00885
SD of Detected Data	0.1	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-38s)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	11	148
Number of Non-Detect Data	0	38
Number of Detect Data	11	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.332	0.00022
Maximum Detected	0.964	0.0376
Mean of Detected Data	0.781	0.0102
Median of Detected Data	0.824	0.00885
SD of Detected Data	0.191	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-39-50)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	18	148
Number of Non-Detect Data	6	38
Number of Detect Data	12	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	33.33%	25.68%
Minimum Detected	0.0662	0.00022
Maximum Detected	4.14	0.0376
Mean of Detected Data	1.61	0.0102
Median of Detected Data	1.235	0.00885
SD of Detected Data	1.394	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	6
Calculated Alpha	0.0176

Conclusion with Alpha = 0.057

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Hexavalent chromium(mw-39-60)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	18	148
Number of Non-Detect Data	2	38
Number of Detect Data	16	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.001	0.001
Percent Non detects	11.11%	25.68%
Minimum Detected	0.0011	0.00022
Maximum Detected	3.81	0.0376
Mean of Detected Data	1.61	0.0102
Median of Detected Data	1.545	0.00885
SD of Detected Data	1.435	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	6
Calculated Alpha	0.0176

Conclusion with Alpha = 0.057

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-39-70)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	148
Number of Non-Detect Data	0	38
Number of Detect Data	27	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0045	0.00022
Maximum Detected	8.21	0.0376
Mean of Detected Data	2.336	0.0102
Median of Detected Data	0.799	0.00885
SD of Detected Data	2.851	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5
Calculated Alpha	0

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-39-80)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	40	148
Number of Non-Detect Data	0	38
Number of Detect Data	40	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0433	0.00022
Maximum Detected	10.9	0.0376
Mean of Detected Data	3.033	0.0102
Median of Detected Data	1.585	0.00885
SD of Detected Data	3.448	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
Number of Site Observations in 'R' Largest	6
Calculated Alpha	N/A

Conclusion with Alpha = 0.056

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-39-100)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	41	148
Number of Non-Detect Data	0	38
Number of Detect Data	41	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	1.66	0.00022
Maximum Detected	12.9	0.0376
Mean of Detected Data	5.536	0.0102
Median of Detected Data	4.01	0.00885
SD of Detected Data	3.428	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
Number of Site Observations in 'R' Largest	6
Calculated Alpha	N/A

Conclusion with Alpha = 0.056

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-40d)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	148
Number of Non-Detect Data	0	38
Number of Detect Data	15	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0076	0.00022
Maximum Detected	0.112	0.0376
Mean of Detected Data	0.068	0.0102
Median of Detected Data	0.078	0.00885
SD of Detected Data	0.0336	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
R Value Adjusted for Ties in Data	4
K Value Adjusted for Ties in Data	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	0.0226

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-44-115)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	32	148
Number of Non-Detect Data	0	38
Number of Detect Data	32	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.62	0.00022
Maximum Detected	1.71	0.0376
Mean of Detected Data	1.255	0.0102
Median of Detected Data	1.27	0.00885
SD of Detected Data	0.302	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.052)	2
Approximate K Value (0.052)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	N/A

Conclusion with Alpha = 0.052

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-44-125)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	29	148
Number of Non-Detect Data	0	38
Number of Detect Data	29	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.157	0.00022
Maximum Detected	0.634	0.0376
Mean of Detected Data	0.339	0.0102
Median of Detected Data	0.3	0.00885
SD of Detected Data	0.122	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.052)	2
Approximate K Value (0.052)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	N/A

Conclusion with Alpha = 0.052

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-46-175)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	29	148
Number of Non-Detect Data	0	38
Number of Detect Data	29	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0779	0.00022
Maximum Detected	0.287	0.0376
Mean of Detected Data	0.159	0.0102
Median of Detected Data	0.153	0.00885
SD of Detected Data	0.0548	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.052)	2
Approximate K Value (0.052)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	N/A

Conclusion with Alpha = 0.052

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-47-55)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	38
Number of Detect Data	8	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0109	0.00022
Maximum Detected	0.0619	0.0376
Mean of Detected Data	0.0418	0.0102
Median of Detected Data	0.0447	0.00885
SD of Detected Data	0.0194	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-50-095)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	38
Number of Detect Data	8	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.164	0.00022
Maximum Detected	0.304	0.0376
Mean of Detected Data	0.241	0.0102
Median of Detected Data	0.246	0.00885
SD of Detected Data	0.0482	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(mw-50-200)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	38
Number of Detect Data	8	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	5.81	0.00022
Maximum Detected	12.3	0.0376
Mean of Detected Data	9.556	0.0102
Median of Detected Data	9.88	0.00885
SD of Detected Data	1.994	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Hexavalent chromium(ow-2s)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	148
Number of Non-Detect Data	1	38
Number of Detect Data	15	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.0002	0.001
Percent Non detects	6.25%	25.68%
Minimum Detected	0.0153	0.00022
Maximum Detected	0.0404	0.0376
Mean of Detected Data	0.0318	0.0102
Median of Detected Data	0.0348	0.00885
SD of Detected Data	0.00736	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0.0254

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Hexavalent chromium(ow-5s)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	148
Number of Non-Detect Data	0	38
Number of Detect Data	16	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0223	0.00022
Maximum Detected	0.0326	0.0376
Mean of Detected Data	0.0255	0.0102
Median of Detected Data	0.0254	0.00885
SD of Detected Data	0.00254	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	0
Calculated Alpha	0.0254

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Hexavalent chromium(pe-1)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	24	148
Number of Non-Detect Data	3	38
Number of Detect Data	21	110
Minimum Non-Detect	0.001	0.0002
Maximum Non-Detect	0.001	0.001
Percent Non detects	12.50%	25.68%
Minimum Detected	0.0471	0.00022
Maximum Detected	0.148	0.0376
Mean of Detected Data	0.0941	0.0102
Median of Detected Data	0.0925	0.00885
SD of Detected Data	0.0321	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5
Calculated Alpha	0

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(pge-6)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	18	148
Number of Non-Detect Data	5	38
Number of Detect Data	13	110
Minimum Non-Detect	0.01	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	27.78%	25.68%
Minimum Detected	0.16	0.00022
Maximum Detected	3.1	0.0376
Mean of Detected Data	1.072	0.0102
Median of Detected Data	0.787	0.00885
SD of Detected Data	0.86	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	6
Calculated Alpha	0.0176

Conclusion with Alpha = 0.057

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(pge-7)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	148
Number of Non-Detect Data	1	38
Number of Detect Data	15	110
Minimum Non-Detect	0.001	0.0002
Maximum Non-Detect	0.001	0.001
Percent Non detects	6.25%	25.68%
Minimum Detected	0.827	0.00022
Maximum Detected	5.4	0.0376
Mean of Detected Data	4.208	0.0102
Median of Detected Data	4.53	0.00885
SD of Detected Data	1.22	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0254

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(tw-2d)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	12	148
Number of Non-Detect Data	0	38
Number of Detect Data	12	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.21	0.00022
Maximum Detected	7.41	0.0376
Mean of Detected Data	3.243	0.0102
Median of Detected Data	1.805	0.00885
SD of Detected Data	2.595	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(tw-2s)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	10	148
Number of Non-Detect Data	0	38
Number of Detect Data	10	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	1.25	0.00022
Maximum Detected	7.19	0.0376
Mean of Detected Data	3.792	0.0102
Median of Detected Data	3.57	0.00885
SD of Detected Data	1.854	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(tw-3d)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	148
Number of Non-Detect Data	0	38
Number of Detect Data	22	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	1.93	0.00022
Maximum Detected	4.33	0.0376
Mean of Detected Data	2.634	0.0102
Median of Detected Data	2.495	0.00885
SD of Detected Data	0.553	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	6
Calculated Alpha	0.0293

Conclusion with Alpha = 0.057

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Lead, dissolved(mw-10)

Background Data: Lead, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	147
Number of Non-Detect Data	11	125
Number of Detect Data	6	22
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.005	0.001
Percent Non detects	64.71%	85.03%
Minimum Detected	0.00106	0.00102
Maximum Detected	0.008	0.00409
Mean of Detected Data	0.00255	0.00199
Median of Detected Data	0.00153	0.00162
SD of Detected Data	0.00269	0.0009179

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
R Value Adjusted for Ties in Data	5
K Value Adjusted for Ties in Data	4
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(cw-1d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	149
Number of Non-Detect Data	0	1
Number of Detect Data	8	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.012	0.0035
Maximum Detected	0.0518	0.0417
Mean of Detected Data	0.0303	0.0113
Median of Detected Data	0.03	0.00866
SD of Detected Data	0.0151	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Molybdenum, dissolved(cw-2d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	149
Number of Non-Detect Data	0	1
Number of Detect Data	8	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0339	0.0035
Maximum Detected	0.0732	0.0417
Mean of Detected Data	0.0527	0.0113
Median of Detected Data	0.051	0.00866
SD of Detected Data	0.0128	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(cw-3d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	149
Number of Non-Detect Data	0	1
Number of Detect Data	8	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0292	0.0035
Maximum Detected	0.0882	0.0417
Mean of Detected Data	0.0522	0.0113
Median of Detected Data	0.0555	0.00866
SD of Detected Data	0.0196	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(cw-3m)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	149
Number of Non-Detect Data	0	1
Number of Detect Data	8	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0154	0.0035
Maximum Detected	0.0378	0.0417
Mean of Detected Data	0.0248	0.0113
Median of Detected Data	0.0225	0.00866
SD of Detected Data	0.00748	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	0
Calculated Alpha	1

Conclusion with Alpha = 0

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(cw-4d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	149
Number of Non-Detect Data	0	1
Number of Detect Data	8	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0218	0.0035
Maximum Detected	0.0442	0.0417
Mean of Detected Data	0.0365	0.0113
Median of Detected Data	0.0391	0.00866
SD of Detected Data	0.00833	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(mw-3)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	12	149
Number of Non-Detect Data	1	1
Number of Detect Data	11	148
Minimum Non-Detect	0.05	0.00758
Maximum Non-Detect	0.05	0.00758
Percent Non detects	8.33%	0.67%
Minimum Detected	0.025	0.0035
Maximum Detected	0.041	0.0417
Mean of Detected Data	0.0314	0.0113
Median of Detected Data	0.0293	0.00866
SD of Detected Data	0.00509	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(mw-5)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	12	149
Number of Non-Detect Data	1	1
Number of Detect Data	11	148
Minimum Non-Detect	0.05	0.00758
Maximum Non-Detect	0.05	0.00758
Percent Non detects	8.33%	0.67%
Minimum Detected	0.039	0.0035
Maximum Detected	0.15	0.0417
Mean of Detected Data	0.0528	0.0113
Median of Detected Data	0.041	0.00866
SD of Detected Data	0.0326	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Molybdenum, dissolved(mw-10)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	0	1
Number of Detect Data	17	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0683	0.0035
Maximum Detected	0.301	0.0417
Mean of Detected Data	0.14	0.0113
Median of Detected Data	0.122	0.00866
SD of Detected Data	0.0607	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.028

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(mw-12)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	20	149
Number of Non-Detect Data	0	1
Number of Detect Data	20	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.019	0.0035
Maximum Detected	0.087	0.0417
Mean of Detected Data	0.0461	0.0113
Median of Detected Data	0.041	0.00866
SD of Detected Data	0.0212	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	6
Calculated Alpha	0.0227

Conclusion with Alpha = 0.057

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(mw-20-130)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	149
Number of Non-Detect Data	0	1
Number of Detect Data	15	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.018	0.0035
Maximum Detected	0.0576	0.0417
Mean of Detected Data	0.0435	0.0113
Median of Detected Data	0.0455	0.00866
SD of Detected Data	0.0094	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0223

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(mw-37d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	0	1
Number of Detect Data	13	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.034	0.0035
Maximum Detected	0.0518	0.0417
Mean of Detected Data	0.0444	0.0113
Median of Detected Data	0.0455	0.00866
SD of Detected Data	0.00582	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0171

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Molybdenum, dissolved(ow-1d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	0	1
Number of Detect Data	17	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0088	0.0035
Maximum Detected	0.0518	0.0417
Mean of Detected Data	0.0267	0.0113
Median of Detected Data	0.0262	0.00866
SD of Detected Data	0.0133	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.028

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(ow-2d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	149
Number of Non-Detect Data	0	1
Number of Detect Data	16	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0082	0.0035
Maximum Detected	0.0665	0.0417
Mean of Detected Data	0.0205	0.0113
Median of Detected Data	0.0127	0.00866
SD of Detected Data	0.0191	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0251

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(ow-2s)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	149
Number of Non-Detect Data	0	1
Number of Detect Data	15	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.029	0.0035
Maximum Detected	0.0893	0.0417
Mean of Detected Data	0.0414	0.0113
Median of Detected Data	0.0383	0.00866
SD of Detected Data	0.0144	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0223

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(ow-5d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	149
Number of Non-Detect Data	0	1
Number of Detect Data	16	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0118	0.0035
Maximum Detected	0.0838	0.0417
Mean of Detected Data	0.0349	0.0113
Median of Detected Data	0.0316	0.00866
SD of Detected Data	0.0226	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0251

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(ow-5m)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	149
Number of Non-Detect Data	0	1
Number of Detect Data	16	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0098	0.0035
Maximum Detected	0.0501	0.0417
Mean of Detected Data	0.0266	0.0113
Median of Detected Data	0.0255	0.00866
SD of Detected Data	0.0115	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0.0251

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Nickel, dissolved(mw-9)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	12	96
Number of Detect Data	15	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	44.44%	64.43%
Minimum Detected	0.0014	0.001
Maximum Detected	0.0297	0.0415
Mean of Detected Data	0.00675	0.0042
Median of Detected Data	0.003	0.00202
SD of Detected Data	0.00784	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	4

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-10)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	39	149
Number of Non-Detect Data	19	96
Number of Detect Data	20	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	48.72%	64.43%
Minimum Detected	0.00165	0.001
Maximum Detected	0.033	0.0415
Mean of Detected Data	0.00592	0.0042
Median of Detected Data	0.0034	0.00202
SD of Detected Data	0.0074	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-11)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	35	149
Number of Non-Detect Data	19	96
Number of Detect Data	16	53
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	54.29%	64.43%
Minimum Detected	0.00096	0.001
Maximum Detected	0.0203	0.0415
Mean of Detected Data	0.00689	0.0042
Median of Detected Data	0.0053	0.00202
SD of Detected Data	0.00579	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-12)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	41	149
Number of Non-Detect Data	21	96
Number of Detect Data	20	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	51.22%	64.43%
Minimum Detected	0.0013	0.001
Maximum Detected	0.0179	0.0415
Mean of Detected Data	0.00552	0.0042
Median of Detected Data	0.00386	0.00202
SD of Detected Data	0.00457	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
R Value Adjusted for Ties in Data	9
K Value Adjusted for Ties in Data	7
Number of Site Observations in 'R' Largest	8

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
Full Precision	OFF
Confidence Coefficient	95%
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Nickel, dissolved(mw-13)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	8	96
Number of Detect Data	19	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	29.63%	64.43%
Minimum Detected	0.0035	0.001
Maximum Detected	0.168	0.0415
Mean of Detected Data	0.0169	0.0042
Median of Detected Data	0.0081	0.00202
SD of Detected Data	0.0369	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	4

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Nickel, dissolved(mw-14)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	149
Number of Non-Detect Data	9	96
Number of Detect Data	17	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	34.62%	64.43%
Minimum Detected	0.0013	0.001
Maximum Detected	0.0397	0.0415
Mean of Detected Data	0.011	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.0109	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	4

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Nickel, dissolved(mw-15)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	24	149
Number of Non-Detect Data	10	96
Number of Detect Data	14	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	41.67%	64.43%
Minimum Detected	0.0014	0.001
Maximum Detected	0.028	0.0415
Mean of Detected Data	0.00618	0.0042
Median of Detected Data	0.00309	0.00202
SD of Detected Data	0.00719	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
R Value Adjusted for Ties in Data	6
K Value Adjusted for Ties in Data	4
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-19)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	12	96
Number of Detect Data	10	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	54.55%	64.43%
Minimum Detected	0.0012	0.001
Maximum Detected	0.0202	0.0415
Mean of Detected Data	0.00566	0.0042
Median of Detected Data	0.0033	0.00202
SD of Detected Data	0.00588	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
R Value Adjusted for Ties in Data	9
K Value Adjusted for Ties in Data	6
Number of Site Observations in 'R' Largest	8

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-20-70)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	36	149
Number of Non-Detect Data	21	96
Number of Detect Data	15	53
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	58.33%	64.43%
Minimum Detected	0.0012	0.001
Maximum Detected	0.029	0.0415
Mean of Detected Data	0.00742	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.00779	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-20-100)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	10	96
Number of Detect Data	13	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	43.48%	64.43%
Minimum Detected	0.0011	0.001
Maximum Detected	0.13	0.0415
Mean of Detected Data	0.0161	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.0346	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
R Value Adjusted for Ties in Data	6
K Value Adjusted for Ties in Data	4
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

1	**Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects**	
2	**User Selected Options**	
3	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
4	Full Precision	OFF
5	Confidence Coefficient	95%
6	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
7	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Nickel, dissolved(mw-20-130)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	149
Number of Non-Detect Data	20	96
Number of Detect Data	14	53
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	58.82%	64.43%
Minimum Detected	0.00079	0.001
Maximum Detected	0.25	0.0415
Mean of Detected Data	0.0264	0.0042
Median of Detected Data	0.0052	0.00202
SD of Detected Data	0.0649	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	3

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-21)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	149
Number of Non-Detect Data	5	96
Number of Detect Data	20	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.025	0.00628
Percent Non detects	20.00%	64.43%
Minimum Detected	0.0017	0.001
Maximum Detected	0.158	0.0415
Mean of Detected Data	0.0244	0.0042
Median of Detected Data	0.0158	0.00202
SD of Detected Data	0.0347	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	0

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-22)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	10	96
Number of Detect Data	17	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	37.04%	64.43%
Minimum Detected	0.0013	0.001
Maximum Detected	0.5	0.0415
Mean of Detected Data	0.0479	0.0042
Median of Detected Data	0.014	0.00202
SD of Detected Data	0.12	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	4

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Nickel, dissolved(mw-23)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	149
Number of Non-Detect Data	11	96
Number of Detect Data	15	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.025	0.00628
Percent Non detects	42.31%	64.43%
Minimum Detected	0.0015	0.001
Maximum Detected	0.25	0.0415
Mean of Detected Data	0.0327	0.0042
Median of Detected Data	0.0189	0.00202
SD of Detected Data	0.0615	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	0

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

1				**Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects**								
2		**User Selected Options**										
3			From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)								
7			Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration								
8												
9												
10	**Area of Concern Data: Nickel, dissolved(mw-24a)**											
11	**Background Data: Nickel, dissolved(1)**											
12												
13				**Raw Statistics**								
14					Site	Background						
15				Number of Valid Data	25	149						
16				Number of Non-Detect Data	14	96						
17				Number of Detect Data	11	53						
18				Minimum Non-Detect	0.005	0.001						
19				Maximum Non-Detect	0.0278	0.00628						
20				Percent Non detects	56.00%	64.43%						
21				Minimum Detected	0.0013	0.001						
22				Maximum Detected	0.0225	0.0415						
23				Mean of Detected Data	0.00554	0.0042						
24				Median of Detected Data	0.0045	0.00202						
25				SD of Detected Data	0.00585	0.00635						
26												
27				**Quantile Test**								
28												
29	**H0: Site Concentration <= Background Concentration (Form 1)**											
30												
31				Approximate R Value (0.054)	5							
32				Approximate K Value (0.054)	3							
33				R Value Adjusted for Ties in Data	7							
34				K Value Adjusted for Ties in Data	5							
35				Number of Site Observations in 'R' Largest	6							
36												
37	**Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test**											

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-24b)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	11	96
Number of Detect Data	12	53
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	47.83%	64.43%
Minimum Detected	0.00069	0.001
Maximum Detected	0.053	0.0415
Mean of Detected Data	0.0102	0.0042
Median of Detected Data	0.00455	0.00202
SD of Detected Data	0.0159	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
R Value Adjusted for Ties in Data	6
K Value Adjusted for Ties in Data	4
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-24br)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	11	96
Number of Detect Data	11	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	50.00%	64.43%
Minimum Detected	0.0017	0.001
Maximum Detected	0.0172	0.0415
Mean of Detected Data	0.00547	0.0042
Median of Detected Data	0.0034	0.00202
SD of Detected Data	0.00481	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
R Value Adjusted for Ties in Data	8
K Value Adjusted for Ties in Data	5
Number of Site Observations in 'R' Largest	7

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-25)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	29	149
Number of Non-Detect Data	14	96
Number of Detect Data	15	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	48.28%	64.43%
Minimum Detected	0.00122	0.001
Maximum Detected	0.0213	0.0415
Mean of Detected Data	0.00467	0.0042
Median of Detected Data	0.0031	0.00202
SD of Detected Data	0.00507	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.052)	2
Approximate K Value (0.052)	2
R Value Adjusted for Ties in Data	3
K Value Adjusted for Ties in Data	3
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Nickel, dissolved(mw-26)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	149
Number of Non-Detect Data	14	96
Number of Detect Data	11	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	56.00%	64.43%
Minimum Detected	0.0014	0.001
Maximum Detected	0.0183	0.0415
Mean of Detected Data	0.0068	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.00609	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	4

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-27-20)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	10	96
Number of Detect Data	12	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	45.45%	64.43%
Minimum Detected	0.0014	0.001
Maximum Detected	0.11	0.0415
Mean of Detected Data	0.0183	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.0336	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
R Value Adjusted for Ties in Data	7
K Value Adjusted for Ties in Data	4
Number of Site Observations in 'R' Largest	6

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Nickel, dissolved(mw-28-25)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	21	149
Number of Non-Detect Data	11	96
Number of Detect Data	10	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	52.38%	64.43%
Minimum Detected	0.0022	0.001
Maximum Detected	0.0206	0.0415
Mean of Detected Data	0.00742	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.00515	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
R Value Adjusted for Ties in Data	8
K Value Adjusted for Ties in Data	5
Number of Site Observations in 'R' Largest	7

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-29)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	8	96
Number of Detect Data	14	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	36.36%	64.43%
Minimum Detected	0.0015	0.001
Maximum Detected	0.0213	0.0415
Mean of Detected Data	0.00772	0.0042
Median of Detected Data	0.0051	0.00202
SD of Detected Data	0.00625	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-30-30)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	7	96
Number of Detect Data	15	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	31.82%	64.43%
Minimum Detected	0.0017	0.001
Maximum Detected	0.5	0.0415
Mean of Detected Data	0.0509	0.0042
Median of Detected Data	0.017	0.00202
SD of Detected Data	0.125	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-31-60)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	11	96
Number of Detect Data	12	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	47.83%	64.43%
Minimum Detected	0.0017	0.001
Maximum Detected	0.13	0.0415
Mean of Detected Data	0.014	0.0042
Median of Detected Data	0.00225	0.00202
SD of Detected Data	0.0366	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
R Value Adjusted for Ties in Data	6
K Value Adjusted for Ties in Data	4
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
Full Precision	OFF
Confidence Coefficient	95%
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Nickel, dissolved(mw-34-55)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	8	96
Number of Detect Data	6	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0261	0.00628
Percent Non detects	57.14%	64.43%
Minimum Detected	0.00122	0.001
Maximum Detected	0.0223	0.0415
Mean of Detected Data	0.0101	0.0042
Median of Detected Data	0.00694	0.00202
SD of Detected Data	0.00914	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(mw-34-80)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	18	149
Number of Non-Detect Data	7	96
Number of Detect Data	11	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0261	0.00628
Percent Non detects	38.89%	64.43%
Minimum Detected	0.001	0.001
Maximum Detected	0.0222	0.0415
Mean of Detected Data	0.00591	0.0042
Median of Detected Data	0.00223	0.00202
SD of Detected Data	0.00697	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
R Value Adjusted for Ties in Data	9
K Value Adjusted for Ties in Data	6
Number of Site Observations in 'R' Largest	7

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(pge-6)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	7	96
Number of Detect Data	10	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	41.18%	64.43%
Minimum Detected	0.00091	0.001
Maximum Detected	0.014	0.0415
Mean of Detected Data	0.00406	0.0042
Median of Detected Data	0.002	0.00202
SD of Detected Data	0.00402	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(pge-7)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	149
Number of Non-Detect Data	6	96
Number of Detect Data	9	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	40.00%	64.43%
Minimum Detected	0.0015	0.001
Maximum Detected	0.015	0.0415
Mean of Detected Data	0.0048	0.0042
Median of Detected Data	0.0019	0.00202
SD of Detected Data	0.00477	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
R Value Adjusted for Ties in Data	6
K Value Adjusted for Ties in Data	5
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(pge-8)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	8	96
Number of Detect Data	9	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	47.06%	64.43%
Minimum Detected	0.0012	0.001
Maximum Detected	0.045	0.0415
Mean of Detected Data	0.0101	0.0042
Median of Detected Data	0.0037	0.00202
SD of Detected Data	0.0141	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Selenium, dissolved(mw-10)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	4	45
Number of Detect Data	10	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	28.57%	30.20%
Minimum Detected	0.00193	0.001
Maximum Detected	0.02	0.0136
Mean of Detected Data	0.0055	0.0029
Median of Detected Data	0.00399	0.00199
SD of Detected Data	0.00517	0.0027

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
R Value Adjusted for Ties in Data	4
K Value Adjusted for Ties in Data	3
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0196

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Selenium, dissolved(mw-11)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	10	149
Number of Non-Detect Data	3	45
Number of Detect Data	7	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	30.00%	30.20%
Minimum Detected	0.0045	0.001
Maximum Detected	0.0136	0.0136
Mean of Detected Data	0.00669	0.0029
Median of Detected Data	0.00573	0.00199
SD of Detected Data	0.00309	0.0027

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	2
K Value Adjusted for Ties in Data	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Selenium, dissolved(mw-20-70)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	4	45
Number of Detect Data	9	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	30.77%	30.20%
Minimum Detected	0.00783	0.001
Maximum Detected	0.0181	0.0136
Mean of Detected Data	0.0111	0.0029
Median of Detected Data	0.0111	0.00199
SD of Detected Data	0.00298	0.0027

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
R Value Adjusted for Ties in Data	4
K Value Adjusted for Ties in Data	3
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0171

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Selenium, dissolved(mw-20-130)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	12	149
Number of Non-Detect Data	1	45
Number of Detect Data	11	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	8.33%	30.20%
Minimum Detected	0.0107	0.001
Maximum Detected	0.023	0.0136
Mean of Detected Data	0.0142	0.0029
Median of Detected Data	0.013	0.00199
SD of Detected Data	0.0037	0.0027

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Selenium, dissolved(mw-25)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	10	149
Number of Non-Detect Data	3	45
Number of Detect Data	7	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	30.00%	30.20%
Minimum Detected	0.00204	0.001
Maximum Detected	0.0131	0.0136
Mean of Detected Data	0.00395	0.0029
Median of Detected Data	0.00238	0.00199
SD of Detected Data	0.00404	0.0027

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	0
Calculated Alpha	1

Conclusion with Alpha = 0

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Selenium, dissolved(ow-2d)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	9	45
Number of Detect Data	5	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	64.29%	30.20%
Minimum Detected	0.00208	0.001
Maximum Detected	0.0171	0.0136
Mean of Detected Data	0.00676	0.0029
Median of Detected Data	0.0056	0.00199
SD of Detected Data	0.00608	0.0027

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
R Value Adjusted for Ties in Data	4
K Value Adjusted for Ties in Data	3
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0196

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Vanadium, dissolved(mw-10)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	0	22
Number of Detect Data	17	127
Minimum Non-Detect	N/A	0.001
Maximum Non-Detect	N/A	0.0193
Percent Non detects	0.00%	14.77%
Minimum Detected	0.02	0.00102
Maximum Detected	0.165	0.0803
Mean of Detected Data	0.0443	0.0162
Median of Detected Data	0.0379	0.0131
SD of Detected Data	0.0321	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.028

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(mw-11)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	0	22
Number of Detect Data	13	127
Minimum Non-Detect	N/A	0.001
Maximum Non-Detect	N/A	0.0193
Percent Non detects	0.00%	14.77%
Minimum Detected	0.0036	0.00102
Maximum Detected	0.0859	0.0803
Mean of Detected Data	0.0148	0.0162
Median of Detected Data	0.00831	0.0131
SD of Detected Data	0.0219	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0171

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(mw-12)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	20	149
Number of Non-Detect Data	0	22
Number of Detect Data	20	127
Minimum Non-Detect	N/A	0.001
Maximum Non-Detect	N/A	0.0193
Percent Non detects	0.00%	14.77%
Minimum Detected	0.009	0.00102
Maximum Detected	0.218	0.0803
Mean of Detected Data	0.0401	0.0162
Median of Detected Data	0.0308	0.0131
SD of Detected Data	0.0431	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0.0227

Conclusion with Alpha = 0.057

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(mw-20-70)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	149
Number of Non-Detect Data	1	22
Number of Detect Data	15	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.003	0.0193
Percent Non detects	6.25%	14.77%
Minimum Detected	0.0034	0.00102
Maximum Detected	0.117	0.0803
Mean of Detected Data	0.0229	0.0162
Median of Detected Data	0.00961	0.0131
SD of Detected Data	0.0339	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0.0251

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Vanadium, dissolved(mw-20-130)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	149
Number of Non-Detect Data	4	22
Number of Detect Data	11	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.01	0.0193
Percent Non detects	26.67%	14.77%
Minimum Detected	0.0028	0.00102
Maximum Detected	0.172	0.0803
Mean of Detected Data	0.0291	0.0162
Median of Detected Data	0.00413	0.0131
SD of Detected Data	0.0553	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0.0223

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(mw-25)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	2	22
Number of Detect Data	11	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.003	0.0193
Percent Non detects	15.38%	14.77%
Minimum Detected	0.0051	0.00102
Maximum Detected	0.0733	0.0803
Mean of Detected Data	0.0157	0.0162
Median of Detected Data	0.0112	0.0131
SD of Detected Data	0.0193	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0171

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(mw-34-55)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	9	149
Number of Non-Detect Data	4	22
Number of Detect Data	5	127
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	44.44%	14.77%
Minimum Detected	0.00115	0.00102
Maximum Detected	0.227	0.0803
Mean of Detected Data	0.0488	0.0162
Median of Detected Data	0.0065	0.0131
SD of Detected Data	0.0996	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(mw-34-80)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	3	22
Number of Detect Data	10	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	23.08%	14.77%
Minimum Detected	0.0016	0.00102
Maximum Detected	0.238	0.0803
Mean of Detected Data	0.0282	0.0162
Median of Detected Data	0.00259	0.0131
SD of Detected Data	0.0739	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0171

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(mw-37d)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	2	22
Number of Detect Data	11	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.003	0.0193
Percent Non detects	15.38%	14.77%
Minimum Detected	0.004	0.00102
Maximum Detected	0.326	0.0803
Mean of Detected Data	0.038	0.0162
Median of Detected Data	0.00614	0.0131
SD of Detected Data	0.0959	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0171

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(ow-1d)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	149
Number of Non-Detect Data	1	22
Number of Detect Data	14	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.003	0.0193
Percent Non detects	6.67%	14.77%
Minimum Detected	0.00169	0.00102
Maximum Detected	0.122	0.0803
Mean of Detected Data	0.0236	0.0162
Median of Detected Data	0.0123	0.0131
SD of Detected Data	0.0336	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0.0223

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(ow-1m)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	2	22
Number of Detect Data	12	127
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	14.29%	14.77%
Minimum Detected	0.00184	0.00102
Maximum Detected	0.0625	0.0803
Mean of Detected Data	0.0181	0.0162
Median of Detected Data	0.0128	0.0131
SD of Detected Data	0.0192	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	0
Calculated Alpha	0.0196

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(ow-2d)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	4	22
Number of Detect Data	10	127
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	28.57%	14.77%
Minimum Detected	0.00148	0.00102
Maximum Detected	0.0862	0.0803
Mean of Detected Data	0.0233	0.0162
Median of Detected Data	0.0161	0.0131
SD of Detected Data	0.0261	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0196

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(ow-2m)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	2	22
Number of Detect Data	11	127
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	15.38%	14.77%
Minimum Detected	0.0021	0.00102
Maximum Detected	0.0913	0.0803
Mean of Detected Data	0.0202	0.0162
Median of Detected Data	0.0114	0.0131
SD of Detected Data	0.0273	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0171

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(ow-5d)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	3	22
Number of Detect Data	11	127
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	21.43%	14.77%
Minimum Detected	0.00166	0.00102
Maximum Detected	0.0966	0.0803
Mean of Detected Data	0.0249	0.0162
Median of Detected Data	0.013	0.0131
SD of Detected Data	0.033	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0.0196

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(ow-5m)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	2	22
Number of Detect Data	12	127
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	14.29%	14.77%
Minimum Detected	0.00181	0.00102
Maximum Detected	0.122	0.0803
Mean of Detected Data	0.0239	0.0162
Median of Detected Data	0.0111	0.0131
SD of Detected Data	0.036	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0.0196

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-9)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	143
Number of Non-Detect Data	1	49
Number of Detect Data	26	94
Minimum Non-Detect	0.082	0.01
Maximum Non-Detect	0.082	0.0162
Percent Non detects	3.70%	34.27%
Minimum Detected	0.0034	0.0106
Maximum Detected	0.363	0.137
Mean of Detected Data	0.0802	0.0388
Median of Detected Data	0.0249	0.0281
SD of Detected Data	0.108	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5
Calculated Alpha	0.029

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-10)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	39	143
Number of Non-Detect Data	11	49
Number of Detect Data	28	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0289	0.0162
Percent Non detects	28.21%	34.27%
Minimum Detected	0.0053	0.0106
Maximum Detected	0.637	0.137
Mean of Detected Data	0.0782	0.0388
Median of Detected Data	0.024	0.0281
SD of Detected Data	0.142	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.056

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-11)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	35	143
Number of Non-Detect Data	9	49
Number of Detect Data	26	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0214	0.0162
Percent Non detects	25.71%	34.27%
Minimum Detected	0.0053	0.0106
Maximum Detected	0.45	0.137
Mean of Detected Data	0.0743	0.0388
Median of Detected Data	0.021	0.0281
SD of Detected Data	0.129	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
	User Selected Options	
	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
	Full Precision	OFF
	Confidence Coefficient	95%
	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Zinc, dissolved(mw-12)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	41	143
Number of Non-Detect Data	11	49
Number of Detect Data	30	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0261	0.0162
Percent Non detects	26.83%	34.27%
Minimum Detected	0.0046	0.0106
Maximum Detected	0.54	0.137
Mean of Detected Data	0.0522	0.0388
Median of Detected Data	0.0223	0.0281
SD of Detected Data	0.0969	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.056)	6
Approximate K Value (0.056)	4
Number of Site Observations in 'R' Largest	2
Calculated Alpha	N/A

Conclusion with Alpha = 0.056

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-13)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	143
Number of Non-Detect Data	4	49
Number of Detect Data	23	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0758	0.0162
Percent Non detects	14.81%	34.27%
Minimum Detected	0.0068	0.0106
Maximum Detected	0.451	0.137
Mean of Detected Data	0.0911	0.0388
Median of Detected Data	0.0313	0.0281
SD of Detected Data	0.119	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5
Calculated Alpha	0.029

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-14)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	143
Number of Non-Detect Data	2	49
Number of Detect Data	24	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0676	0.0162
Percent Non detects	7.69%	34.27%
Minimum Detected	0.008	0.0106
Maximum Detected	0.498	0.137
Mean of Detected Data	0.085	0.0388
Median of Detected Data	0.0406	0.0281
SD of Detected Data	0.116	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5
Calculated Alpha	0.0264

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-15)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	24	143
Number of Non-Detect Data	3	49
Number of Detect Data	21	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0356	0.0162
Percent Non detects	12.50%	34.27%
Minimum Detected	0.004	0.0106
Maximum Detected	0.419	0.137
Mean of Detected Data	0.0692	0.0388
Median of Detected Data	0.037	0.0281
SD of Detected Data	0.106	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0217

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-19)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	143
Number of Non-Detect Data	3	49
Number of Detect Data	19	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0315	0.0162
Percent Non detects	13.64%	34.27%
Minimum Detected	0.011	0.0106
Maximum Detected	0.398	0.137
Mean of Detected Data	0.0869	0.0388
Median of Detected Data	0.043	0.0281
SD of Detected Data	0.111	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
R Value Adjusted for Ties in Data	7
K Value Adjusted for Ties in Data	4
Number of Site Observations in 'R' Largest	4
Calculated Alpha	0.0318

Conclusion with Alpha = 0.057

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-20-70)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	36	143
Number of Non-Detect Data	8	49
Number of Detect Data	28	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0611	0.0162
Percent Non detects	22.22%	34.27%
Minimum Detected	0.0112	0.0106
Maximum Detected	0.53	0.137
Mean of Detected Data	0.0912	0.0388
Median of Detected Data	0.027	0.0281
SD of Detected Data	0.129	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-20-100)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	143
Number of Non-Detect Data	2	49
Number of Detect Data	21	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0558	0.0162
Percent Non detects	8.70%	34.27%
Minimum Detected	0.0065	0.0106
Maximum Detected	0.486	0.137
Mean of Detected Data	0.0996	0.0388
Median of Detected Data	0.054	0.0281
SD of Detected Data	0.112	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5
Calculated Alpha	0.0195

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-20-130)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	143
Number of Non-Detect Data	7	49
Number of Detect Data	27	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.1	0.0162
Percent Non detects	20.59%	34.27%
Minimum Detected	0.0102	0.0106
Maximum Detected	0.445	0.137
Mean of Detected Data	0.097	0.0388
Median of Detected Data	0.053	0.0281
SD of Detected Data	0.0974	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.053)	4
Approximate K Value (0.053)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	N/A

Conclusion with Alpha = 0.053

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-21)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	143
Number of Non-Detect Data	5	49
Number of Detect Data	20	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.097	0.0162
Percent Non detects	20.00%	34.27%
Minimum Detected	0.0053	0.0106
Maximum Detected	0.692	0.137
Mean of Detected Data	0.181	0.0388
Median of Detected Data	0.0818	0.0281
SD of Detected Data	0.215	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5
Calculated Alpha	0.024

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-22)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	143
Number of Non-Detect Data	5	49
Number of Detect Data	22	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0487	0.0162
Percent Non detects	18.52%	34.27%
Minimum Detected	0.0068	0.0106
Maximum Detected	0.734	0.137
Mean of Detected Data	0.0911	0.0388
Median of Detected Data	0.0473	0.0281
SD of Detected Data	0.154	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.029

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-23)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	143
Number of Non-Detect Data	4	49
Number of Detect Data	22	94
Minimum Non-Detect	0.02	0.01
Maximum Non-Detect	0.0405	0.0162
Percent Non detects	15.38%	34.27%
Minimum Detected	0.0066	0.0106
Maximum Detected	0.817	0.137
Mean of Detected Data	0.123	0.0388
Median of Detected Data	0.0464	0.0281
SD of Detected Data	0.198	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5
Calculated Alpha	0.0264

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-24a)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	143
Number of Non-Detect Data	4	49
Number of Detect Data	21	94
Minimum Non-Detect	0.02	0.01
Maximum Non-Detect	0.0541	0.0162
Percent Non detects	16.00%	34.27%
Minimum Detected	0.0056	0.0106
Maximum Detected	0.62	0.137
Mean of Detected Data	0.104	0.0388
Median of Detected Data	0.0412	0.0281
SD of Detected Data	0.149	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	0.024

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-24b)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	143
Number of Non-Detect Data	3	49
Number of Detect Data	20	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0805	0.0162
Percent Non detects	13.04%	34.27%
Minimum Detected	0.0096	0.0106
Maximum Detected	0.468	0.137
Mean of Detected Data	0.0868	0.0388
Median of Detected Data	0.03	0.0281
SD of Detected Data	0.124	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0195

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-24br)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	143
Number of Non-Detect Data	3	49
Number of Detect Data	19	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0739	0.0162
Percent Non detects	13.64%	34.27%
Minimum Detected	0.009	0.0106
Maximum Detected	0.152	0.137
Mean of Detected Data	0.068	0.0388
Median of Detected Data	0.055	0.0281
SD of Detected Data	0.0516	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	0.0318

Conclusion with Alpha = 0.057

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-25)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	29	143
Number of Non-Detect Data	6	49
Number of Detect Data	23	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.02	0.0162
Percent Non detects	20.69%	34.27%
Minimum Detected	0.0073	0.0106
Maximum Detected	0.555	0.137
Mean of Detected Data	0.0887	0.0388
Median of Detected Data	0.04	0.0281
SD of Detected Data	0.125	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.052)	2
Approximate K Value (0.052)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0

Conclusion with Alpha = 0.052

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-26)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	143
Number of Non-Detect Data	2	49
Number of Detect Data	23	94
Minimum Non-Detect	0.02	0.01
Maximum Non-Detect	0.0665	0.0162
Percent Non detects	8.00%	34.27%
Minimum Detected	0.0088	0.0106
Maximum Detected	0.514	0.137
Mean of Detected Data	0.105	0.0388
Median of Detected Data	0.049	0.0281
SD of Detected Data	0.131	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5
Calculated Alpha	0.024

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-27-20)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	143
Number of Non-Detect Data	4	49
Number of Detect Data	18	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.194	0.0162
Percent Non detects	18.18%	34.27%
Minimum Detected	0.0053	0.0106
Maximum Detected	0.44	0.137
Mean of Detected Data	0.0875	0.0388
Median of Detected Data	0.0299	0.0281
SD of Detected Data	0.119	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-28-25)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	21	143
Number of Non-Detect Data	2	49
Number of Detect Data	19	94
Minimum Non-Detect	0.0482	0.01
Maximum Non-Detect	0.168	0.0162
Percent Non detects	9.52%	34.27%
Minimum Detected	0.0053	0.0106
Maximum Detected	0.286	0.137
Mean of Detected Data	0.0613	0.0388
Median of Detected Data	0.053	0.0281
SD of Detected Data	0.0706	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	5

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-29)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	143
Number of Non-Detect Data	1	49
Number of Detect Data	21	94
Minimum Non-Detect	0.0703	0.01
Maximum Non-Detect	0.0703	0.0162
Percent Non detects	4.55%	34.27%
Minimum Detected	0.0049	0.0106
Maximum Detected	0.356	0.137
Mean of Detected Data	0.077	0.0388
Median of Detected Data	0.046	0.0281
SD of Detected Data	0.102	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	4
Calculated Alpha	0.0318

Conclusion with Alpha = 0.057

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-30-30)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	143
Number of Non-Detect Data	4	49
Number of Detect Data	18	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0428	0.0162
Percent Non detects	18.18%	34.27%
Minimum Detected	0.008	0.0106
Maximum Detected	0.597	0.137
Mean of Detected Data	0.0749	0.0388
Median of Detected Data	0.0365	0.0281
SD of Detected Data	0.135	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.0318

Conclusion with Alpha = 0.057

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-31-60)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	143
Number of Non-Detect Data	2	49
Number of Detect Data	21	94
Minimum Non-Detect	0.02	0.01
Maximum Non-Detect	0.0635	0.0162
Percent Non detects	8.70%	34.27%
Minimum Detected	0.0073	0.0106
Maximum Detected	0.274	0.137
Mean of Detected Data	0.0807	0.0388
Median of Detected Data	0.036	0.0281
SD of Detected Data	0.0848	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.054)	5
Approximate K Value (0.054)	3
Number of Site Observations in 'R' Largest	5
Calculated Alpha	0.0195

Conclusion with Alpha = 0.054

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-32-35)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	9	143
Number of Non-Detect Data	4	49
Number of Detect Data	5	94
Minimum Non-Detect	0.02	0.01
Maximum Non-Detect	0.2	0.0162
Percent Non detects	44.44%	34.27%
Minimum Detected	0.0398	0.0106
Maximum Detected	0.381	0.137
Mean of Detected Data	0.223	0.0388
Median of Detected Data	0.297	0.0281
SD of Detected Data	0.157	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0)	0
Approximate K Value (0)	0
R Value Adjusted for Ties in Data	1
K Value Adjusted for Ties in Data	1
Number of Site Observations in 'R' Largest	1
Calculated Alpha	1

Conclusion with Alpha = 0

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-34-55)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	143
Number of Non-Detect Data	5	49
Number of Detect Data	9	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0831	0.0162
Percent Non detects	35.71%	34.27%
Minimum Detected	0.0141	0.0106
Maximum Detected	0.163	0.137
Mean of Detected Data	0.0536	0.0388
Median of Detected Data	0.0349	0.0281
SD of Detected Data	0.048	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0211

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-34-80)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	18	143
Number of Non-Detect Data	9	49
Number of Detect Data	9	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0755	0.0162
Percent Non detects	50.00%	34.27%
Minimum Detected	0.0232	0.0106
Maximum Detected	0.0854	0.137
Mean of Detected Data	0.0479	0.0388
Median of Detected Data	0.037	0.0281
SD of Detected Data	0.0234	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.057)	6
Approximate K Value (0.057)	3
Number of Site Observations in 'R' Largest	0
Calculated Alpha	0.0192

Conclusion with Alpha = 0.057

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(mw-37d)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	143
Number of Non-Detect Data	8	49
Number of Detect Data	5	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.02	0.0162
Percent Non detects	61.54%	34.27%
Minimum Detected	0.011	0.0106
Maximum Detected	0.0918	0.137
Mean of Detected Data	0.0386	0.0388
Median of Detected Data	0.0266	0.0281
SD of Detected Data	0.0313	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	0
Calculated Alpha	0.0184

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(ow-5m)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	143
Number of Non-Detect Data	9	49
Number of Detect Data	5	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.02	0.0162
Percent Non detects	64.29%	34.27%
Minimum Detected	0.0238	0.0106
Maximum Detected	0.278	0.137
Mean of Detected Data	0.0781	0.0388
Median of Detected Data	0.0264	0.0281
SD of Detected Data	0.112	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.0211

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(pge-6)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	143
Number of Non-Detect Data	1	49
Number of Detect Data	16	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.005	0.0162
Percent Non detects	5.88%	34.27%
Minimum Detected	0.0067	0.0106
Maximum Detected	1.5	0.137
Mean of Detected Data	0.142	0.0388
Median of Detected Data	0.037	0.0281
SD of Detected Data	0.365	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	2
Calculated Alpha	0.03

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(pge-7)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	143
Number of Non-Detect Data	0	49
Number of Detect Data	15	94
Minimum Non-Detect	N/A	0.01
Maximum Non-Detect	N/A	0.0162
Percent Non detects	0.00%	34.27%
Minimum Detected	0.01	0.0106
Maximum Detected	0.125	0.137
Mean of Detected Data	0.0379	0.0388
Median of Detected Data	0.029	0.0281
SD of Detected Data	0.0297	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	1
Calculated Alpha	0.024

Conclusion with Alpha = 0.044

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(pge-8)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	143
Number of Non-Detect Data	0	49
Number of Detect Data	17	94
Minimum Non-Detect	N/A	0.01
Maximum Non-Detect	N/A	0.0162
Percent Non detects	0.00%	34.27%
Minimum Detected	0.015	0.0106
Maximum Detected	0.82	0.137
Mean of Detected Data	0.177	0.0388
Median of Detected Data	0.08	0.0281
SD of Detected Data	0.24	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.044)	3
Approximate K Value (0.044)	2
Number of Site Observations in 'R' Largest	3
Calculated Alpha	0.03

Conclusion with Alpha = 0.044

Reject H0, Conclude Site Concentration > Background Concentration

ARCADIS

Well-Specific

Mann-Whitney Outputs

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Arsenic, dissolved(mw-12)

Background Data: Arsenic, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	132
Number of Non-Detect Data	0	3
Number of Detect Data	17	129
Minimum Non-Detect	N/A	0.001
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	2.27%
Minimum Detected	0.052	0.00107
Maximum Detected	0.157	0.0191
Mean of Detected Data	0.0921	0.00598
Median of Detected Data	0.0819	0.0054
SD of Detected Data	0.0318	0.00389

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2397
WMW Test U-Stat	2244
WMW Critical Value (0.050)	2128
Approximate P-Value	1.069E-11

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

	Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(cw-1d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	149
Number of Non-Detect Data	0	1
Number of Detect Data	8	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.012	0.0035
Maximum Detected	0.0518	0.0417
Mean of Detected Data	0.0303	0.0113
Median of Detected Data	0.03	0.00866
SD of Detected Data	0.0151	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1110
WMW Test U-Stat	1074
WMW Critical Value (0.050)	1144
Approximate P-Value	6.906E-05

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(cw-2d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	149
Number of Non-Detect Data	0	1
Number of Detect Data	8	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0339	0.0035
Maximum Detected	0.0732	0.0417
Mean of Detected Data	0.0527	0.0113
Median of Detected Data	0.051	0.00866
SD of Detected Data	0.0128	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1223
WMW Test U-Stat	1187
WMW Critical Value (0.050)	1144
Approximate P-Value	1.218E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

	Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(cw-3d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	149
Number of Non-Detect Data	0	1
Number of Detect Data	8	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0292	0.0035
Maximum Detected	0.0882	0.0417
Mean of Detected Data	0.0522	0.0113
Median of Detected Data	0.0555	0.00866
SD of Detected Data	0.0196	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1214
WMW Test U-Stat	1178
WMW Critical Value (0.050)	1144
Approximate P-Value	1.728E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(cw-3m)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	149
Number of Non-Detect Data	0	1
Number of Detect Data	8	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0154	0.0035
Maximum Detected	0.0378	0.0417
Mean of Detected Data	0.0248	0.0113
Median of Detected Data	0.0225	0.00866
SD of Detected Data	0.00748	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1130
WMW Test U-Stat	1094
WMW Critical Value (0.050)	1144
Approximate P-Value	3.637E-05

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(cw-4d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	149
Number of Non-Detect Data	0	1
Number of Detect Data	8	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0218	0.0035
Maximum Detected	0.0442	0.0417
Mean of Detected Data	0.0365	0.0113
Median of Detected Data	0.0391	0.00866
SD of Detected Data	0.00833	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1205
WMW Test U-Stat	1169
WMW Critical Value (0.050)	1144
Approximate P-Value	2.441E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

	Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(mw-10)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	0	1
Number of Detect Data	17	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0683	0.0035
Maximum Detected	0.301	0.0417
Mean of Detected Data	0.14	0.0113
Median of Detected Data	0.122	0.00866
SD of Detected Data	0.0607	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2686
WMW Test U-Stat	2533
WMW Critical Value (0.050)	2417
Approximate P-Value	7.761E-12

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

	Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(mw-12)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	20	149
Number of Non-Detect Data	0	1
Number of Detect Data	20	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.019	0.0035
Maximum Detected	0.087	0.0417
Mean of Detected Data	0.0461	0.0113
Median of Detected Data	0.041	0.00866
SD of Detected Data	0.0212	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	3095
WMW Test U-Stat	2885
WMW Critical Value (0.050)	2841
Approximate P-Value	5.823E-12

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

	Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(mw-20-130)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	149
Number of Non-Detect Data	0	1
Number of Detect Data	15	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.018	0.0035
Maximum Detected	0.0576	0.0417
Mean of Detected Data	0.0435	0.0113
Median of Detected Data	0.0455	0.00866
SD of Detected Data	0.0094	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2321
WMW Test U-Stat	2201
WMW Critical Value (0.050)	2134
Approximate P-Value	3.249E-10

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(mw-37d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	0	1
Number of Detect Data	13	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.034	0.0035
Maximum Detected	0.0518	0.0417
Mean of Detected Data	0.0444	0.0113
Median of Detected Data	0.0455	0.00866
SD of Detected Data	0.00582	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2016
WMW Test U-Stat	1925
WMW Critical Value (0.050)	1851
Approximate P-Value	1.888E-09

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

	Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(ow-1d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	0	1
Number of Detect Data	17	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0088	0.0035
Maximum Detected	0.0518	0.0417
Mean of Detected Data	0.0267	0.0113
Median of Detected Data	0.0262	0.00866
SD of Detected Data	0.0133	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2351
WMW Test U-Stat	2198
WMW Critical Value (0.050)	2417
Approximate P-Value	3.598E-07

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

	Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(ow-2d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	149
Number of Non-Detect Data	0	1
Number of Detect Data	16	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0082	0.0035
Maximum Detected	0.0665	0.0417
Mean of Detected Data	0.0205	0.0113
Median of Detected Data	0.0127	0.00866
SD of Detected Data	0.0191	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1835
WMW Test U-Stat	1699
WMW Critical Value (0.050)	2276
Approximate P-Value	0.00264

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(ow-2s)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	149
Number of Non-Detect Data	0	1
Number of Detect Data	15	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.029	0.0035
Maximum Detected	0.0893	0.0417
Mean of Detected Data	0.0414	0.0113
Median of Detected Data	0.0383	0.00866
SD of Detected Data	0.0144	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2322
WMW Test U-Stat	2202
WMW Critical Value (0.050)	2134
Approximate P-Value	3.133E-10

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

	Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(ow-5d)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	149
Number of Non-Detect Data	0	1
Number of Detect Data	16	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0118	0.0035
Maximum Detected	0.0838	0.0417
Mean of Detected Data	0.0349	0.0113
Median of Detected Data	0.0316	0.00866
SD of Detected Data	0.0226	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2234
WMW Test U-Stat	2098
WMW Critical Value (0.050)	2276
Approximate P-Value	3.079E-07

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

	Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(ow-5m)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	149
Number of Non-Detect Data	0	1
Number of Detect Data	16	148
Minimum Non-Detect	N/A	0.00758
Maximum Non-Detect	N/A	0.00758
Percent Non detects	0.00%	0.67%
Minimum Detected	0.0098	0.0035
Maximum Detected	0.0501	0.0417
Mean of Detected Data	0.0266	0.0113
Median of Detected Data	0.0255	0.00866
SD of Detected Data	0.0115	0.00752

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.00758 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2259
WMW Test U-Stat	2123
WMW Critical Value (0.050)	2276
Approximate P-Value	1.519E-07

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

ARCADIS

Well-Specific

Gehan Outputs

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Barium, dissolved(mw-11)

Background Data: Barium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	3	0
Number of Detect Data	11	149
Minimum Non-Detect	0.3	N/A
Maximum Non-Detect	0.5	N/A
Percent Non detects	21.43%	0.00%
Minimum Detected	0.028	0.0115
Maximum Detected	0.22	0.188
Mean of Detected Data	0.056	0.06
Median of Detected Data	0.0398	0.0488
SD of Detected Data	0.0546	0.0381

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.88
Critical z (0.95)	1.645
P-Value	0.811

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-23)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	36	148
Number of Non-Detect Data	22	38
Number of Detect Data	14	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	61.11%	25.68%
Minimum Detected	0.0011	0.00022
Maximum Detected	1.02	0.0376
Mean of Detected Data	0.0838	0.0102
Median of Detected Data	0.0125	0.00885
SD of Detected Data	0.27	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.494
Critical z (0.95)	1.645
P-Value	0.689

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-34-80)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	88	148
Number of Non-Detect Data	75	38
Number of Detect Data	13	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	85.23%	25.68%
Minimum Detected	0.00086	0.00022
Maximum Detected	0.111	0.0376
Mean of Detected Data	0.0248	0.0102
Median of Detected Data	0.0073	0.00885
SD of Detected Data	0.036	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-7.313
Critical z (0.95)	1.645
P-Value	1

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\IRIS\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemic	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-35-60)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	148
Number of Non-Detect Data	0	38
Number of Detect Data	13	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0048	0.00022
Maximum Detected	0.0351	0.0376
Mean of Detected Data	0.0274	0.0102
Median of Detected Data	0.0286	0.00885
SD of Detected Data	0.0081	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.158
Critical z (0.95)	1.645
P-Value	1.245E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\IRIS\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemic	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-35-135)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	148
Number of Non-Detect Data	1	38
Number of Detect Data	13	110
Minimum Non-Detect	0.00075	0.0002
Maximum Non-Detect	0.00075	0.001
Percent Non detects	7.14%	25.68%
Minimum Detected	0.0079	0.00022
Maximum Detected	0.0354	0.0376
Mean of Detected Data	0.023	0.0102
Median of Detected Data	0.023	0.00885
SD of Detected Data	0.00832	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.291
Critical z (0.95)	1.645
P-Value	8.898E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\IRIS\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemic	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(ow-5s)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	148
Number of Non-Detect Data	0	38
Number of Detect Data	16	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0223	0.00022
Maximum Detected	0.0326	0.0376
Mean of Detected Data	0.0255	0.0102
Median of Detected Data	0.0254	0.00885
SD of Detected Data	0.00254	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.969
Critical z (0.95)	1.645
P-Value	1.196E-09

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Cobalt, dissolved(mw-34-80)

Background Data: Cobalt, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	8	145
Number of Detect Data	5	4
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.005	0.001
Percent Non detects	61.54%	97.32%
Minimum Detected	0.00108	0.00101
Maximum Detected	0.00139	0.00164
Mean of Detected Data	0.00125	0.00136
Median of Detected Data	0.00123	0.00139
SD of Detected Data	0.0001203	0.0002611

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.654
Critical z (0.95)	1.645
P-Value	7.845E-09

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-9)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	10	45
Number of Detect Data	17	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0555	0.00325
Percent Non detects	37.04%	30.20%
Minimum Detected	0.0024	0.00101
Maximum Detected	0.0167	0.0205
Mean of Detected Data	0.00672	0.00417
Median of Detected Data	0.0052	0.00318
SD of Detected Data	0.00447	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.577
Critical z (0.95)	1.645
P-Value	0.0001736

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-10)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	39	149
Number of Non-Detect Data	23	45
Number of Detect Data	16	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.02	0.00325
Percent Non detects	58.97%	30.20%
Minimum Detected	0.00118	0.00101
Maximum Detected	0.026	0.0205
Mean of Detected Data	0.00493	0.00417
Median of Detected Data	0.0031	0.00318
SD of Detected Data	0.00595	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.623
Critical z (0.95)	1.645
P-Value	0.267

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-11)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	35	149
Number of Non-Detect Data	23	45
Number of Detect Data	12	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	65.71%	30.20%
Minimum Detected	0.00122	0.00101
Maximum Detected	0.019	0.0205
Mean of Detected Data	0.00543	0.00417
Median of Detected Data	0.0038	0.00318
SD of Detected Data	0.00494	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.77
Critical z (0.95)	1.645
P-Value	0.221

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-12)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	41	149
Number of Non-Detect Data	27	45
Number of Detect Data	14	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	65.85%	30.20%
Minimum Detected	0.0013	0.00101
Maximum Detected	0.018	0.0205
Mean of Detected Data	0.00577	0.00417
Median of Detected Data	0.00412	0.00318
SD of Detected Data	0.00419	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.662
Critical z (0.95)	1.645
P-Value	0.254

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-13)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	16	45
Number of Detect Data	11	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	59.26%	30.20%
Minimum Detected	0.0016	0.00101
Maximum Detected	0.011	0.0205
Mean of Detected Data	0.00599	0.00417
Median of Detected Data	0.0053	0.00318
SD of Detected Data	0.0033	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.899
Critical z (0.95)	1.645
P-Value	0.0288

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-14)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	149
Number of Non-Detect Data	14	45
Number of Detect Data	12	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.02	0.00325
Percent Non detects	53.85%	30.20%
Minimum Detected	0.00348	0.00101
Maximum Detected	0.0297	0.0205
Mean of Detected Data	0.00757	0.00417
Median of Detected Data	0.0045	0.00318
SD of Detected Data	0.0074	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.534
Critical z (0.95)	1.645
P-Value	0.00564

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-15)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	24	149
Number of Non-Detect Data	17	45
Number of Detect Data	7	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	70.83%	30.20%
Minimum Detected	0.00111	0.00101
Maximum Detected	0.019	0.0205
Mean of Detected Data	0.00903	0.00417
Median of Detected Data	0.0072	0.00318
SD of Detected Data	0.00582	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.617
Critical z (0.95)	1.645
P-Value	0.053

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-19)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	16	45
Number of Detect Data	6	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	72.73%	30.20%
Minimum Detected	0.0016	0.00101
Maximum Detected	0.0126	0.0205
Mean of Detected Data	0.00595	0.00417
Median of Detected Data	0.0053	0.00318
SD of Detected Data	0.00387	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.863
Critical z (0.95)	1.645
P-Value	0.194

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-20-70)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	36	149
Number of Non-Detect Data	20	45
Number of Detect Data	16	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	55.56%	30.20%
Minimum Detected	0.00107	0.00101
Maximum Detected	0.0785	0.0205
Mean of Detected Data	0.00977	0.00417
Median of Detected Data	0.0039	0.00318
SD of Detected Data	0.0189	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.157
Critical z (0.95)	1.645
P-Value	0.124

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-20-100)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	13	45
Number of Detect Data	10	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	56.52%	30.20%
Minimum Detected	0.002	0.00101
Maximum Detected	0.05	0.0205
Mean of Detected Data	0.0107	0.00417
Median of Detected Data	0.00645	0.00318
SD of Detected Data	0.0145	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.226
Critical z (0.95)	1.645
P-Value	0.013

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-20-130)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	149
Number of Non-Detect Data	24	45
Number of Detect Data	10	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	70.59%	30.20%
Minimum Detected	0.00162	0.00101
Maximum Detected	0.1	0.0205
Mean of Detected Data	0.0156	0.00417
Median of Detected Data	0.00615	0.00318
SD of Detected Data	0.0299	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.461
Critical z (0.95)	1.645
P-Value	0.322

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-21)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	149
Number of Non-Detect Data	8	45
Number of Detect Data	17	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	32.00%	30.20%
Minimum Detected	0.0047	0.00101
Maximum Detected	0.111	0.0205
Mean of Detected Data	0.0221	0.00417
Median of Detected Data	0.0095	0.00318
SD of Detected Data	0.0269	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.148
Critical z (0.95)	1.645
P-Value	1.314E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-22)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	13	45
Number of Detect Data	14	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	48.15%	30.20%
Minimum Detected	0.0033	0.00101
Maximum Detected	0.2	0.0205
Mean of Detected Data	0.0325	0.00417
Median of Detected Data	0.0068	0.00318
SD of Detected Data	0.0613	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.693
Critical z (0.95)	1.645
P-Value	0.0001108

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-23)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	149
Number of Non-Detect Data	16	45
Number of Detect Data	10	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	61.54%	30.20%
Minimum Detected	0.0031	0.00101
Maximum Detected	0.1	0.0205
Mean of Detected Data	0.0194	0.00417
Median of Detected Data	0.0058	0.00318
SD of Detected Data	0.0313	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.459
Critical z (0.95)	1.645
P-Value	0.00696

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-24a)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	149
Number of Non-Detect Data	15	45
Number of Detect Data	10	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.02	0.00325
Percent Non detects	60.00%	30.20%
Minimum Detected	0.0027	0.00101
Maximum Detected	0.076	0.0205
Mean of Detected Data	0.0133	0.00417
Median of Detected Data	0.00565	0.00318
SD of Detected Data	0.0223	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.318
Critical z (0.95)	1.645
P-Value	0.0102

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-24b)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	15	45
Number of Detect Data	8	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	65.22%	30.20%
Minimum Detected	0.0026	0.00101
Maximum Detected	0.019	0.0205
Mean of Detected Data	0.00694	0.00417
Median of Detected Data	0.00415	0.00318
SD of Detected Data	0.00598	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.399
Critical z (0.95)	1.645
P-Value	0.0809

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-24br)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	14	45
Number of Detect Data	8	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	63.64%	30.20%
Minimum Detected	0.0025	0.00101
Maximum Detected	0.0655	0.0205
Mean of Detected Data	0.0173	0.00417
Median of Detected Data	0.00585	0.00318
SD of Detected Data	0.0227	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.109
Critical z (0.95)	1.645
P-Value	0.0175

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	A	B	C	D	E	F	G	H	I	J	K	L
1				**Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects**								
2		**User Selected Options**										
3		From File		I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files								
4		Full Precision		OFF								
5		Confidence Coefficient		95%								
6		Substantial Difference		0								
7		Selected Null Hypothesis		Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)								
8		Alternative Hypothesis		Site or AOC Mean/Median Greater Than Background Mean/Median								
9												
10												
11	**Area of Concern Data: Copper, dissolved(mw-25)**											
12	**Background Data: Copper, dissolved(1)**											
13												
14				**Raw Statistics**								
15					Site	Background						
16				Number of Valid Data	29	149						
17				Number of Non-Detect Data	22	45						
18				Number of Detect Data	7	104						
19				Minimum Non-Detect	0.001	0.001						
20				Maximum Non-Detect	0.4	0.00325						
21				Percent Non detects	75.86%	30.20%						
22				Minimum Detected	0.00134	0.00101						
23				Maximum Detected	0.02	0.0205						
24				Mean of Detected Data	0.00813	0.00417						
25				Median of Detected Data	0.0071	0.00318						
26				SD of Detected Data	0.00623	0.00404						
27												
28				**Site vs Background Gehan Test**								
29												
30	**H0: Mean/Median of Site or AOC <= Mean/Median of background**											
31												
32				Gehan z Test Value	0.312							
33				Critical z (0.95)	1.645							
34				P-Value	0.377							
35												
36	**Conclusion with Alpha = 0.05**											
37	**Do Not Reject H0, Conclude Site <= Background**											
38	**P-Value >= alpha (0.05)**											
39												

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-26)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	149
Number of Non-Detect Data	12	45
Number of Detect Data	13	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.0278	0.00325
Percent Non detects	48.00%	30.20%
Minimum Detected	0.0037	0.00101
Maximum Detected	0.0342	0.0205
Mean of Detected Data	0.00856	0.00417
Median of Detected Data	0.0059	0.00318
SD of Detected Data	0.00845	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.348
Critical z (0.95)	1.645
P-Value	0.0004063

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-27-20)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	11	45
Number of Detect Data	11	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.02	0.00325
Percent Non detects	50.00%	30.20%
Minimum Detected	0.0033	0.00101
Maximum Detected	0.0961	0.0205
Mean of Detected Data	0.016	0.00417
Median of Detected Data	0.0075	0.00318
SD of Detected Data	0.027	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.13
Critical z (0.95)	1.645
P-Value	0.0008733

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-28-25)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	21	149
Number of Non-Detect Data	11	45
Number of Detect Data	10	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.02	0.00325
Percent Non detects	52.38%	30.20%
Minimum Detected	0.0032	0.00101
Maximum Detected	0.0269	0.0205
Mean of Detected Data	0.00818	0.00417
Median of Detected Data	0.0046	0.00318
SD of Detected Data	0.00757	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.598
Critical z (0.95)	1.645
P-Value	0.00468

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-29)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	10	45
Number of Detect Data	12	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	45.45%	30.20%
Minimum Detected	0.0031	0.00101
Maximum Detected	0.0187	0.0205
Mean of Detected Data	0.00875	0.00417
Median of Detected Data	0.0092	0.00318
SD of Detected Data	0.00511	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.234
Critical z (0.95)	1.645
P-Value	0.0006093

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-30-30)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	11	45
Number of Detect Data	11	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	50.00%	30.20%
Minimum Detected	0.0023	0.00101
Maximum Detected	0.2	0.0205
Mean of Detected Data	0.0252	0.00417
Median of Detected Data	0.0069	0.00318
SD of Detected Data	0.0583	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.959
Critical z (0.95)	1.645
P-Value	0.00154

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(mw-31-60)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	16	45
Number of Detect Data	7	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	69.57%	30.20%
Minimum Detected	0.0037	0.00101
Maximum Detected	0.05	0.0205
Mean of Detected Data	0.0197	0.00417
Median of Detected Data	0.01	0.00318
SD of Detected Data	0.0189	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.986
Critical z (0.95)	1.645
P-Value	0.0235

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(ow-5m)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	9	45
Number of Detect Data	5	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.01	0.00325
Percent Non detects	64.29%	30.20%
Minimum Detected	0.0016	0.00101
Maximum Detected	0.0114	0.0205
Mean of Detected Data	0.00654	0.00417
Median of Detected Data	0.0058	0.00318
SD of Detected Data	0.00434	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.792
Critical z (0.95)	1.645
P-Value	0.214

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(pge-6)

Background Data: Copper, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	7	45
Number of Detect Data	10	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.011	0.00325
Percent Non detects	41.18%	30.20%
Minimum Detected	0.0034	0.00101
Maximum Detected	0.047	0.0205
Mean of Detected Data	0.0126	0.00417
Median of Detected Data	0.006	0.00318
SD of Detected Data	0.0137	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.192
Critical z (0.95)	1.645
P-Value	0.0007065

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Fluoride(cw-2d)

Background Data: Fluoride(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	143
Number of Non-Detect Data	1	25
Number of Detect Data	7	118
Minimum Non-Detect	5	0.5
Maximum Non-Detect	5	0.5
Percent Non detects	12.50%	17.48%
Minimum Detected	0.982	0.525
Maximum Detected	7.26	4.34
Mean of Detected Data	3.025	1.698
Median of Detected Data	3.26	1.525
SD of Detected Data	2.165	1.024

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.123
Critical z (0.95)	1.645
P-Value	0.0169

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-9)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	35	148
Number of Non-Detect Data	0	38
Number of Detect Data	35	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.265	0.00022
Maximum Detected	0.402	0.0376
Mean of Detected Data	0.339	0.0102
Median of Detected Data	0.343	0.00885
SD of Detected Data	0.0285	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.246
Critical z (0.95)	1.645
P-Value	1.169E-20

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-10)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	37	148
Number of Non-Detect Data	0	38
Number of Detect Data	37	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.755	0.00022
Maximum Detected	4.57	0.0376
Mean of Detected Data	1.838	0.0102
Median of Detected Data	1.87	0.00885
SD of Detected Data	0.699	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.453
Critical z (0.95)	1.645
P-Value	1.645E-21

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-11)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	148
Number of Non-Detect Data	0	38
Number of Detect Data	34	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.02	0.00022
Maximum Detected	1.71	0.0376
Mean of Detected Data	0.599	0.0102
Median of Detected Data	0.465	0.00885
SD of Detected Data	0.348	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.08
Critical z (0.95)	1.645
P-Value	5.413E-20

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference (S)	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-12)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	40	148
Number of Non-Detect Data	0	38
Number of Detect Data	40	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.311	0.00022
Maximum Detected	2.97	0.0376
Mean of Detected Data	1.155	0.0102
Median of Detected Data	1.005	0.00885
SD of Detected Data	0.649	0.00844

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.001 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	6740
WMW Test U-Stat	9.692
WMW Critical Value (0.050)	1.645
P-Value	1.629E-22

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-14)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	37	148
Number of Non-Detect Data	1	38
Number of Detect Data	36	110
Minimum Non-Detect	0.01	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	2.70%	25.68%
Minimum Detected	0.01	0.00022
Maximum Detected	0.099	0.0376
Mean of Detected Data	0.0334	0.0102
Median of Detected Data	0.032	0.00885
SD of Detected Data	0.015	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	8.302
Critical z (0.95)	1.645
P-Value	5.106E-17

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-15)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	32	148
Number of Non-Detect Data	9	38
Number of Detect Data	23	110
Minimum Non-Detect	0.01	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	28.13%	25.68%
Minimum Detected	0.0076	0.00022
Maximum Detected	0.05	0.0376
Mean of Detected Data	0.0156	0.0102
Median of Detected Data	0.0121	0.00885
SD of Detected Data	0.00993	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.764
Critical z (0.95)	1.645
P-Value	0.00286

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-19)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	148
Number of Non-Detect Data	0	38
Number of Detect Data	34	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.557	0.00022
Maximum Detected	1.39	0.0376
Mean of Detected Data	0.839	0.0102
Median of Detected Data	0.756	0.00885
SD of Detected Data	0.21	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.138
Critical z (0.95)	1.645
P-Value	3.169E-20

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-20-70)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	39	148
Number of Non-Detect Data	0	38
Number of Detect Data	39	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	2.4	0.00022
Maximum Detected	13.2	0.0376
Mean of Detected Data	8.776	0.0102
Median of Detected Data	9	0.00885
SD of Detected Data	3.252	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.652
Critical z (0.95)	1.645
P-Value	2.419E-22

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-20-100)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	37	148
Number of Non-Detect Data	0	38
Number of Detect Data	37	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	1.35	0.00022
Maximum Detected	10.4	0.0376
Mean of Detected Data	5.12	0.0102
Median of Detected Data	3.09	0.00885
SD of Detected Data	3.186	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.453
Critical z (0.95)	1.645
P-Value	1.645E-21

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-20-130)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	38	148
Number of Non-Detect Data	0	38
Number of Detect Data	38	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	3.66	0.00022
Maximum Detected	14.4	0.0376
Mean of Detected Data	7.772	0.0102
Median of Detected Data	6.595	0.00885
SD of Detected Data	2.743	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.553
Critical z (0.95)	1.645
P-Value	6.274E-22

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-24a)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	32	148
Number of Non-Detect Data	0	38
Number of Detect Data	32	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	2.48	0.00022
Maximum Detected	4.3	0.0376
Mean of Detected Data	3.236	0.0102
Median of Detected Data	3.26	0.00885
SD of Detected Data	0.415	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	8.916
Critical z (0.95)	1.645
P-Value	2.411E-19

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-24b)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	148
Number of Non-Detect Data	0	38
Number of Detect Data	34	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.741	0.00022
Maximum Detected	6.12	0.0376
Mean of Detected Data	4.617	0.0102
Median of Detected Data	4.81	0.00885
SD of Detected Data	1.044	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.138
Critical z (0.95)	1.645
P-Value	3.169E-20

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-25)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	33	148
Number of Non-Detect Data	0	38
Number of Detect Data	33	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.933	0.00022
Maximum Detected	2.98	0.0376
Mean of Detected Data	2.186	0.0102
Median of Detected Data	2.35	0.00885
SD of Detected Data	0.598	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.029
Critical z (0.95)	1.645
P-Value	8.689E-20

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-26)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	35	148
Number of Non-Detect Data	1	38
Number of Detect Data	34	110
Minimum Non-Detect	0.01	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	2.86%	25.68%
Minimum Detected	0.759	0.00022
Maximum Detected	4.06	0.0376
Mean of Detected Data	3.027	0.0102
Median of Detected Data	3.385	0.00885
SD of Detected Data	0.981	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	8.925
Critical z (0.95)	1.645
P-Value	2.23E-19

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-30-50)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	45	148
Number of Non-Detect Data	11	38
Number of Detect Data	34	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.001	0.001
Percent Non detects	24.44%	25.68%
Minimum Detected	0.0185	0.00022
Maximum Detected	3.76	0.0376
Mean of Detected Data	1.419	0.0102
Median of Detected Data	1.57	0.00885
SD of Detected Data	0.907	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.956
Critical z (0.95)	1.645
P-Value	1.291E-09

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-31-60)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	36	148
Number of Non-Detect Data	0	38
Number of Detect Data	36	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.626	0.00022
Maximum Detected	4.52	0.0376
Mean of Detected Data	3.028	0.0102
Median of Detected Data	3.59	0.00885
SD of Detected Data	1.172	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.351
Critical z (0.95)	1.645
P-Value	4.361E-21

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-31-135)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	148
Number of Non-Detect Data	0	38
Number of Detect Data	14	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0332	0.00022
Maximum Detected	0.422	0.0376
Mean of Detected Data	0.221	0.0102
Median of Detected Data	0.244	0.00885
SD of Detected Data	0.133	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	6.211
Critical z (0.95)	1.645
P-Value	2.625E-10

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-34-100)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	79	148
Number of Non-Detect Data	0	38
Number of Detect Data	79	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0739	0.00022
Maximum Detected	0.976	0.0376
Mean of Detected Data	0.679	0.0102
Median of Detected Data	0.723	0.00885
SD of Detected Data	0.177	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	12.44
Critical z (0.95)	1.645
P-Value	7.682E-36

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-36-90)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	39	148
Number of Non-Detect Data	1	38
Number of Detect Data	38	110
Minimum Non-Detect	0.001	0.0002
Maximum Non-Detect	0.001	0.001
Percent Non detects	2.56%	25.68%
Minimum Detected	0.002	0.00022
Maximum Detected	3.66	0.0376
Mean of Detected Data	0.73	0.0102
Median of Detected Data	0.0524	0.00885
SD of Detected Data	1.16	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.417
Critical z (0.95)	1.645
P-Value	3.024E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-36-100)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	51	148
Number of Non-Detect Data	0	38
Number of Detect Data	51	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.157	0.00022
Maximum Detected	2.98	0.0376
Mean of Detected Data	1.027	0.0102
Median of Detected Data	0.556	0.00885
SD of Detected Data	0.859	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	10.69
Critical z (0.95)	1.645
P-Value	5.638E-27

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-37d)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	148
Number of Non-Detect Data	0	38
Number of Detect Data	15	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.834	0.00022
Maximum Detected	1.97	0.0376
Mean of Detected Data	1.417	0.0102
Median of Detected Data	1.39	0.00885
SD of Detected Data	0.348	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	6.427
Critical z (0.95)	1.645
P-Value	6.49E-11

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-38d)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	11	148
Number of Non-Detect Data	0	38
Number of Detect Data	11	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0331	0.00022
Maximum Detected	0.328	0.0376
Mean of Detected Data	0.164	0.0102
Median of Detected Data	0.111	0.00885
SD of Detected Data	0.1	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.556
Critical z (0.95)	1.645
P-Value	1.383E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-38s)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	11	148
Number of Non-Detect Data	0	38
Number of Detect Data	11	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.332	0.00022
Maximum Detected	0.964	0.0376
Mean of Detected Data	0.781	0.0102
Median of Detected Data	0.824	0.00885
SD of Detected Data	0.191	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.576
Critical z (0.95)	1.645
P-Value	1.229E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-39-50)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	18	148
Number of Non-Detect Data	6	38
Number of Detect Data	12	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	33.33%	25.68%
Minimum Detected	0.0662	0.00022
Maximum Detected	4.14	0.0376
Mean of Detected Data	1.61	0.0102
Median of Detected Data	1.235	0.00885
SD of Detected Data	1.394	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.35
Critical z (0.95)	1.645
P-Value	0.0004039

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-39-60)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	18	148
Number of Non-Detect Data	2	38
Number of Detect Data	16	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.001	0.001
Percent Non detects	11.11%	25.68%
Minimum Detected	0.0011	0.00022
Maximum Detected	3.81	0.0376
Mean of Detected Data	1.61	0.0102
Median of Detected Data	1.545	0.00885
SD of Detected Data	1.435	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.708
Critical z (0.95)	1.645
P-Value	1.25E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-39-70)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	148
Number of Non-Detect Data	0	38
Number of Detect Data	27	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0045	0.00022
Maximum Detected	8.21	0.0376
Mean of Detected Data	2.336	0.0102
Median of Detected Data	0.799	0.00885
SD of Detected Data	2.851	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	7.682
Critical z (0.95)	1.645
P-Value	7.815E-15

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-39-80)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	40	148
Number of Non-Detect Data	0	38
Number of Detect Data	40	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0433	0.00022
Maximum Detected	10.9	0.0376
Mean of Detected Data	3.033	0.0102
Median of Detected Data	1.585	0.00885
SD of Detected Data	3.448	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.748
Critical z (0.95)	1.645
P-Value	9.423E-23

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-39-100)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	41	148
Number of Non-Detect Data	0	38
Number of Detect Data	41	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	1.66	0.00022
Maximum Detected	12.9	0.0376
Mean of Detected Data	5.536	0.0102
Median of Detected Data	4.01	0.00885
SD of Detected Data	3.428	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	9.842
Critical z (0.95)	1.645
P-Value	3.709E-23

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-40d)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	148
Number of Non-Detect Data	0	38
Number of Detect Data	15	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0076	0.00022
Maximum Detected	0.112	0.0376
Mean of Detected Data	0.068	0.0102
Median of Detected Data	0.078	0.00885
SD of Detected Data	0.0336	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.993
Critical z (0.95)	1.645
P-Value	1.029E-09

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-44-115)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	32	148
Number of Non-Detect Data	0	38
Number of Detect Data	32	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.62	0.00022
Maximum Detected	1.71	0.0376
Mean of Detected Data	1.255	0.0102
Median of Detected Data	1.27	0.00885
SD of Detected Data	0.302	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	8.916
Critical z (0.95)	1.645
P-Value	2.411E-19

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-44-125)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	29	148
Number of Non-Detect Data	0	38
Number of Detect Data	29	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.157	0.00022
Maximum Detected	0.634	0.0376
Mean of Detected Data	0.339	0.0102
Median of Detected Data	0.3	0.00885
SD of Detected Data	0.122	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	8.562
Critical z (0.95)	1.645
P-Value	5.542E-18

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-46-175)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	29	148
Number of Non-Detect Data	0	38
Number of Detect Data	29	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0779	0.00022
Maximum Detected	0.287	0.0376
Mean of Detected Data	0.159	0.0102
Median of Detected Data	0.153	0.00885
SD of Detected Data	0.0548	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	8.562
Critical z (0.95)	1.645
P-Value	5.542E-18

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-47-55)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	38
Number of Detect Data	8	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.0109	0.00022
Maximum Detected	0.0619	0.0376
Mean of Detected Data	0.0418	0.0102
Median of Detected Data	0.0447	0.00885
SD of Detected Data	0.0194	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.389
Critical z (0.95)	1.645
P-Value	5.682E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Hexavalent chromium(mw-50-095)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	38
Number of Detect Data	8	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.164	0.00022
Maximum Detected	0.304	0.0376
Mean of Detected Data	0.241	0.0102
Median of Detected Data	0.246	0.00885
SD of Detected Data	0.0482	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.803
Critical z (0.95)	1.645
P-Value	7.806E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(mw-50-200)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	38
Number of Detect Data	8	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	5.81	0.00022
Maximum Detected	12.3	0.0376
Mean of Detected Data	9.556	0.0102
Median of Detected Data	9.88	0.00885
SD of Detected Data	1.994	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.803
Critical z (0.95)	1.645
P-Value	7.806E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(ow-2s)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	148
Number of Non-Detect Data	1	38
Number of Detect Data	15	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.0002	0.001
Percent Non detects	6.25%	25.68%
Minimum Detected	0.0153	0.00022
Maximum Detected	0.0404	0.0376
Mean of Detected Data	0.0318	0.0102
Median of Detected Data	0.0348	0.00885
SD of Detected Data	0.00736	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.48
Critical z (0.95)	1.645
P-Value	2.126E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(pe-1)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	24	148
Number of Non-Detect Data	3	38
Number of Detect Data	21	110
Minimum Non-Detect	0.001	0.0002
Maximum Non-Detect	0.001	0.001
Percent Non detects	12.50%	25.68%
Minimum Detected	0.0471	0.00022
Maximum Detected	0.148	0.0376
Mean of Detected Data	0.0941	0.0102
Median of Detected Data	0.0925	0.00885
SD of Detected Data	0.0321	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	6.264
Critical z (0.95)	1.645
P-Value	1.882E-10

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(pge-6)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	18	148
Number of Non-Detect Data	5	38
Number of Detect Data	13	110
Minimum Non-Detect	0.01	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	27.78%	25.68%
Minimum Detected	0.16	0.00022
Maximum Detected	3.1	0.0376
Mean of Detected Data	1.072	0.0102
Median of Detected Data	0.787	0.00885
SD of Detected Data	0.86	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.533
Critical z (0.95)	1.645
P-Value	2.912E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(pge-7)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	148
Number of Non-Detect Data	1	38
Number of Detect Data	15	110
Minimum Non-Detect	0.001	0.0002
Maximum Non-Detect	0.001	0.001
Percent Non detects	6.25%	25.68%
Minimum Detected	0.827	0.00022
Maximum Detected	5.4	0.0376
Mean of Detected Data	4.208	0.0102
Median of Detected Data	4.53	0.00885
SD of Detected Data	1.22	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.929
Critical z (0.95)	1.645
P-Value	1.526E-09

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(tw-2d)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	12	148
Number of Non-Detect Data	0	38
Number of Detect Data	12	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	0.21	0.00022
Maximum Detected	7.41	0.0376
Mean of Detected Data	3.243	0.0102
Median of Detected Data	1.805	0.00885
SD of Detected Data	2.595	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.805
Critical z (0.95)	1.645
P-Value	3.218E-09

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(tw-2s)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	10	148
Number of Non-Detect Data	0	38
Number of Detect Data	10	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	1.25	0.00022
Maximum Detected	7.19	0.0376
Mean of Detected Data	3.792	0.0102
Median of Detected Data	3.57	0.00885
SD of Detected Data	1.854	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.334
Critical z (0.95)	1.645
P-Value	4.795E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(tw-3d)

Background Data: Hexavalent chromium(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	148
Number of Non-Detect Data	0	38
Number of Detect Data	22	110
Minimum Non-Detect	N/A	0.0002
Maximum Non-Detect	N/A	0.001
Percent Non detects	0.00%	25.68%
Minimum Detected	1.93	0.00022
Maximum Detected	4.33	0.0376
Mean of Detected Data	2.634	0.0102
Median of Detected Data	2.495	0.00885
SD of Detected Data	0.553	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	7.615
Critical z (0.95)	1.645
P-Value	1.317E-14

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Lead, dissolved(mw-10)

Background Data: Lead, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	147
Number of Non-Detect Data	11	125
Number of Detect Data	6	22
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.005	0.001
Percent Non detects	64.71%	85.03%
Minimum Detected	0.00106	0.00102
Maximum Detected	0.008	0.00409
Mean of Detected Data	0.00255	0.00199
Median of Detected Data	0.00153	0.00162
SD of Detected Data	0.00269	0.0009179

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.743
Critical z (0.95)	1.645
P-Value	0.00305

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(mw-3)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	12	149
Number of Non-Detect Data	1	1
Number of Detect Data	11	148
Minimum Non-Detect	0.05	0.00758
Maximum Non-Detect	0.05	0.00758
Percent Non detects	8.33%	0.67%
Minimum Detected	0.025	0.0035
Maximum Detected	0.041	0.0417
Mean of Detected Data	0.0314	0.0113
Median of Detected Data	0.0293	0.00866
SD of Detected Data	0.00509	0.00752

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.994
Critical z (0.95)	1.645
P-Value	2.95E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(mw-5)

Background Data: Molybdenum, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	12	149
Number of Non-Detect Data	1	1
Number of Detect Data	11	148
Minimum Non-Detect	0.05	0.00758
Maximum Non-Detect	0.05	0.00758
Percent Non detects	8.33%	0.67%
Minimum Detected	0.039	0.0035
Maximum Detected	0.15	0.0417
Mean of Detected Data	0.0528	0.0113
Median of Detected Data	0.041	0.00866
SD of Detected Data	0.0326	0.00752

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.292
Critical z (0.95)	1.645
P-Value	6.05E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-9)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	12	96
Number of Detect Data	15	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	44.44%	64.43%
Minimum Detected	0.0014	0.001
Maximum Detected	0.0297	0.0415
Mean of Detected Data	0.00675	0.0042
Median of Detected Data	0.003	0.00202
SD of Detected Data	0.00784	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.336
Critical z (0.95)	1.645
P-Value	7.269E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-10)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	39	149
Number of Non-Detect Data	19	96
Number of Detect Data	20	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	48.72%	64.43%
Minimum Detected	0.00165	0.001
Maximum Detected	0.033	0.0415
Mean of Detected Data	0.00592	0.0042
Median of Detected Data	0.0034	0.00202
SD of Detected Data	0.0074	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.683
Critical z (0.95)	1.645
P-Value	1.417E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-11)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	35	149
Number of Non-Detect Data	19	96
Number of Detect Data	16	53
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	54.29%	64.43%
Minimum Detected	0.00096	0.001
Maximum Detected	0.0203	0.0415
Mean of Detected Data	0.00689	0.0042
Median of Detected Data	0.0053	0.00202
SD of Detected Data	0.00579	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.329
Critical z (0.95)	1.645
P-Value	0.0004351

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-12)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	41	149
Number of Non-Detect Data	21	96
Number of Detect Data	20	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	51.22%	64.43%
Minimum Detected	0.0013	0.001
Maximum Detected	0.0179	0.0415
Mean of Detected Data	0.00552	0.0042
Median of Detected Data	0.00386	0.00202
SD of Detected Data	0.00457	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.732
Critical z (0.95)	1.645
P-Value	1.109E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-13)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	8	96
Number of Detect Data	19	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	29.63%	64.43%
Minimum Detected	0.0035	0.001
Maximum Detected	0.168	0.0415
Mean of Detected Data	0.0169	0.0042
Median of Detected Data	0.0081	0.00202
SD of Detected Data	0.0369	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	6.212
Critical z (0.95)	1.645
P-Value	2.618E-10

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-14)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	149
Number of Non-Detect Data	9	96
Number of Detect Data	17	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	34.62%	64.43%
Minimum Detected	0.0013	0.001
Maximum Detected	0.0397	0.0415
Mean of Detected Data	0.011	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.0109	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.308
Critical z (0.95)	1.645
P-Value	5.539E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-15)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	24	149
Number of Non-Detect Data	10	96
Number of Detect Data	14	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	41.67%	64.43%
Minimum Detected	0.0014	0.001
Maximum Detected	0.028	0.0415
Mean of Detected Data	0.00618	0.0042
Median of Detected Data	0.00309	0.00202
SD of Detected Data	0.00719	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.324
Critical z (0.95)	1.645
P-Value	7.656E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-19)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	12	96
Number of Detect Data	10	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	54.55%	64.43%
Minimum Detected	0.0012	0.001
Maximum Detected	0.0202	0.0415
Mean of Detected Data	0.00566	0.0042
Median of Detected Data	0.0033	0.00202
SD of Detected Data	0.00588	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.096
Critical z (0.95)	1.645
P-Value	0.0009816

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-20-70)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	36	149
Number of Non-Detect Data	21	96
Number of Detect Data	15	53
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	58.33%	64.43%
Minimum Detected	0.0012	0.001
Maximum Detected	0.029	0.0415
Mean of Detected Data	0.00742	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.00779	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.203
Critical z (0.95)	1.645
P-Value	0.0006798

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-20-100)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	10	96
Number of Detect Data	13	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	43.48%	64.43%
Minimum Detected	0.0011	0.001
Maximum Detected	0.13	0.0415
Mean of Detected Data	0.0161	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.0346	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.256
Critical z (0.95)	1.645
P-Value	1.04E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-20-130)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	149
Number of Non-Detect Data	20	96
Number of Detect Data	14	53
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	58.82%	64.43%
Minimum Detected	0.00079	0.001
Maximum Detected	0.25	0.0415
Mean of Detected Data	0.0264	0.0042
Median of Detected Data	0.0052	0.00202
SD of Detected Data	0.0649	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.877
Critical z (0.95)	1.645
P-Value	0.00201

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-21)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	149
Number of Non-Detect Data	5	96
Number of Detect Data	20	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.025	0.00628
Percent Non detects	20.00%	64.43%
Minimum Detected	0.0017	0.001
Maximum Detected	0.158	0.0415
Mean of Detected Data	0.0244	0.0042
Median of Detected Data	0.0158	0.00202
SD of Detected Data	0.0347	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	6.661
Critical z (0.95)	1.645
P-Value	1.358E-11

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-22)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	149
Number of Non-Detect Data	10	96
Number of Detect Data	17	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	37.04%	64.43%
Minimum Detected	0.0013	0.001
Maximum Detected	0.5	0.0415
Mean of Detected Data	0.0479	0.0042
Median of Detected Data	0.014	0.00202
SD of Detected Data	0.12	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.562
Critical z (0.95)	1.645
P-Value	1.334E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-23)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	149
Number of Non-Detect Data	11	96
Number of Detect Data	15	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.025	0.00628
Percent Non detects	42.31%	64.43%
Minimum Detected	0.0015	0.001
Maximum Detected	0.25	0.0415
Mean of Detected Data	0.0327	0.0042
Median of Detected Data	0.0189	0.00202
SD of Detected Data	0.0615	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.978
Critical z (0.95)	1.645
P-Value	3.205E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-24a)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	149
Number of Non-Detect Data	14	96
Number of Detect Data	11	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	56.00%	64.43%
Minimum Detected	0.0013	0.001
Maximum Detected	0.0225	0.0415
Mean of Detected Data	0.00554	0.0042
Median of Detected Data	0.0045	0.00202
SD of Detected Data	0.00585	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.364
Critical z (0.95)	1.645
P-Value	0.0003839

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-24b)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	11	96
Number of Detect Data	12	53
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	47.83%	64.43%
Minimum Detected	0.00069	0.001
Maximum Detected	0.053	0.0415
Mean of Detected Data	0.0102	0.0042
Median of Detected Data	0.00455	0.00202
SD of Detected Data	0.0159	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.891
Critical z (0.95)	1.645
P-Value	0.00192

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-24br)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	11	96
Number of Detect Data	11	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	50.00%	64.43%
Minimum Detected	0.0017	0.001
Maximum Detected	0.0172	0.0415
Mean of Detected Data	0.00547	0.0042
Median of Detected Data	0.0034	0.00202
SD of Detected Data	0.00481	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.604
Critical z (0.95)	1.645
P-Value	0.0001566

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-25)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	29	149
Number of Non-Detect Data	14	96
Number of Detect Data	15	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	48.28%	64.43%
Minimum Detected	0.00122	0.001
Maximum Detected	0.0213	0.0415
Mean of Detected Data	0.00467	0.0042
Median of Detected Data	0.0031	0.00202
SD of Detected Data	0.00507	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.966
Critical z (0.95)	1.645
P-Value	3.647E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-26)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	149
Number of Non-Detect Data	14	96
Number of Detect Data	11	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	56.00%	64.43%
Minimum Detected	0.0014	0.001
Maximum Detected	0.0183	0.0415
Mean of Detected Data	0.0068	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.00609	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.522
Critical z (0.95)	1.645
P-Value	0.0002145

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-27-20)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	10	96
Number of Detect Data	12	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	45.45%	64.43%
Minimum Detected	0.0014	0.001
Maximum Detected	0.11	0.0415
Mean of Detected Data	0.0183	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.0336	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.089
Critical z (0.95)	1.645
P-Value	2.163E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-28-25)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	21	149
Number of Non-Detect Data	11	96
Number of Detect Data	10	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	52.38%	64.43%
Minimum Detected	0.0022	0.001
Maximum Detected	0.0206	0.0415
Mean of Detected Data	0.00742	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.00515	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.765
Critical z (0.95)	1.645
P-Value	8.314E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-29)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	8	96
Number of Detect Data	14	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	36.36%	64.43%
Minimum Detected	0.0015	0.001
Maximum Detected	0.0213	0.0415
Mean of Detected Data	0.00772	0.0042
Median of Detected Data	0.0051	0.00202
SD of Detected Data	0.00625	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.862
Critical z (0.95)	1.645
P-Value	5.801E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-30-30)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	149
Number of Non-Detect Data	7	96
Number of Detect Data	15	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	31.82%	64.43%
Minimum Detected	0.0017	0.001
Maximum Detected	0.5	0.0415
Mean of Detected Data	0.0509	0.0042
Median of Detected Data	0.017	0.00202
SD of Detected Data	0.125	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.401
Critical z (0.95)	1.645
P-Value	3.314E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-31-60)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	149
Number of Non-Detect Data	11	96
Number of Detect Data	12	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0278	0.00628
Percent Non detects	47.83%	64.43%
Minimum Detected	0.0017	0.001
Maximum Detected	0.13	0.0415
Mean of Detected Data	0.014	0.0042
Median of Detected Data	0.00225	0.00202
SD of Detected Data	0.0366	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.568
Critical z (0.95)	1.645
P-Value	0.0001796

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-34-55)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	8	96
Number of Detect Data	6	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0261	0.00628
Percent Non detects	57.14%	64.43%
Minimum Detected	0.00122	0.001
Maximum Detected	0.0223	0.0415
Mean of Detected Data	0.0101	0.0042
Median of Detected Data	0.00694	0.00202
SD of Detected Data	0.00914	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.502
Critical z (0.95)	1.645
P-Value	0.00617

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(mw-34-80)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	18	149
Number of Non-Detect Data	7	96
Number of Detect Data	11	53
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.0261	0.00628
Percent Non detects	38.89%	64.43%
Minimum Detected	0.001	0.001
Maximum Detected	0.0222	0.0415
Mean of Detected Data	0.00591	0.0042
Median of Detected Data	0.00223	0.00202
SD of Detected Data	0.00697	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.476
Critical z (0.95)	1.645
P-Value	0.0002543

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(pge-6)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	7	96
Number of Detect Data	10	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	41.18%	64.43%
Minimum Detected	0.00091	0.001
Maximum Detected	0.014	0.0415
Mean of Detected Data	0.00406	0.0042
Median of Detected Data	0.002	0.00202
SD of Detected Data	0.00402	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.928
Critical z (0.95)	1.645
P-Value	0.0017

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(pge-7)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	149
Number of Non-Detect Data	6	96
Number of Detect Data	9	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	40.00%	64.43%
Minimum Detected	0.0015	0.001
Maximum Detected	0.015	0.0415
Mean of Detected Data	0.0048	0.0042
Median of Detected Data	0.0019	0.00202
SD of Detected Data	0.00477	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.326
Critical z (0.95)	1.645
P-Value	0.0004411

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(pge-8)

Background Data: Nickel, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	8	96
Number of Detect Data	9	53
Minimum Non-Detect	0.02	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	47.06%	64.43%
Minimum Detected	0.0012	0.001
Maximum Detected	0.045	0.0415
Mean of Detected Data	0.0101	0.0042
Median of Detected Data	0.0037	0.00202
SD of Detected Data	0.0141	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.429
Critical z (0.95)	1.645
P-Value	0.0003031

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(cw-1d)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	30
Number of Detect Data	8	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	0.566	0.687
Maximum Detected	3.78	4.75
Mean of Detected Data	1.916	2.587
Median of Detected Data	1.705	2.52
SD of Detected Data	1.263	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.25
Critical z (0.95)	1.645
P-Value	0.599

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Nitrate as Nitrogen(cw-1m)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	30
Number of Detect Data	8	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	0.832	0.687
Maximum Detected	2.31	4.75
Mean of Detected Data	1.455	2.587
Median of Detected Data	1.495	2.52
SD of Detected Data	0.48	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.774
Critical z (0.95)	1.645
P-Value	0.962

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(cw-2d)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	1	30
Number of Detect Data	7	118
Minimum Non-Detect	0.5	0.1
Maximum Non-Detect	0.5	0.5
Percent Non detects	12.50%	20.27%
Minimum Detected	0.28	0.687
Maximum Detected	2.69	4.75
Mean of Detected Data	1.032	2.587
Median of Detected Data	0.385	2.52
SD of Detected Data	0.975	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-2.44
Critical z (0.95)	1.645
P-Value	0.993

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(cw-2m)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	30
Number of Detect Data	8	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	0.703	0.687
Maximum Detected	1.09	4.75
Mean of Detected Data	0.951	2.587
Median of Detected Data	0.98	2.52
SD of Detected Data	0.131	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-2.588
Critical z (0.95)	1.645
P-Value	0.995

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(cw-3d)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	1	30
Number of Detect Data	7	118
Minimum Non-Detect	0.5	0.1
Maximum Non-Detect	0.5	0.5
Percent Non detects	12.50%	20.27%
Minimum Detected	0.251	0.687
Maximum Detected	2.62	4.75
Mean of Detected Data	0.77	2.587
Median of Detected Data	0.333	2.52
SD of Detected Data	0.883	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-2.975
Critical z (0.95)	1.645
P-Value	0.999

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(cw-3m)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	30
Number of Detect Data	8	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	0.594	0.687
Maximum Detected	5.98	4.75
Mean of Detected Data	1.387	2.587
Median of Detected Data	0.789	2.52
SD of Detected Data	1.859	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.782
Critical z (0.95)	1.645
P-Value	0.963

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(cw-4d)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	1	30
Number of Detect Data	7	118
Minimum Non-Detect	0.5	0.1
Maximum Non-Detect	0.5	0.5
Percent Non detects	12.50%	20.27%
Minimum Detected	0.188	0.687
Maximum Detected	1.28	4.75
Mean of Detected Data	0.586	2.587
Median of Detected Data	0.417	2.52
SD of Detected Data	0.471	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-3.436
Critical z (0.95)	1.645
P-Value	1

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(cw-4m)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	1	30
Number of Detect Data	7	118
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.5
Percent Non detects	12.50%	20.27%
Minimum Detected	1.18	0.687
Maximum Detected	1.96	4.75
Mean of Detected Data	1.589	2.587
Median of Detected Data	1.55	2.52
SD of Detected Data	0.253	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.96
Critical z (0.95)	1.645
P-Value	0.975

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(mw-11)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	30
Number of Detect Data	8	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	0.519	0.687
Maximum Detected	16.4	4.75
Mean of Detected Data	6.898	2.587
Median of Detected Data	8.37	2.52
SD of Detected Data	5.289	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.443
Critical z (0.95)	1.645
P-Value	0.00728

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(mw-14)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	30
Number of Detect Data	8	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	1.106	0.687
Maximum Detected	5.74	4.75
Mean of Detected Data	3.884	2.587
Median of Detected Data	5.275	2.52
SD of Detected Data	2.207	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.056
Critical z (0.95)	1.645
P-Value	0.0199

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(mw-20-70)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	20	148
Number of Non-Detect Data	0	30
Number of Detect Data	20	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	2.484	0.687
Maximum Detected	25.1	4.75
Mean of Detected Data	10.55	2.587
Median of Detected Data	9.835	2.52
SD of Detected Data	4.533	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	6.842
Critical z (0.95)	1.645
P-Value	3.901E-12

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(mw-20-100)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	19	148
Number of Non-Detect Data	0	30
Number of Detect Data	19	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	2.935	0.687
Maximum Detected	23.2	4.75
Mean of Detected Data	9.501	2.587
Median of Detected Data	9.6	2.52
SD of Detected Data	4.593	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	6.571
Critical z (0.95)	1.645
P-Value	2.499E-11

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(mw-20-130)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	19	148
Number of Non-Detect Data	0	30
Number of Detect Data	19	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	6.097	0.687
Maximum Detected	20.4	4.75
Mean of Detected Data	10.04	2.587
Median of Detected Data	10.6	2.52
SD of Detected Data	3.195	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	7.107
Critical z (0.95)	1.645
P-Value	5.938E-13

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(mw-24b)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	0	30
Number of Detect Data	8	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	3.161	0.687
Maximum Detected	16	4.75
Mean of Detected Data	11	2.587
Median of Detected Data	11.8	2.52
SD of Detected Data	4.456	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.515
Critical z (0.95)	1.645
P-Value	3.159E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\IRIS\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_da	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(mw-25)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	148
Number of Non-Detect Data	0	30
Number of Detect Data	16	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	1.219	0.687
Maximum Detected	4.58	4.75
Mean of Detected Data	3.514	2.587
Median of Detected Data	3.935	2.52
SD of Detected Data	1.076	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.941
Critical z (0.95)	1.645
P-Value	4.053E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(mw-26)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	148
Number of Non-Detect Data	0	30
Number of Detect Data	17	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	1.332	0.687
Maximum Detected	7.84	4.75
Mean of Detected Data	4.678	2.587
Median of Detected Data	4.9	2.52
SD of Detected Data	1.624	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.231
Critical z (0.95)	1.645
P-Value	8.42E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(mw-30-50)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	12	148
Number of Non-Detect Data	7	30
Number of Detect Data	5	118
Minimum Non-Detect	0.5	0.1
Maximum Non-Detect	0.5	0.5
Percent Non detects	58.33%	20.27%
Minimum Detected	0.28	0.687
Maximum Detected	3.7	4.75
Mean of Detected Data	2.064	2.587
Median of Detected Data	1.64	2.52
SD of Detected Data	1.487	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-2.844
Critical z (0.95)	1.645
P-Value	0.998

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Nitrate as Nitrogen(mw-31-60)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	148
Number of Non-Detect Data	0	30
Number of Detect Data	17	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	1.784	0.687
Maximum Detected	6.2	4.75
Mean of Detected Data	4.466	2.587
Median of Detected Data	4.93	2.52
SD of Detected Data	1.281	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.328
Critical z (0.95)	1.645
P-Value	4.966E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(mw-34-100)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	8	148
Number of Non-Detect Data	1	30
Number of Detect Data	7	118
Minimum Non-Detect	1	0.1
Maximum Non-Detect	1	0.5
Percent Non detects	12.50%	20.27%
Minimum Detected	0.786	0.687
Maximum Detected	1.39	4.75
Mean of Detected Data	1.192	2.587
Median of Detected Data	1.21	2.52
SD of Detected Data	0.217	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-2.598
Critical z (0.95)	1.645
P-Value	0.995

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(ow-1d)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	148
Number of Non-Detect Data	0	30
Number of Detect Data	16	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	0.252	0.687
Maximum Detected	3.44	4.75
Mean of Detected Data	2.006	2.587
Median of Detected Data	2.35	2.52
SD of Detected Data	1.183	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.00557
Critical z (0.95)	1.645
P-Value	0.502

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Nitrate as Nitrogen(ow-1m)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	148
Number of Non-Detect Data	0	30
Number of Detect Data	16	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	0.892	0.687
Maximum Detected	6.49	4.75
Mean of Detected Data	2.49	2.587
Median of Detected Data	2.505	2.52
SD of Detected Data	1.471	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.556
Critical z (0.95)	1.645
P-Value	0.289

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\IRIS\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_da	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(ow-1s)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	148
Number of Non-Detect Data	0	30
Number of Detect Data	14	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	1.68	0.687
Maximum Detected	4.02	4.75
Mean of Detected Data	3.049	2.587
Median of Detected Data	3.17	2.52
SD of Detected Data	0.558	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.816
Critical z (0.95)	1.645
P-Value	0.00243

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	A	B	C	D	E	F	G	H	I	J	K	L
1				**Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects**								
2			**User Selected Options**									
3			From File	\\irisdata\IRIS\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_da								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Substantial Difference	0								
7			Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)								
8			Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median								
9												
10												
11	**Area of Concern Data: Nitrate as Nitrogen(ow-2d)**											
12	**Background Data: Nitrate as Nitrogen(1)**											
13												
14				**Raw Statistics**								
15					Site	Background						
16			Number of Valid Data		15	148						
17			Number of Non-Detect Data		1	30						
18			Number of Detect Data		14	118						
19			Minimum Non-Detect		0.1	0.1						
20			Maximum Non-Detect		0.1	0.5						
21			Percent Non detects		6.67%	20.27%						
22			Minimum Detected		0.107	0.687						
23			Maximum Detected		7.57	4.75						
24			Mean of Detected Data		3.152	2.587						
25			Median of Detected Data		2.94	2.52						
26			SD of Detected Data		1.534	0.984						
27												
28				**Site vs Background Gehan Test**								
29												
30	**H0: Mean/Median of Site or AOC <= Mean/Median of background**											
31												
32			Gehan z Test Value		2.086							
33			Critical z (0.95)		1.645							
34			P-Value		0.0185							
35												
36	**Conclusion with Alpha = 0.05**											
37	**Reject H0, Conclude Site > Background**											
38	**P-Value < alpha (0.05)**											
39												

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(ow-2m)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	148
Number of Non-Detect Data	0	30
Number of Detect Data	15	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	0.574	0.687
Maximum Detected	7.16	4.75
Mean of Detected Data	2.804	2.587
Median of Detected Data	2.62	2.52
SD of Detected Data	1.573	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.653
Critical z (0.95)	1.645
P-Value	0.0492

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(ow-2s)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	148
Number of Non-Detect Data	0	30
Number of Detect Data	14	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	3.24	0.687
Maximum Detected	7.75	4.75
Mean of Detected Data	4.384	2.587
Median of Detected Data	4.038	2.52
SD of Detected Data	1.162	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.214
Critical z (0.95)	1.645
P-Value	9.223E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(ow-5d)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	148
Number of Non-Detect Data	0	30
Number of Detect Data	15	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	0.151	0.687
Maximum Detected	5.99	4.75
Mean of Detected Data	2.146	2.587
Median of Detected Data	2.615	2.52
SD of Detected Data	1.572	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.0519
Critical z (0.95)	1.645
P-Value	0.521

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Nitrate as Nitrogen(ow-5m)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	148
Number of Non-Detect Data	0	30
Number of Detect Data	15	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	0.51	0.687
Maximum Detected	8.155	4.75
Mean of Detected Data	1.964	2.587
Median of Detected Data	1.4	2.52
SD of Detected Data	1.939	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.875
Critical z (0.95)	1.645
P-Value	0.809

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Nitrate as Nitrogen(ow-5s)

Background Data: Nitrate as Nitrogen(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	148
Number of Non-Detect Data	0	30
Number of Detect Data	15	118
Minimum Non-Detect	N/A	0.1
Maximum Non-Detect	N/A	0.5
Percent Non detects	0.00%	20.27%
Minimum Detected	1.74	0.687
Maximum Detected	7.67	4.75
Mean of Detected Data	3.851	2.587
Median of Detected Data	3.66	2.52
SD of Detected Data	1.33	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.221
Critical z (0.95)	1.645
P-Value	1.214E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Selenium, dissolved(mw-10)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	4	45
Number of Detect Data	10	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	28.57%	30.20%
Minimum Detected	0.00193	0.001
Maximum Detected	0.02	0.0136
Mean of Detected Data	0.0055	0.0029
Median of Detected Data	0.00399	0.00199
SD of Detected Data	0.00517	0.0027

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.463
Critical z (0.95)	1.645
P-Value	0.0002669

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Selenium, dissolved(mw-11)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	10	149
Number of Non-Detect Data	3	45
Number of Detect Data	7	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	30.00%	30.20%
Minimum Detected	0.0045	0.001
Maximum Detected	0.0136	0.0136
Mean of Detected Data	0.00669	0.0029
Median of Detected Data	0.00573	0.00199
SD of Detected Data	0.00309	0.0027

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.472
Critical z (0.95)	1.645
P-Value	0.0002581

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\IRIS\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemic	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Selenium, dissolved(mw-20-70)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	4	45
Number of Detect Data	9	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	30.77%	30.20%
Minimum Detected	0.00783	0.001
Maximum Detected	0.0181	0.0136
Mean of Detected Data	0.0111	0.0029
Median of Detected Data	0.0111	0.00199
SD of Detected Data	0.00298	0.0027

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.929
Critical z (0.95)	1.645
P-Value	4.27E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Selenium, dissolved(mw-20-130)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	12	149
Number of Non-Detect Data	1	45
Number of Detect Data	11	104
Minimum Non-Detect	0.01	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	8.33%	30.20%
Minimum Detected	0.0107	0.001
Maximum Detected	0.023	0.0136
Mean of Detected Data	0.0142	0.0029
Median of Detected Data	0.013	0.00199
SD of Detected Data	0.0037	0.0027

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.158
Critical z (0.95)	1.645
P-Value	1.25E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Selenium, dissolved(mw-25)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	10	149
Number of Non-Detect Data	3	45
Number of Detect Data	7	104
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	30.00%	30.20%
Minimum Detected	0.00204	0.001
Maximum Detected	0.0131	0.0136
Mean of Detected Data	0.00395	0.0029
Median of Detected Data	0.00238	0.00199
SD of Detected Data	0.00404	0.0027

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.927
Critical z (0.95)	1.645
P-Value	0.027

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Selenium, dissolved(ow-2d)

Background Data: Selenium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	9	45
Number of Detect Data	5	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.01	0.001
Percent Non detects	64.29%	30.20%
Minimum Detected	0.00208	0.001
Maximum Detected	0.0171	0.0136
Mean of Detected Data	0.00676	0.0029
Median of Detected Data	0.0056	0.00199
SD of Detected Data	0.00608	0.0027

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.234
Critical z (0.95)	1.645
P-Value	0.109

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\IRIS\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemic	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(mw-10)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	149
Number of Non-Detect Data	0	22
Number of Detect Data	17	127
Minimum Non-Detect	N/A	0.001
Maximum Non-Detect	N/A	0.0193
Percent Non detects	0.00%	14.77%
Minimum Detected	0.02	0.00102
Maximum Detected	0.165	0.0803
Mean of Detected Data	0.0443	0.0162
Median of Detected Data	0.0379	0.0131
SD of Detected Data	0.0321	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	6.037
Critical z (0.95)	1.645
P-Value	7.867E-10

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(mw-11)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	0	22
Number of Detect Data	13	127
Minimum Non-Detect	N/A	0.001
Maximum Non-Detect	N/A	0.0193
Percent Non detects	0.00%	14.77%
Minimum Detected	0.0036	0.00102
Maximum Detected	0.0859	0.0803
Mean of Detected Data	0.0148	0.0162
Median of Detected Data	0.00831	0.0131
SD of Detected Data	0.0219	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.894
Critical z (0.95)	1.645
P-Value	0.814

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\IRIS\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemic	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(mw-12)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	20	149
Number of Non-Detect Data	0	22
Number of Detect Data	20	127
Minimum Non-Detect	N/A	0.001
Maximum Non-Detect	N/A	0.0193
Percent Non detects	0.00%	14.77%
Minimum Detected	0.009	0.00102
Maximum Detected	0.218	0.0803
Mean of Detected Data	0.0401	0.0162
Median of Detected Data	0.0308	0.0131
SD of Detected Data	0.0431	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.579
Critical z (0.95)	1.645
P-Value	1.206E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(mw-20-70)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	16	149
Number of Non-Detect Data	1	22
Number of Detect Data	15	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.003	0.0193
Percent Non detects	6.25%	14.77%
Minimum Detected	0.0034	0.00102
Maximum Detected	0.117	0.0803
Mean of Detected Data	0.0229	0.0162
Median of Detected Data	0.00961	0.0131
SD of Detected Data	0.0339	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.446
Critical z (0.95)	1.645
P-Value	0.672

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(mw-20-130)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	149
Number of Non-Detect Data	4	22
Number of Detect Data	11	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.01	0.0193
Percent Non detects	26.67%	14.77%
Minimum Detected	0.0028	0.00102
Maximum Detected	0.172	0.0803
Mean of Detected Data	0.0291	0.0162
Median of Detected Data	0.00413	0.0131
SD of Detected Data	0.0553	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-2.288
Critical z (0.95)	1.645
P-Value	0.989

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(mw-25)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	2	22
Number of Detect Data	11	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.003	0.0193
Percent Non detects	15.38%	14.77%
Minimum Detected	0.0051	0.00102
Maximum Detected	0.0733	0.0803
Mean of Detected Data	0.0157	0.0162
Median of Detected Data	0.0112	0.0131
SD of Detected Data	0.0193	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.065
Critical z (0.95)	1.645
P-Value	0.857

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(mw-34-55)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	9	149
Number of Non-Detect Data	4	22
Number of Detect Data	5	127
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	44.44%	14.77%
Minimum Detected	0.00115	0.00102
Maximum Detected	0.227	0.0803
Mean of Detected Data	0.0488	0.0162
Median of Detected Data	0.0065	0.0131
SD of Detected Data	0.0996	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-2.481
Critical z (0.95)	1.645
P-Value	0.993

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(mw-34-80)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	3	22
Number of Detect Data	10	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	23.08%	14.77%
Minimum Detected	0.0016	0.00102
Maximum Detected	0.238	0.0803
Mean of Detected Data	0.0282	0.0162
Median of Detected Data	0.00259	0.0131
SD of Detected Data	0.0739	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-2.66
Critical z (0.95)	1.645
P-Value	0.996

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(mw-37d)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	2	22
Number of Detect Data	11	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.003	0.0193
Percent Non detects	15.38%	14.77%
Minimum Detected	0.004	0.00102
Maximum Detected	0.326	0.0803
Mean of Detected Data	0.038	0.0162
Median of Detected Data	0.00614	0.0131
SD of Detected Data	0.0959	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.453
Critical z (0.95)	1.645
P-Value	0.927

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(ow-1d)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	149
Number of Non-Detect Data	1	22
Number of Detect Data	14	127
Minimum Non-Detect	0.003	0.001
Maximum Non-Detect	0.003	0.0193
Percent Non detects	6.67%	14.77%
Minimum Detected	0.00169	0.00102
Maximum Detected	0.122	0.0803
Mean of Detected Data	0.0236	0.0162
Median of Detected Data	0.0123	0.0131
SD of Detected Data	0.0336	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.089
Critical z (0.95)	1.645
P-Value	0.465

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(ow-1m)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	2	22
Number of Detect Data	12	127
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	14.29%	14.77%
Minimum Detected	0.00184	0.00102
Maximum Detected	0.0625	0.0803
Mean of Detected Data	0.0181	0.0162
Median of Detected Data	0.0128	0.0131
SD of Detected Data	0.0192	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.337
Critical z (0.95)	1.645
P-Value	0.632

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(ow-2d)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	4	22
Number of Detect Data	10	127
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	28.57%	14.77%
Minimum Detected	0.00148	0.00102
Maximum Detected	0.0862	0.0803
Mean of Detected Data	0.0233	0.0162
Median of Detected Data	0.0161	0.0131
SD of Detected Data	0.0261	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.594
Critical z (0.95)	1.645
P-Value	0.724

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(ow-2m)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	149
Number of Non-Detect Data	2	22
Number of Detect Data	11	127
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	15.38%	14.77%
Minimum Detected	0.0021	0.00102
Maximum Detected	0.0913	0.0803
Mean of Detected Data	0.0202	0.0162
Median of Detected Data	0.0114	0.0131
SD of Detected Data	0.0273	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.733
Critical z (0.95)	1.645
P-Value	0.768

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(ow-5d)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	3	22
Number of Detect Data	11	127
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	21.43%	14.77%
Minimum Detected	0.00166	0.00102
Maximum Detected	0.0966	0.0803
Mean of Detected Data	0.0249	0.0162
Median of Detected Data	0.013	0.0131
SD of Detected Data	0.033	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.659
Critical z (0.95)	1.645
P-Value	0.745

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(ow-5m)

Background Data: Vanadium, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	149
Number of Non-Detect Data	2	22
Number of Detect Data	12	127
Minimum Non-Detect	0.005	0.001
Maximum Non-Detect	0.005	0.0193
Percent Non detects	14.29%	14.77%
Minimum Detected	0.00181	0.00102
Maximum Detected	0.122	0.0803
Mean of Detected Data	0.0239	0.0162
Median of Detected Data	0.0111	0.0131
SD of Detected Data	0.036	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.516
Critical z (0.95)	1.645
P-Value	0.697

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-9)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	143
Number of Non-Detect Data	1	49
Number of Detect Data	26	94
Minimum Non-Detect	0.082	0.01
Maximum Non-Detect	0.082	0.0162
Percent Non detects	3.70%	34.27%
Minimum Detected	0.0034	0.0106
Maximum Detected	0.363	0.137
Mean of Detected Data	0.0802	0.0388
Median of Detected Data	0.0249	0.0281
SD of Detected Data	0.108	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.4
Critical z (0.95)	1.645
P-Value	0.00821

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-10)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	39	143
Number of Non-Detect Data	11	49
Number of Detect Data	28	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0289	0.0162
Percent Non detects	28.21%	34.27%
Minimum Detected	0.0053	0.0106
Maximum Detected	0.637	0.137
Mean of Detected Data	0.0782	0.0388
Median of Detected Data	0.024	0.0281
SD of Detected Data	0.142	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.166
Critical z (0.95)	1.645
P-Value	0.566

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-11)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	35	143
Number of Non-Detect Data	9	49
Number of Detect Data	26	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0214	0.0162
Percent Non detects	25.71%	34.27%
Minimum Detected	0.0053	0.0106
Maximum Detected	0.45	0.137
Mean of Detected Data	0.0743	0.0388
Median of Detected Data	0.021	0.0281
SD of Detected Data	0.129	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.274
Critical z (0.95)	1.645
P-Value	0.608

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-12)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	41	143
Number of Non-Detect Data	11	49
Number of Detect Data	30	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0261	0.0162
Percent Non detects	26.83%	34.27%
Minimum Detected	0.0046	0.0106
Maximum Detected	0.54	0.137
Mean of Detected Data	0.0522	0.0388
Median of Detected Data	0.0223	0.0281
SD of Detected Data	0.0969	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.149
Critical z (0.95)	1.645
P-Value	0.441

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-13)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	143
Number of Non-Detect Data	4	49
Number of Detect Data	23	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0758	0.0162
Percent Non detects	14.81%	34.27%
Minimum Detected	0.0068	0.0106
Maximum Detected	0.451	0.137
Mean of Detected Data	0.0911	0.0388
Median of Detected Data	0.0313	0.0281
SD of Detected Data	0.119	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.041
Critical z (0.95)	1.645
P-Value	0.0206

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-14)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	143
Number of Non-Detect Data	2	49
Number of Detect Data	24	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0676	0.0162
Percent Non detects	7.69%	34.27%
Minimum Detected	0.008	0.0106
Maximum Detected	0.498	0.137
Mean of Detected Data	0.085	0.0388
Median of Detected Data	0.0406	0.0281
SD of Detected Data	0.116	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.851
Critical z (0.95)	1.645
P-Value	0.00218

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-15)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	24	143
Number of Non-Detect Data	3	49
Number of Detect Data	21	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0356	0.0162
Percent Non detects	12.50%	34.27%
Minimum Detected	0.004	0.0106
Maximum Detected	0.419	0.137
Mean of Detected Data	0.0692	0.0388
Median of Detected Data	0.037	0.0281
SD of Detected Data	0.106	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.411
Critical z (0.95)	1.645
P-Value	0.0791

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-19)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	143
Number of Non-Detect Data	3	49
Number of Detect Data	19	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0315	0.0162
Percent Non detects	13.64%	34.27%
Minimum Detected	0.011	0.0106
Maximum Detected	0.398	0.137
Mean of Detected Data	0.0869	0.0388
Median of Detected Data	0.043	0.0281
SD of Detected Data	0.111	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.819
Critical z (0.95)	1.645
P-Value	0.00241

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-20-70)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	36	143
Number of Non-Detect Data	8	49
Number of Detect Data	28	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0611	0.0162
Percent Non detects	22.22%	34.27%
Minimum Detected	0.0112	0.0106
Maximum Detected	0.53	0.137
Mean of Detected Data	0.0912	0.0388
Median of Detected Data	0.027	0.0281
SD of Detected Data	0.129	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.305
Critical z (0.95)	1.645
P-Value	0.0106

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-20-100)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	143
Number of Non-Detect Data	2	49
Number of Detect Data	21	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0558	0.0162
Percent Non detects	8.70%	34.27%
Minimum Detected	0.0065	0.0106
Maximum Detected	0.486	0.137
Mean of Detected Data	0.0996	0.0388
Median of Detected Data	0.054	0.0281
SD of Detected Data	0.112	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.037
Critical z (0.95)	1.645
P-Value	2.71E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-20-130)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	34	143
Number of Non-Detect Data	7	49
Number of Detect Data	27	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.1	0.0162
Percent Non detects	20.59%	34.27%
Minimum Detected	0.0102	0.0106
Maximum Detected	0.445	0.137
Mean of Detected Data	0.097	0.0388
Median of Detected Data	0.053	0.0281
SD of Detected Data	0.0974	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.569
Critical z (0.95)	1.645
P-Value	0.0001792

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-21)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	143
Number of Non-Detect Data	5	49
Number of Detect Data	20	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.097	0.0162
Percent Non detects	20.00%	34.27%
Minimum Detected	0.0053	0.0106
Maximum Detected	0.692	0.137
Mean of Detected Data	0.181	0.0388
Median of Detected Data	0.0818	0.0281
SD of Detected Data	0.215	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.444
Critical z (0.95)	1.645
P-Value	0.00725

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-22)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	27	143
Number of Non-Detect Data	5	49
Number of Detect Data	22	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0487	0.0162
Percent Non detects	18.52%	34.27%
Minimum Detected	0.0068	0.0106
Maximum Detected	0.734	0.137
Mean of Detected Data	0.0911	0.0388
Median of Detected Data	0.0473	0.0281
SD of Detected Data	0.154	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.001
Critical z (0.95)	1.645
P-Value	0.0227

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-23)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	26	143
Number of Non-Detect Data	4	49
Number of Detect Data	22	94
Minimum Non-Detect	0.02	0.01
Maximum Non-Detect	0.0405	0.0162
Percent Non detects	15.38%	34.27%
Minimum Detected	0.0066	0.0106
Maximum Detected	0.817	0.137
Mean of Detected Data	0.123	0.0388
Median of Detected Data	0.0464	0.0281
SD of Detected Data	0.198	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.96
Critical z (0.95)	1.645
P-Value	0.025

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-24a)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	143
Number of Non-Detect Data	4	49
Number of Detect Data	21	94
Minimum Non-Detect	0.02	0.01
Maximum Non-Detect	0.0541	0.0162
Percent Non detects	16.00%	34.27%
Minimum Detected	0.0056	0.0106
Maximum Detected	0.62	0.137
Mean of Detected Data	0.104	0.0388
Median of Detected Data	0.0412	0.0281
SD of Detected Data	0.149	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.028
Critical z (0.95)	1.645
P-Value	0.00123

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-24b)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	143
Number of Non-Detect Data	3	49
Number of Detect Data	20	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0805	0.0162
Percent Non detects	13.04%	34.27%
Minimum Detected	0.0096	0.0106
Maximum Detected	0.468	0.137
Mean of Detected Data	0.0868	0.0388
Median of Detected Data	0.03	0.0281
SD of Detected Data	0.124	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.515
Critical z (0.95)	1.645
P-Value	0.00596

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-24br)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	143
Number of Non-Detect Data	3	49
Number of Detect Data	19	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0739	0.0162
Percent Non detects	13.64%	34.27%
Minimum Detected	0.009	0.0106
Maximum Detected	0.152	0.137
Mean of Detected Data	0.068	0.0388
Median of Detected Data	0.055	0.0281
SD of Detected Data	0.0516	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.858
Critical z (0.95)	1.645
P-Value	0.00213

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-25)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	29	143
Number of Non-Detect Data	6	49
Number of Detect Data	23	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.02	0.0162
Percent Non detects	20.69%	34.27%
Minimum Detected	0.0073	0.0106
Maximum Detected	0.555	0.137
Mean of Detected Data	0.0887	0.0388
Median of Detected Data	0.04	0.0281
SD of Detected Data	0.125	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.094
Critical z (0.95)	1.645
P-Value	0.0181

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-26)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	25	143
Number of Non-Detect Data	2	49
Number of Detect Data	23	94
Minimum Non-Detect	0.02	0.01
Maximum Non-Detect	0.0665	0.0162
Percent Non detects	8.00%	34.27%
Minimum Detected	0.0088	0.0106
Maximum Detected	0.514	0.137
Mean of Detected Data	0.105	0.0388
Median of Detected Data	0.049	0.0281
SD of Detected Data	0.131	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.972
Critical z (0.95)	1.645
P-Value	3.558E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-27-20)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	143
Number of Non-Detect Data	4	49
Number of Detect Data	18	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.194	0.0162
Percent Non detects	18.18%	34.27%
Minimum Detected	0.0053	0.0106
Maximum Detected	0.44	0.137
Mean of Detected Data	0.0875	0.0388
Median of Detected Data	0.0299	0.0281
SD of Detected Data	0.119	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.471
Critical z (0.95)	1.645
P-Value	0.0706

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-28-25)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	21	143
Number of Non-Detect Data	2	49
Number of Detect Data	19	94
Minimum Non-Detect	0.0482	0.01
Maximum Non-Detect	0.168	0.0162
Percent Non detects	9.52%	34.27%
Minimum Detected	0.0053	0.0106
Maximum Detected	0.286	0.137
Mean of Detected Data	0.0613	0.0388
Median of Detected Data	0.053	0.0281
SD of Detected Data	0.0706	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.45
Critical z (0.95)	1.645
P-Value	0.0736

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-29)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	143
Number of Non-Detect Data	1	49
Number of Detect Data	21	94
Minimum Non-Detect	0.0703	0.01
Maximum Non-Detect	0.0703	0.0162
Percent Non detects	4.55%	34.27%
Minimum Detected	0.0049	0.0106
Maximum Detected	0.356	0.137
Mean of Detected Data	0.077	0.0388
Median of Detected Data	0.046	0.0281
SD of Detected Data	0.102	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.353
Critical z (0.95)	1.645
P-Value	0.00932

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-30-30)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	22	143
Number of Non-Detect Data	4	49
Number of Detect Data	18	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.0428	0.0162
Percent Non detects	18.18%	34.27%
Minimum Detected	0.008	0.0106
Maximum Detected	0.597	0.137
Mean of Detected Data	0.0749	0.0388
Median of Detected Data	0.0365	0.0281
SD of Detected Data	0.135	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.476
Critical z (0.95)	1.645
P-Value	0.07

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-31-60)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	23	143
Number of Non-Detect Data	2	49
Number of Detect Data	21	94
Minimum Non-Detect	0.02	0.01
Maximum Non-Detect	0.0635	0.0162
Percent Non detects	8.70%	34.27%
Minimum Detected	0.0073	0.0106
Maximum Detected	0.274	0.137
Mean of Detected Data	0.0807	0.0388
Median of Detected Data	0.036	0.0281
SD of Detected Data	0.0848	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.09
Critical z (0.95)	1.645
P-Value	0.001

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

1				Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects								
2		User Selected Options										
3		From File		I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files								
4		Full Precision		OFF								
5		Confidence Coefficient		95%								
6		Substantial Difference		0								
7		Selected Null Hypothesis		Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)								
8		Alternative Hypothesis		Site or AOC Mean/Median Greater Than Background Mean/Median								
9												
10												
11	Area of Concern Data: Zinc, dissolved(mw-31-135)											
12	Background Data: Zinc, dissolved(1)											
13												
14			Raw Statistics									
15				Site	Background							
16			Number of Valid Data	1	143							
17			Number of Non-Detect Data	1	49							
18			Number of Detect Data	0	94							
19			Minimum Non-Detect	0.01	0.01							
20			Maximum Non-Detect	0.01	0.0162							
21			Percent Non detects	100.00%	34.27%							
22			Minimum Detected	N/A	0.0106							
23			Maximum Detected	N/A	0.137							
24			Mean of Detected Data	N/A	0.0388							
25			Median of Detected Data	N/A	0.0281							
26			SD of Detected Data	N/A	0.0283							
27												
28			Site vs Background Gehan Test									
29												
30	H0: Mean/Median of Site or AOC <= Mean/Median of background											
31												
32			Gehan z Test Value	-1.157								
33			Critical z (0.95)	1.645								
34			P-Value	0.876								
35												
36	Conclusion with Alpha = 0.05											
37	Do Not Reject H0, Conclude Site <= Background											
38	P-Value >= alpha (0.05)											
39												

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-32-35)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	9	143
Number of Non-Detect Data	4	49
Number of Detect Data	5	94
Minimum Non-Detect	0.02	0.01
Maximum Non-Detect	0.2	0.0162
Percent Non detects	44.44%	34.27%
Minimum Detected	0.0398	0.0106
Maximum Detected	0.381	0.137
Mean of Detected Data	0.223	0.0388
Median of Detected Data	0.297	0.0281
SD of Detected Data	0.157	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.808
Critical z (0.95)	1.645
P-Value	0.0353

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-34-55)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	143
Number of Non-Detect Data	5	49
Number of Detect Data	9	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0831	0.0162
Percent Non detects	35.71%	34.27%
Minimum Detected	0.0141	0.0106
Maximum Detected	0.163	0.137
Mean of Detected Data	0.0536	0.0388
Median of Detected Data	0.0349	0.0281
SD of Detected Data	0.048	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.791
Critical z (0.95)	1.645
P-Value	0.214

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-34-80)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	18	143
Number of Non-Detect Data	9	49
Number of Detect Data	9	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.0755	0.0162
Percent Non detects	50.00%	34.27%
Minimum Detected	0.0232	0.0106
Maximum Detected	0.0854	0.137
Mean of Detected Data	0.0479	0.0388
Median of Detected Data	0.037	0.0281
SD of Detected Data	0.0234	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.0472
Critical z (0.95)	1.645
P-Value	0.481

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(mw-37d)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	13	143
Number of Non-Detect Data	8	49
Number of Detect Data	5	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.02	0.0162
Percent Non detects	61.54%	34.27%
Minimum Detected	0.011	0.0106
Maximum Detected	0.0918	0.137
Mean of Detected Data	0.0386	0.0388
Median of Detected Data	0.0266	0.0281
SD of Detected Data	0.0313	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.456
Critical z (0.95)	1.645
P-Value	0.927

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(ow-5m)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	14	143
Number of Non-Detect Data	9	49
Number of Detect Data	5	94
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.02	0.0162
Percent Non detects	64.29%	34.27%
Minimum Detected	0.0238	0.0106
Maximum Detected	0.278	0.137
Mean of Detected Data	0.0781	0.0388
Median of Detected Data	0.0264	0.0281
SD of Detected Data	0.112	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.124
Critical z (0.95)	1.645
P-Value	0.869

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(pge-6)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	143
Number of Non-Detect Data	1	49
Number of Detect Data	16	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.005	0.0162
Percent Non detects	5.88%	34.27%
Minimum Detected	0.0067	0.0106
Maximum Detected	1.5	0.137
Mean of Detected Data	0.142	0.0388
Median of Detected Data	0.037	0.0281
SD of Detected Data	0.365	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.121
Critical z (0.95)	1.645
P-Value	0.017

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(pge-7)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	15	143
Number of Non-Detect Data	0	49
Number of Detect Data	15	94
Minimum Non-Detect	N/A	0.01
Maximum Non-Detect	N/A	0.0162
Percent Non detects	0.00%	34.27%
Minimum Detected	0.01	0.0106
Maximum Detected	0.125	0.137
Mean of Detected Data	0.0379	0.0388
Median of Detected Data	0.029	0.0281
SD of Detected Data	0.0297	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.249
Critical z (0.95)	1.645
P-Value	0.0123

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Single Chemical Input Files	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(pge-8)

Background Data: Zinc, dissolved(1)

Raw Statistics

	Site	Background
Number of Valid Data	17	143
Number of Non-Detect Data	0	49
Number of Detect Data	17	94
Minimum Non-Detect	N/A	0.01
Maximum Non-Detect	N/A	0.0162
Percent Non detects	0.00%	34.27%
Minimum Detected	0.015	0.0106
Maximum Detected	0.82	0.137
Mean of Detected Data	0.177	0.0388
Median of Detected Data	0.08	0.0281
SD of Detected Data	0.24	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.381
Critical z (0.95)	1.645
P-Value	5.903E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

ARCADIS

Site-Wide

ProUCL Outputs - Floodplain

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Aluminum, dissolved (background)											
10												
11	General Statistics											
12	Number of Valid Data			149		Number of Detected Data					27	
13	Number of Distinct Detected Data			27		Number of Non-Detect Data					122	
14						Percent Non-Detects					81.88%	
15												
16	Raw Statistics					Log-transformed Statistics						
17	Minimum Detected			0.0509		Minimum Detected					-2.978	
18	Maximum Detected			0.164		Maximum Detected					-1.808	
19	Mean of Detected			0.0784		Mean of Detected					-2.614	
20	SD of Detected			0.0327		SD of Detected					0.358	
21	Minimum Non-Detect			0.05		Minimum Non-Detect					-2.996	
22	Maximum Non-Detect			0.101		Maximum Non-Detect					-2.293	
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect					143	
25	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected					6	
26	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage					95.97%	
27												
28	UCL Statistics											
29	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
30	Lilliefors Test Statistic			0.769		Lilliefors Test Statistic					0.827	
31	5% Lilliefors Critical Value			0.923		5% Lilliefors Critical Value					0.923	
32	Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level						
33												
34	Assuming Normal Distribution					Assuming Lognormal Distribution						
35	DL/2 Substitution Method					DL/2 Substitution Method						
36	Mean			0.035		Mean					-3.483	
37	SD			0.0248		SD					0.444	
38	95% DL/2 (t) UCL			0.0384		95% H-Stat (DL/2) UCL					0.0342	
39												
40	Maximum Likelihood Estimate(MLE) Method			N/A		Log ROS Method						
41	MLE yields a negative mean					Mean in Log Scale					-3.779	
42						SD in Log Scale					0.792	
43						Mean in Original Scale					0.0312	
44						SD in Original Scale					0.028	
45						95% Percentile Bootstrap UCL					0.0351	
46						95% BCA Bootstrap UCL					0.0355	
47												
48	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
49	k star (bias corrected)			6.674		Data do not follow a Discernable Distribution (0.05)						
50	Theta Star			0.0117								
51	nu star			360.4								
52												
53	A-D Test Statistic			2.14		Nonparametric Statistics						

54				5% A-D Critical Value	0.746				Kaplan-Meier (KM) Method			
55				K-S Test Statistic	0.746				Mean			0.0559
56				5% K-S Critical Value	0.168				SD			0.0173
57				**Data not Gamma Distributed at 5% Significance Level**					SE of Mean			0.00144
58									95% KM (t) UCL			0.0583
59				**Assuming Gamma Distribution**					95% KM (z) UCL			0.0583
60				Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL			0.058
61				Minimum	0.0181				95% KM (bootstrap t) UCL			0.0587
62				Maximum	0.173				95% KM (BCA) UCL			0.0605
63				Mean	0.122				95% KM (Percentile Bootstrap) UCL			0.0594
64				Median	0.133				95% KM (Chebyshev) UCL			0.0622
65				SD	0.0396				97.5% KM (Chebyshev) UCL			0.0649
66				k star	7.048				99% KM (Chebyshev) UCL			0.0703
67				Theta star	0.0173							
68				Nu star	2100				**Potential UCLs to Use**			
69				AppChi2	1995				95% KM (t) UCL			0.0583
70				95% Gamma Approximate UCL	0.128				95% KM (% Bootstrap) UCL			0.0594
71				95% Adjusted Gamma UCL	0.128							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Aluminum, dissolved (flood)**											
76												
77					**General Statistics**							
78				Number of Valid Data	46				Number of Detected Data			2
79				Number of Distinct Detected Data	2				Number of Non-Detect Data			44
80									Percent Non-Detects			95.65%
81												
82				**Raw Statistics**					**Log-transformed Statistics**			
83				Minimum Detected	0.0605				Minimum Detected			-2.805
84				Maximum Detected	0.141				Maximum Detected			-1.959
85				Mean of Detected	0.101				Mean of Detected			-2.382
86				SD of Detected	0.0569				SD of Detected			0.598
87				Minimum Non-Detect	0.05				Minimum Non-Detect			-2.996
88				Maximum Non-Detect	0.5				Maximum Non-Detect			-0.693
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			46
91	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			0
92	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
93												
94	**Warning: Data set has only 2 Distinct Detected Values.**											
95	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
96	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
97												
98	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
99												
100	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
101	**Those methods will return a 'N/A' value on your output display!**											
102												
103	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
104	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
105												
106												

	A	B	C	D	E	F	G	H	I	J	K	L
107	**UCL Statistics**											
108	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
109					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
110					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
111	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
112												
113	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
114					DL/2 Substitution Method						DL/2 Substitution Method	
115					Mean	0.0482					Mean	-3.418
116					SD	0.0654					SD	0.693
117					95% DL/2 (t) UCL	0.0644					95% H-Stat (DL/2) UCL	0.0527
118												
119					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
120	**MLE method failed to converge properly**										Mean in Log Scale	N/A
121											SD in Log Scale	N/A
122											Mean in Original Scale	N/A
123											SD in Original Scale	N/A
124											95% Percentile Bootstrap UCL	N/A
125											95% BCA Bootstrap UCL	N/A
126												
127	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
128					k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**					
129					Theta Star	N/A						
130					nu star	N/A						
131												
132					A-D Test Statistic	0.359	**Nonparametric Statistics**					
133					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
134					K-S Test Statistic	N/A					Mean	0.0624
135					5% K-S Critical Value	N/A					SD	0.0123
136	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00268
137											95% KM (t) UCL	0.0669
138	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0668
139					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.115
140					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
141					Maximum	N/A					95% KM (BCA) UCL	N/A
142					Mean	N/A					95% KM (Percentile Bootstrap) UCL	N/A
143					Median	N/A					95% KM (Chebyshev) UCL	0.0741
144					SD	N/A					97.5% KM (Chebyshev) UCL	0.0791
145					k star	N/A					99% KM (Chebyshev) UCL	0.0891
146					Theta star	N/A						
147					Nu star	N/A	**Potential UCLs to Use**					
148					AppChi2	N/A					95% KM (t) UCL	0.0669
149					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	N/A
150					95% Adjusted Gamma UCL	N/A						
151	**Note: DL/2 is not a recommended method.**											
152												
153												
154	**Aluminum, dissolved (no flood)**											
155												
156	**General Statistics**											
157					Number of Valid Data	248					Number of Detected Data	19
158					Number of Distinct Detected Data	17					Number of Non-Detect Data	229
159											Percent Non-Detects	92.34%

160												
161	**Raw Statistics**						**Log-transformed Statistics**					
162					Minimum Detected	0.0535					Minimum Detected	-2.928
163					Maximum Detected	0.749					Maximum Detected	-0.289
164					Mean of Detected	0.125					Mean of Detected	-2.379
165					SD of Detected	0.157					SD of Detected	0.643
166					Minimum Non-Detect	0.05					Minimum Non-Detect	-2.996
167					Maximum Non-Detect	0.52					Maximum Non-Detect	-0.654
168												
169	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	247
170	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	1
171	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	99.60%
172												
173	**UCL Statistics**											
174	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
175					Lilliefors Test Statistic	0.449					Lilliefors Test Statistic	0.762
176					5% Lilliefors Critical Value	0.901					5% Lilliefors Critical Value	0.901
177	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
178												
179	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
180					DL/2 Substitution Method						DL/2 Substitution Method	
181					Mean	0.0387					Mean	-3.508
182					SD	0.0601					SD	0.51
183					95% DL/2 (t) UCL	0.045					95% H-Stat (DL/2) UCL	0.036
184												
185					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
186	**MLE method failed to converge properly**										Mean in Log Scale	-5.504
187											SD in Log Scale	1.643
188											Mean in Original Scale	0.016
189											SD in Original Scale	0.0533
190											95% Percentile Bootstrap UCL	0.0222
191											95% BCA Bootstrap UCL	0.0256
192												
193	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
194					k star (bias corrected)	1.583	**Data do not follow a Discernable Distribution (0.05)**					
195					Theta Star	0.0787						
196					nu star	60.17						
197												
198					A-D Test Statistic	2.186	**Nonparametric Statistics**					
199					5% A-D Critical Value	0.753					Kaplan-Meier (KM) Method	
200					K-S Test Statistic	0.753					Mean	0.059
201					5% K-S Critical Value	0.201					SD	0.0463
202	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00302
203											95% KM (t) UCL	0.064
204	**Assuming Gamma Distribution**										95% KM (z) UCL	0.064
205					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0629
206					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0732
207					Maximum	0.749					95% KM (BCA) UCL	0.0687
208					Mean	0.352					95% KM (Percentile Bootstrap) UCL	0.066
209					Median	0.372					95% KM (Chebyshev) UCL	0.0722
210					SD	0.196					97.5% KM (Chebyshev) UCL	0.0779
211					k star	0.785					99% KM (Chebyshev) UCL	0.0891
212					Theta star	0.448						

	A	B	C	D	E	F	G	H	I	J	K	L
213					Nu star	389.5	**Potential UCLs to Use**					
214					AppChi2	344.8					95% KM (t) UCL	0.064
215					95% Gamma Approximate UCL	0.398					95% KM (% Bootstrap) UCL	0.066
216					95% Adjusted Gamma UCL	0.398						
217	**Note: DL/2 is not a recommended method.**											
218												

General UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Ammonia as nitrogen (background)

General Statistics

Number of Valid Data	149	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	141
		Percent Non-Detects	94.63%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.586	Minimum Detected	-0.534
Maximum Detected	1.06	Maximum Detected	0.0583
Mean of Detected	0.751	Mean of Detected	-0.308
SD of Detected	0.178	SD of Detected	0.22
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.815	Lilliefors Test Statistic	0.854
5% Lilliefors Critical Value	0.818	5% Lilliefors Critical Value	0.818
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.277	Mean	-1.328
SD	0.12	SD	0.248
95% DL/2 (t) UCL	0.293	95% H-Stat (DL/2) UCL	0.276
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-1.787
		SD in Log Scale	0.728
		Mean in Original Scale	0.218
		SD in Original Scale	0.174
		95% Percentile Bootstrap UCL	0.242
		95% BCA Bootstrap UCL	0.246
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	14.21	**Data appear Gamma Distributed at 5% Significance Level**	

54					Theta Star	0.0529						
55					nu star	227.3						
56												
57					A-D Test Statistic	0.664	**Nonparametric Statistics**					
58					5% A-D Critical Value	0.716	Kaplan-Meier (KM) Method					
59					K-S Test Statistic	0.716	Mean	0.595				
60					5% K-S Critical Value	0.294	SD	0.0537				
61	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.0047				
62							95% KM (t) UCL	0.603				
63	**Assuming Gamma Distribution**						95% KM (z) UCL	0.603				
64					Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.615				
65					Minimum	0.489	95% KM (bootstrap t) UCL	0.61				
66					Maximum	1.765	95% KM (BCA) UCL	0.678				
67					Mean	1.411	95% KM (Percentile Bootstrap) UCL	0.668				
68					Median	1.502	95% KM (Chebyshev) UCL	0.615				
69					SD	0.309	97.5% KM (Chebyshev) UCL	0.624				
70					k star	16.02	99% KM (Chebyshev) UCL	0.642				
71					Theta star	0.0881						
72					Nu star	4775	**Potential UCLs to Use**					
73					AppChi2	4615	95% KM (t) UCL	0.603				
74					95% Gamma Approximate UCL	1.46						
75					95% Adjusted Gamma UCL	1.461						
76	**Note: DL/2 is not a recommended method.**											
77												
78												
79	**Ammonia as nitrogen (flood)**											
80												
81						**General Statistics**							
82					Number of Valid Data	226	Number of Detected Data	78				
83					Number of Distinct Detected Data	62	Number of Non-Detect Data	148				
84							Percent Non-Detects	65.49%				
85												
86	**Raw Statistics**						**Log-transformed Statistics**					
87					Minimum Detected	0.062	Minimum Detected	-2.781				
88					Maximum Detected	13.6	Maximum Detected	2.61				
89					Mean of Detected	2.742	Mean of Detected	0.425				
90					SD of Detected	3.335	SD of Detected	1.095				
91					Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303				
92					Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693				
93												
94	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	156				
95	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	70				
96	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	69.03%				
97												
98						**UCL Statistics**							
99	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
100					Lilliefors Test Statistic	0.265	Lilliefors Test Statistic	0.0736				
101					5% Lilliefors Critical Value	0.1	5% Lilliefors Critical Value	0.1				
102	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
103												
104	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
105					DL/2 Substitution Method		DL/2 Substitution Method					
106					Mean	1.088	Mean	-0.926				

107					SD	2.293					SD	1.255
108					95% DL/2 (t) UCL	1.34					95% H-Stat (DL/2) UCL	0.759
109												
110					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
111					**MLE yields a negative mean**						Mean in Log Scale	-1.571
112											SD in Log Scale	1.894
113											Mean in Original Scale	1.034
114											SD in Original Scale	2.316
115											95% Percentile Bootstrap UCL	1.272
116											95% BCA Bootstrap UCL	1.362
117												
118					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
119					k star (bias corrected)	0.961					**Data appear Lognormal at 5% Significance Level**	
120					Theta Star	2.853						
121					nu star	149.9						
122												
123					A-D Test Statistic	2.479					**Nonparametric Statistics**	
124					5% A-D Critical Value	0.782					Kaplan-Meier (KM) Method	
125					K-S Test Statistic	0.782					Mean	1.013
126					5% K-S Critical Value	0.104					SD	2.318
127					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.156
128											95% KM (t) UCL	1.27
129					**Assuming Gamma Distribution**						95% KM (z) UCL	1.269
130					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.226
131					Minimum	0.062					95% KM (bootstrap t) UCL	1.287
132					Maximum	13.6					95% KM (BCA) UCL	1.385
133					Mean	2.608					95% KM (Percentile Bootstrap) UCL	1.318
134					Median	2.416					95% KM (Chebyshev) UCL	1.691
135					SD	1.975					97.5% KM (Chebyshev) UCL	1.985
136					k star	2.517					99% KM (Chebyshev) UCL	2.561
137					Theta star	1.036						
138					Nu star	1138					**Potential UCLs to Use**	
139					AppChi2	1060					95% KM (BCA) UCL	1.385
140					95% Gamma Approximate UCL	2.798						
141					95% Adjusted Gamma UCL	2.799						
142	**Note: DL/2 is not a recommended method.**											
143												
144												
145	**Ammonia as nitrogen (no flood)**											
146												
147							**General Statistics**					
148					Number of Valid Data	343					Number of Detected Data	42
149					Number of Distinct Detected Data	26					Number of Non-Detect Data	301
150											Percent Non-Detects	87.76%
151												
152					**Raw Statistics**						**Log-transformed Statistics**	
153					Minimum Detected	0.07					Minimum Detected	-2.659
154					Maximum Detected	180					Maximum Detected	5.193
155					Mean of Detected	5.262					Mean of Detected	-0.834
156					SD of Detected	27.67					SD of Detected	1.621
157					Minimum Non-Detect	0.02					Minimum Non-Detect	-3.912
158					Maximum Non-Detect	1					Maximum Non-Detect	0
159												

160	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	332
161	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	11
162	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	96.79%
163												
164	**UCL Statistics**											
165	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
166					Lilliefors Test Statistic	0.189					Lilliefors Test Statistic	0.822
167					5% Lilliefors Critical Value	0.942					5% Lilliefors Critical Value	0.942
168	**Data not Normal at 5% Significance Level**										**Data not Lognormal at 5% Significance Level**	
169												
170	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
171					DL/2 Substitution Method						DL/2 Substitution Method	
172					Mean	0.849					Mean	-1.448
173					SD	9.721					SD	0.761
174					95% DL/2 (t) UCL	1.714					95% H-Stat (DL/2) UCL	0.345
175												
176					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
177	**MLE yields a negative mean**										Mean in Log Scale	-2.583
178											SD in Log Scale	1.618
179											Mean in Original Scale	0.775
180											SD in Original Scale	9.728
181											95% Percentile Bootstrap UCL	1.823
182											95% BCA Bootstrap UCL	2.391
183												
184	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
185					k star (bias corrected)	0.276					**Data do not follow a Discernable Distribution (0.05)**	
186					Theta Star	19.09						
187					nu star	23.15						
188												
189					A-D Test Statistic	7.05					**Nonparametric Statistics**	
190					5% A-D Critical Value	0.868					Kaplan-Meier (KM) Method	
191					K-S Test Statistic	0.868					Mean	0.764
192					5% K-S Critical Value	0.149					SD	9.713
193	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.531
194											95% KM (t) UCL	1.639
195	**Assuming Gamma Distribution**										95% KM (z) UCL	1.637
196					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.628
197					Minimum	0.07					95% KM (bootstrap t) UCL	11.77
198					Maximum	180					95% KM (BCA) UCL	1.822
199					Mean	16.27					95% KM (Percentile Bootstrap) UCL	1.811
200					Median	4.2					95% KM (Chebyshev) UCL	3.078
201					SD	24.17					97.5% KM (Chebyshev) UCL	4.079
202					k star	0.457					99% KM (Chebyshev) UCL	6.046
203					Theta star	35.57						
204					Nu star	313.7					**Potential UCLs to Use**	
205					AppChi2	273.7					95% KM (Chebyshev) UCL	3.078
206					95% Gamma Approximate UCL	18.65						
207					95% Adjusted Gamma UCL	18.66						
208	**Note: DL/2 is not a recommended method.**											
209												

General UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Antimony, dissolved (background)

General Statistics

Number of Valid Data	149	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	148
		Percent Non-Detects	99.33%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Antimony, dissolved (background) was not processed!

Antimony, dissolved (flood)

General Statistics

Number of Valid Data	79	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	74
		Percent Non-Detects	93.67%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0088	Minimum Detected	-4.733
Maximum Detected	0.155	Maximum Detected	-1.864
Mean of Detected	0.0772	Mean of Detected	-3.054
SD of Detected	0.0712	SD of Detected	1.223
Minimum Non-Detect	0.002	Minimum Non-Detect	-6.215
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	75
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	94.94%

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.806	Lilliefors Test Statistic	0.911
5% Lilliefors Critical Value	0.762	5% Lilliefors Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

54												
55	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
56	DL/2 Substitution Method						DL/2 Substitution Method					
57	Mean				0.00641		Mean					-6.323
58	SD				0.0246		SD					0.998
59	95% DL/2 (t) UCL				0.011		95% H-Stat (DL/2) UCL					0.00345
60												
61	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
62	**MLE yields a negative mean**						Mean in Log Scale					-10.69
63							SD in Log Scale					3.69
64							Mean in Original Scale					0.00518
65							SD in Original Scale					0.0248
66							95% Percentile Bootstrap UCL					0.0102
67							95% BCA Bootstrap UCL					0.0127
68												
69	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
70	k star (bias corrected)				0.595		**Data appear Normal at 5% Significance Level**					
71	Theta Star				0.13							
72	nu star				5.948							
73												
74	A-D Test Statistic				0.386		**Nonparametric Statistics**					
75	5% A-D Critical Value				0.69		Kaplan-Meier (KM) Method					
76	K-S Test Statistic				0.69		Mean					0.0131
77	5% K-S Critical Value				0.364		SD					0.0231
78	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.00291
79							95% KM (t) UCL					0.018
80	**Assuming Gamma Distribution**						95% KM (z) UCL					0.0179
81	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.0243
82	Minimum				0.00341		95% KM (bootstrap t) UCL					0.023
83	Maximum				5.176		95% KM (BCA) UCL					0.153
84	Mean				1.858		95% KM (Percentile Bootstrap) UCL					0.0487
85	Median				1.535		95% KM (Chebyshev) UCL					0.0258
86	SD				1.573		97.5% KM (Chebyshev) UCL					0.0313
87	k star				0.788		99% KM (Chebyshev) UCL					0.042
88	Theta star				2.359							
89	Nu star				124.5		**Potential UCLs to Use**					
90	AppChi2				99.69		95% KM (t) UCL					0.018
91	95% Gamma Approximate UCL				2.32		95% KM (Percentile Bootstrap) UCL					0.0487
92	95% Adjusted Gamma UCL				2.33							
93	**Note: DL/2 is not a recommended method.**											
94												
95												
96	**Antimony, dissolved (no flood)**											
97												
98	**General Statistics**											
99	Number of Valid Data				305		Number of Detected Data					4
100	Number of Distinct Detected Data				4		Number of Non-Detect Data					301
101							Percent Non-Detects					98.69%
102												
103	**Raw Statistics**						**Log-transformed Statistics**					
104	Minimum Detected				0.0033		Minimum Detected					-5.714
105	Maximum Detected				0.0209		Maximum Detected					-3.868
106	Mean of Detected				0.0121		Mean of Detected					-4.606

107					SD of Detected	0.00723					SD of Detected	0.786
108					Minimum Non-Detect	0.002					Minimum Non-Detect	-6.215
109					Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298
110												
111	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	302
112	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	3
113	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	99.02%
114												
115	**Warning: There are only 4 Distinct Detected Values in this data**											
116	**Note: It should be noted that even though bootstrap may be performed on this data set**											
117	**the resulting calculations may not be reliable enough tp draw conclusions**											
118												
119	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
120												
121												
122	**UCL Statistics**											
123	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
124					Lilliefors Test Statistic	0.983					Lilliefors Test Statistic	0.905
125					5% Lilliefors Critical Value	0.748					5% Lilliefors Critical Value	0.748
126	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
127												
128	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
129					DL/2 Substitution Method						DL/2 Substitution Method	
130					Mean	0.00172					Mean	-6.488
131					SD	0.00151					SD	0.416
132					95% DL/2 (t) UCL	0.00186					95% H-Stat (DL/2) UCL	0.0017
133												
134					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
135	**MLE yields a negative mean**										Mean in Log Scale	-12.45
136											SD in Log Scale	3.007
137											Mean in Original Scale	0.0002335
138											SD in Original Scale	0.00156
139											95% Percentile Bootstrap UCL	0.000401
140											95% BCA Bootstrap UCL	0.0004591
141												
142	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
143					k star (bias corrected)	0.864	**Data appear Normal at 5% Significance Level**					
144					Theta Star	0.014						
145					nu star	6.914						
146												
147					A-D Test Statistic	0.307	**Nonparametric Statistics**					
148					5% A-D Critical Value	0.66					Kaplan-Meier (KM) Method	
149					K-S Test Statistic	0.66					Mean	0.00342
150					5% K-S Critical Value	0.397					SD	0.00123
151	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	8.126E-05
152											95% KM (t) UCL	0.00355
153	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00355
154					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00842
155					Minimum	0.0033					95% KM (bootstrap t) UCL	0.00351
156					Maximum	0.881					95% KM (BCA) UCL	0.0209
157					Mean	0.407					95% KM (Percentile Bootstrap) UCL	0.0131
158					Median	0.394					95% KM (Chebyshev) UCL	0.00377
159					SD	0.262					97.5% KM (Chebyshev) UCL	0.00392

	A	B	C	D	E	F	G	H	I	J	K	L
160					k star	1.416				99% KM (Chebyshev) UCL		0.00422
161					Theta star	0.288						
162					Nu star	863.6	**Potential UCLs to Use**					
163					AppChi2	796.4				95% KM (t) UCL		0.00355
164				95% Gamma Approximate UCL		0.441				95% KM (Percentile Bootstrap) UCL		0.0131
165				95% Adjusted Gamma UCL		N/A						
166	**Note: DL/2 is not a recommended method.**											
167												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Arsenic, dissolved (background)

General Statistics

Number of Valid Data	132	Number of Detected Data	129
Number of Distinct Detected Data	118	Number of Non-Detect Data	3
		Percent Non-Detects	2.27%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.00107	Minimum Detected	-6.84
Maximum Detected	0.0191	Maximum Detected	-3.958
Mean of Detected	0.00598	Mean of Detected	-5.31
SD of Detected	0.00389	SD of Detected	0.634
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.161	Lilliefors Test Statistic	0.105
5% Lilliefors Critical Value	0.078	5% Lilliefors Critical Value	0.078
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00585	Mean	-5.362
SD	0.00393	SD	0.715
95% DL/2 (t) UCL	0.00642	95% H-Stat (DL/2) UCL	0.0066
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00582	Mean in Log Scale	-5.346
SD	0.00397	SD in Log Scale	0.671
95% MLE (t) UCL	0.00639	Mean in Original Scale	0.00586
95% MLE (Tiku) UCL	0.00637	SD in Original Scale	0.00391
		95% Percentile Bootstrap UCL	0.0064
		95% BCA Bootstrap UCL	0.00647

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	2.728	**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
Theta Star	0.00219		
nu star	703.8		
A-D Test Statistic	1.568	**Nonparametric Statistics**	
5% A-D Critical Value	0.76	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.76	Mean	0.00586
5% K-S Critical Value	0.0826	SD	0.0039

54	**Data follow Appr. Gamma Distribution at 5% Significance Level**										SE of Mean	0.0003405
55											95% KM (t) UCL	0.00643
56	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00642
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00643
58	Minimum	1E-09									95% KM (bootstrap t) UCL	0.00649
59	Maximum	0.0191									95% KM (BCA) UCL	0.00644
60	Mean	0.00584									95% KM (Percentile Bootstrap) UCL	0.00641
61	Median	0.00538									95% KM (Chebyshev) UCL	0.00735
62	SD	0.00394									97.5% KM (Chebyshev) UCL	0.00799
63	k star	1.083									99% KM (Chebyshev) UCL	0.00925
64	Theta star	0.00539										
65	Nu star	286									**Potential UCLs to Use**	
66	AppChi2	247.8									95% KM (BCA) UCL	0.00644
67	95% Gamma Approximate UCL	0.00674										
68	95% Adjusted Gamma UCL	0.00675										
69	**Note: DL/2 is not a recommended method.**											
70												
71												
72	**Arsenic, dissolved (flood)**											
73												
74	**General Statistics**											
75	Number of Valid Data	134									Number of Detected Data	66
76	Number of Distinct Detected Data	63									Number of Non-Detect Data	68
77											Percent Non-Detects	50.75%
78												
79	**Raw Statistics**										**Log-transformed Statistics**	
80	Minimum Detected	0.00109									Minimum Detected	-6.822
81	Maximum Detected	0.0244									Maximum Detected	-3.713
82	Mean of Detected	0.00601									Mean of Detected	-5.494
83	SD of Detected	0.00576									SD of Detected	0.859
84	Minimum Non-Detect	0.001									Minimum Non-Detect	-6.908
85	Maximum Non-Detect	0.04									Maximum Non-Detect	-3.219
86												
87	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	134
88	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
89	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
90												
91	**UCL Statistics**											
92	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
93	Lilliefors Test Statistic	0.197									Lilliefors Test Statistic	0.189
94	5% Lilliefors Critical Value	0.109									5% Lilliefors Critical Value	0.109
95	**Data not Normal at 5% Significance Level**										**Data not Lognormal at 5% Significance Level**	
96												
97	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
98	DL/2 Substitution Method										DL/2 Substitution Method	
99	Mean	0.00483									Mean	-5.62
100	SD	0.00464									SD	0.706
101	95% DL/2 (t) UCL	0.0055									95% H-Stat (DL/2) UCL	0.00516
102												
103	Maximum Likelihood Estimate(MLE) Method	N/A									Log ROS Method	
104	**MLE method failed to converge properly**										Mean in Log Scale	-5.812
105											SD in Log Scale	0.81
106											Mean in Original Scale	0.00428

107											SD in Original Scale	0.0045
108											95% Percentile Bootstrap UCL	0.00495
109											95% BCA Bootstrap UCL	0.00509
110												
111	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
112					k star (bias corrected)	1.407	**Data do not follow a Discernable Distribution (0.05)**					
113					Theta Star	0.00427						
114					nu star	185.7						
115												
116					A-D Test Statistic	2.398	**Nonparametric Statistics**					
117					5% A-D Critical Value	0.77					Kaplan-Meier (KM) Method	
118					K-S Test Statistic	0.77					Mean	0.0042
119					5% K-S Critical Value	0.112					SD	0.00453
120	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.000413
121											95% KM (t) UCL	0.00489
122	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00488
123					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00488
124					Minimum	0.00109					95% KM (bootstrap t) UCL	0.00504
125					Maximum	0.0244					95% KM (BCA) UCL	0.00498
126					Mean	0.00623					95% KM (Percentile Bootstrap) UCL	0.00491
127					Median	0.00595					95% KM (Chebyshev) UCL	0.00601
128					SD	0.00415					97.5% KM (Chebyshev) UCL	0.00678
129					k star	2.608					99% KM (Chebyshev) UCL	0.00831
130					Theta star	0.00239						
131					Nu star	699	**Potential UCLs to Use**					
132					AppChi2	638.6					95% KM (t) UCL	0.00489
133					95% Gamma Approximate UCL	0.00682					95% KM (% Bootstrap) UCL	0.00491
134					95% Adjusted Gamma UCL	0.00682						
135	**Note: DL/2 is not a recommended method.**											
136												
137												
138	**Arsenic, dissolved (no flood)**											
139												
140	**General Statistics**											
141					Number of Valid Data	326					Number of Detected Data	124
142					Number of Distinct Detected Data	111					Number of Non-Detect Data	202
143											Percent Non-Detects	61.96%
144												
145	**Raw Statistics**						**Log-transformed Statistics**					
146					Minimum Detected	0.00105					Minimum Detected	-6.859
147					Maximum Detected	0.157					Maximum Detected	-1.852
148					Mean of Detected	0.0167					Mean of Detected	-5.252
149					SD of Detected	0.0326					SD of Detected	1.347
150					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
151					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
152												
153	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	296
154	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	30
155	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	90.80%
156												
157	**UCL Statistics**											
158	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
159					Lilliefors Test Statistic	0.375					Lilliefors Test Statistic	0.146

160					5% Lilliefors Critical Value	0.0796					5% Lilliefors Critical Value	0.0796
161	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
162												
163	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
164					DL/2 Substitution Method						DL/2 Substitution Method	
165					Mean	0.0084					Mean	-5.581
166					SD	0.0211					SD	0.925
167					95% DL/2 (t) UCL	0.0103					95% H-Stat (DL/2) UCL	0.00676
168												
169					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
170	**MLE yields a negative mean**										Mean in Log Scale	-5.809
171											SD in Log Scale	1.206
172											Mean in Original Scale	0.00829
173											SD in Original Scale	0.0212
174											95% Percentile Bootstrap UCL	0.0103
175											95% BCA Bootstrap UCL	0.0106
176												
177	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
178					k star (bias corrected)	0.534	**Data do not follow a Discernable Distribution (0.05)**					
179					Theta Star	0.0312						
180					nu star	132.4						
181												
182					A-D Test Statistic	12.97	**Nonparametric Statistics**					
183					5% A-D Critical Value	0.815					Kaplan-Meier (KM) Method	
184					K-S Test Statistic	0.815					Mean	0.00784
185					5% K-S Critical Value	0.0878					SD	0.0212
186	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00118
187											95% KM (t) UCL	0.00979
188	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00978
189					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00978
190					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0102
191					Maximum	0.157					95% KM (BCA) UCL	0.0099
192					Mean	0.015					95% KM (Percentile Bootstrap) UCL	0.00989
193					Median	0.011					95% KM (Chebyshev) UCL	0.013
194					SD	0.0209					97.5% KM (Chebyshev) UCL	0.0152
195					k star	0.59					99% KM (Chebyshev) UCL	0.0196
196					Theta star	0.0254						
197					Nu star	384.7	**Potential UCLs to Use**					
198					AppChi2	340.2					95% KM (BCA) UCL	0.0099
199					95% Gamma Approximate UCL	0.0169						
200					95% Adjusted Gamma UCL	0.0169						
201	**Note: DL/2 is not a recommended method.**											
202												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Barium, dissolved (background)

General Statistics

Number of Valid Observations	149	Number of Distinct Observations	137

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0115	Minimum of Log Data	-4.465
Maximum	0.188	Maximum of Log Data	-1.671
Mean	0.06	Mean of log Data	-2.993
Median	0.0488	SD of log Data	0.601
SD	0.0381		
Coefficient of Variation	0.635		
Skewness	1.361		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.163	Lilliefors Test Statistic	0.0451
Lilliefors Critical Value	0.0726	Lilliefors Critical Value	0.0726
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0652	95% H-UCL	0.0658
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0739
95% Adjusted-CLT UCL	0.0655	97.5% Chebyshev (MVUE) UCL	0.0799
95% Modified-t UCL	0.0652	99% Chebyshev (MVUE) UCL	0.0917
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.885	**Data appear Lognormal at 5% Significance Level**	
Theta Star	0.0208		
nu star	859.9		
Approximate Chi Square Value (.05)	792.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0484	95% CLT UCL	0.0651
Adjusted Chi Square Value	792.2	95% Jackknife UCL	0.0652
		95% Standard Bootstrap UCL	0.065
Anderson-Darling Test Statistic	1.423	95% Bootstrap-t UCL	0.0659
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	0.0653
Kolmogorov-Smirnov Test Statistic	0.0846	95% Percentile Bootstrap UCL	0.0652
Kolmogorov-Smirnov 5% Critical Value	0.0774	95% BCA Bootstrap UCL	0.0653
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0736
		97.5% Chebyshev(Mean, Sd) UCL	0.0795
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.091
95% Approximate Gamma UCL	0.0651		
95% Adjusted Gamma UCL	0.0651		
Potential UCL to Use		Use 95% H-UCL	0.0658

	A	B	C	D	E	F	G	H	I	J	K	L
54												
55												
56	**Barium, dissolved (flood)**											
57												
58						**General Statistics**						
59					Number of Valid Data	172			Number of Detected Data			109
60					Number of Distinct Detected Data	93			Number of Non-Detect Data			63
61									Percent Non-Detects			36.63%
62												
63				**Raw Statistics**				**Log-transformed Statistics**				
64					Minimum Detected	0.0186			Minimum Detected			-3.985
65					Maximum Detected	5.3			Maximum Detected			1.668
66					Mean of Detected	0.172			Mean of Detected			-2.853
67					SD of Detected	0.704			SD of Detected			0.947
68					Minimum Non-Detect	0.001			Minimum Non-Detect			-6.908
69					Maximum Non-Detect	0.5			Maximum Non-Detect			-0.693
70												
71	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			168
72	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			4
73	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			97.67%
74												
75						**UCL Statistics**						
76				**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**				
77					Lilliefors Test Statistic	0.425			Lilliefors Test Statistic			0.161
78					5% Lilliefors Critical Value	0.0849			5% Lilliefors Critical Value			0.0849
79				**Data not Normal at 5% Significance Level**				**Data not Lognormal at 5% Significance Level**				
80												
81				**Assuming Normal Distribution**				**Assuming Lognormal Distribution**				
82					DL/2 Substitution Method				DL/2 Substitution Method			
83					Mean	0.186			Mean			-2.418
84					SD	0.561			SD			1.062
85					95% DL/2 (t) UCL	0.257			95% H-Stat (DL/2) UCL			0.255
86												
87					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
88				**MLE yields a negative mean**					Mean in Log Scale			-2.904
89									SD in Log Scale			0.891
90									Mean in Original Scale			0.133
91									SD in Original Scale			0.563
92									95% Percentile Bootstrap UCL			0.214
93									95% BCA Bootstrap UCL			0.259
94												
95				**Gamma Distribution Test with Detected Values Only**				**Data Distribution Test with Detected Values Only**				
96					k star (bias corrected)	0.56			**Data do not follow a Discernable Distribution (0.05)**			
97					Theta Star	0.308						
98					nu star	122						
99												
100					A-D Test Statistic	18.96			**Nonparametric Statistics**			
101					5% A-D Critical Value	0.812			Kaplan-Meier (KM) Method			
102					K-S Test Statistic	0.812			Mean			0.131
103					5% K-S Critical Value	0.0917			SD			0.561
104				**Data not Gamma Distributed at 5% Significance Level**					SE of Mean			0.0431
105									95% KM (t) UCL			0.203
106				**Assuming Gamma Distribution**					95% KM (z) UCL			0.202

107	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.202
108					Minimum	0.0186				95% KM (bootstrap t) UCL		0.497
109					Maximum	5.3				95% KM (BCA) UCL		0.218
110					Mean	0.171				95% KM (Percentile Bootstrap) UCL		0.209
111					Median	0.069				95% KM (Chebyshev) UCL		0.319
112					SD	0.561				97.5% KM (Chebyshev) UCL		0.4
113					k star	0.792				99% KM (Chebyshev) UCL		0.56
114					Theta star	0.216						
115					Nu star	272.4	**Potential UCLs to Use**					
116					AppChi2	235.2				95% KM (BCA) UCL		0.218
117					95% Gamma Approximate UCL	0.198						
118					95% Adjusted Gamma UCL	0.198						
119	**Note: DL/2 is not a recommended method.**											
120												
121												
122	**Barium, dissolved (no flood)**											
123												
124	**General Statistics**											
125					Number of Valid Data	387				Number of Detected Data		252
126					Number of Distinct Detected Data	202				Number of Non-Detect Data		135
127										Percent Non-Detects		34.88%
128												
129	**Raw Statistics**						**Log-transformed Statistics**					
130					Minimum Detected	0.00917				Minimum Detected		-4.692
131					Maximum Detected	0.944				Maximum Detected		-0.0576
132					Mean of Detected	0.0617				Mean of Detected		-2.974
133					SD of Detected	0.0656				SD of Detected		0.565
134					Minimum Non-Detect	0.3				Minimum Non-Detect		-1.204
135					Maximum Non-Detect	0.5				Maximum Non-Detect		-0.693
136												
137	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		386
138	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
139	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		99.74%
140												
141	**UCL Statistics**											
142	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
143					Lilliefors Test Statistic	0.243				Lilliefors Test Statistic		0.101
144					5% Lilliefors Critical Value	0.0558				5% Lilliefors Critical Value		0.0558
145	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
146												
147	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
148					DL/2 Substitution Method					DL/2 Substitution Method		
149					Mean	0.0979				Mean		-2.57
150					SD	0.0756				SD		0.724
151					95% DL/2 (t) UCL	0.104				95% H-Stat (DL/2) UCL		0.144
152												
153					Maximum Likelihood Estimate(MLE) Method	N/A				Log ROS Method		
154	**MLE method failed to converge properly**									Mean in Log Scale		-2.978
155										SD in Log Scale		0.549
156										Mean in Original Scale		0.0603
157										SD in Original Scale		0.0559
158										95% Percentile Bootstrap UCL		0.0653
159										95% BCA Bootstrap UCL		0.0671

	A	B	C	D	E	F	G	H	I	J	K	L
160												
161	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
162					k star (bias corrected)	2.794	**Data do not follow a Discernable Distribution (0.05)**					
163					Theta Star	0.0221						
164					nu star	1408						
165												
166					A-D Test Statistic	5.834	**Nonparametric Statistics**					
167					5% A-D Critical Value	0.761					Kaplan-Meier (KM) Method	
168					K-S Test Statistic	0.761					Mean	0.0601
169					5% K-S Critical Value	0.0581					SD	0.056
170	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00308
171											95% KM (t) UCL	0.0652
172	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0652
173					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0652
174					Minimum	0.00917					95% KM (bootstrap t) UCL	0.0678
175					Maximum	0.944					95% KM (BCA) UCL	0.0657
176					Mean	0.0618					95% KM (Percentile Bootstrap) UCL	0.0653
177					Median	0.058					95% KM (Chebyshev) UCL	0.0736
178					SD	0.0534					97.5% KM (Chebyshev) UCL	0.0794
179					k star	3.963					99% KM (Chebyshev) UCL	0.0908
180					Theta star	0.0156						
181					Nu star	3068	**Potential UCLs to Use**					
182					AppChi2	2940					95% KM (BCA) UCL	0.0657
183					95% Gamma Approximate UCL	0.0645						
184					95% Adjusted Gamma UCL	0.0645						
185	**Note: DL/2 is not a recommended method.**											
186												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Beryllium, dissolved (background)

General Statistics

Number of Valid Data	149	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	148
		Percent Non-Detects	99.33%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Beryllium, dissolved (background) was not processed!

Beryllium, dissolved (flood)

General Statistics

Number of Valid Data	79	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	78
		Percent Non-Detects	98.73%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Beryllium, dissolved (flood) was not processed!

Beryllium, dissolved (no flood)

General Statistics

Number of Valid Data	295	Number of Detected Data	19
Number of Distinct Detected Data	13	Number of Non-Detect Data	276
		Percent Non-Detects	93.56%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.0011	Minimum Detected	-6.812
Maximum Detected	0.0088	Maximum Detected	-4.733
Mean of Detected	0.00232	Mean of Detected	-6.196
SD of Detected	0.00166	SD of Detected	0.466
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	295
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0

54	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
55												
56	**UCL Statistics**											
57	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
58	Lilliefors Test Statistic					0.544	Lilliefors Test Statistic					0.835
59	5% Lilliefors Critical Value					0.901	5% Lilliefors Critical Value					0.901
60	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
61												
62	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
63	DL/2 Substitution Method						DL/2 Substitution Method					
64	Mean					0.0009725	Mean					-7.166
65	SD					0.0008892	SD					0.615
66	95% DL/2 (t) UCL					0.00106	95% H-Stat (DL/2) UCL					0.0009821
67												
68	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
69	**MLE method failed to converge properly**						Mean in Log Scale					-8.147
70							SD in Log Scale					1.03
71							Mean in Original Scale					0.0004957
72							SD in Original Scale					0.0007089
73							95% Percentile Bootstrap UCL					0.0005674
74							95% BCA Bootstrap UCL					0.0005789
75												
76	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
77	k star (bias corrected)					3.406	**Data do not follow a Discernable Distribution (0.05)**					
78	Theta Star					0.0006815						
79	nu star					129.4						
80												
81	A-D Test Statistic					1.39	**Nonparametric Statistics**					
82	5% A-D Critical Value					0.745	Kaplan-Meier (KM) Method					
83	K-S Test Statistic					0.745	Mean					0.0012
84	5% K-S Critical Value					0.199	SD					0.0005301
85	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					3.357E-05
86							95% KM (t) UCL					0.00125
87	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00125
88	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00125
89	Minimum					0.0001657	95% KM (bootstrap t) UCL					0.00129
90	Maximum					0.00984	95% KM (BCA) UCL					0.00149
91	Mean					0.00658	95% KM (Percentile Bootstrap) UCL					0.00136
92	Median					0.00714	95% KM (Chebyshev) UCL					0.00135
93	SD					0.00238	97.5% KM (Chebyshev) UCL					0.00141
94	k star					4.811	99% KM (Chebyshev) UCL					0.00153
95	Theta star					0.00137						
96	Nu star					2839	**Potential UCLs to Use**					
97	AppChi2					2716	95% KM (t) UCL					0.00125
98	95% Gamma Approximate UCL					0.00688	95% KM (% Bootstrap) UCL					0.00136
99	95% Adjusted Gamma UCL					0.00688						
100	**Note: DL/2 is not a recommended method.**											
101												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Cadmium, dissolved (flood)

General Statistics

Number of Valid Data	79	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	79
		Percent Non-Detects	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Cadmium, dissolved (flood) was not processed!

Cadmium, dissolved (no flood)

General Statistics

Number of Valid Data	295	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	294
		Percent Non-Detects	99.66%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Cadmium, dissolved (no flood) was not processed!

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Chloride (background)											
10												
11	General Statistics											
12	Number of Valid Observations			149		Number of Distinct Observations					125	
13												
14	Raw Statistics					Log-transformed Statistics						
15	Minimum			24.4		Minimum of Log Data					3.195	
16	Maximum			4070		Maximum of Log Data					8.311	
17	Mean			365.4		Mean of log Data					5.087	
18	Median			145		SD of log Data					1.083	
19	SD			767.9								
20	Coefficient of Variation			2.102								
21	Skewness			3.933								
22												
23	Relevant UCL Statistics											
24	Normal Distribution Test					Lognormal Distribution Test						
25	Lilliefors Test Statistic			0.393		Lilliefors Test Statistic					0.128	
26	Lilliefors Critical Value			0.0726		Lilliefors Critical Value					0.0726	
27	Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level						
28												
29	Assuming Normal Distribution					Assuming Lognormal Distribution						
30	95% Student's-t UCL			469.5		95% H-UCL					355.4	
31	95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL					427.9	
32	95% Adjusted-CLT UCL			490.5		97.5% Chebyshev (MVUE) UCL					487.9	
33	95% Modified-t UCL			472.9		99% Chebyshev (MVUE) UCL					605.7	
34												
35	Gamma Distribution Test					Data Distribution						
36	k star (bias corrected)			0.727		Data do not follow a Discernable Distribution (0.05)						
37	Theta Star			502.5								
38	nu star			216.7								
39	Approximate Chi Square Value (.05)			183.6		Nonparametric Statistics						
40	Adjusted Level of Significance			0.0484		95% CLT UCL					468.8	
41	Adjusted Chi Square Value			183.3		95% Jackknife UCL					469.5	
42						95% Standard Bootstrap UCL					471.2	
43	Anderson-Darling Test Statistic			12.41		95% Bootstrap-t UCL					500.4	
44	Anderson-Darling 5% Critical Value			0.797		95% Hall's Bootstrap UCL					481.6	
45	Kolmogorov-Smirnov Test Statistic			0.251		95% Percentile Bootstrap UCL					469.2	
46	Kolmogorov-Smirnov 5% Critical Value			0.0799		95% BCA Bootstrap UCL					486.3	
47	Data not Gamma Distributed at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL					639.6	
48						97.5% Chebyshev(Mean, Sd) UCL					758.2	
49	Assuming Gamma Distribution					99% Chebyshev(Mean, Sd) UCL					991.3	
50	95% Approximate Gamma UCL			431.2								
51	95% Adjusted Gamma UCL			431.9								
52												
53	Potential UCL to Use					Use 97.5% Chebyshev (Mean, Sd) UCL					758.2	

	A	B	C	D	E	F	G	H	I	J	K	L
54												
55												
56	**Chloride (flood)**											
57												
58						**General Statistics**							
59						Number of Valid Observations	416				Number of Distinct Observations	326
60												
61						**Raw Statistics**					**Log-transformed Statistics**	
62						Minimum	72				Minimum of Log Data	4.277
63						Maximum	22300				Maximum of Log Data	10.01
64						Mean	3811				Mean of log Data	7.694
65						Median	3005				SD of log Data	1.242
66						SD	3912					
67						Coefficient of Variation	1.027					
68						Skewness	2.332					
69												
70						**Relevant UCL Statistics**							
71						**Normal Distribution Test**					**Lognormal Distribution Test**	
72						Lilliefors Test Statistic	0.172				Lilliefors Test Statistic	0.135
73						Lilliefors Critical Value	0.0434				Lilliefors Critical Value	0.0434
74						**Data not Normal at 5% Significance Level**					**Data not Lognormal at 5% Significance Level**	
75												
76						**Assuming Normal Distribution**					**Assuming Lognormal Distribution**	
77						95% Student's-t UCL	4127				95% H-UCL	5460
78						**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL	6386
79						95% Adjusted-CLT UCL	4150				97.5% Chebyshev (MVUE) UCL	7103
80						95% Modified-t UCL	4131				99% Chebyshev (MVUE) UCL	8511
81												
82						**Gamma Distribution Test**					**Data Distribution**	
83						k star (bias corrected)	1.035				**Data do not follow a Discernable Distribution (0.05)**	
84						Theta Star	3681					
85						nu star	861.4					
86						Approximate Chi Square Value (.05)	794.3				**Nonparametric Statistics**	
87						Adjusted Level of Significance	0.0494				95% CLT UCL	4126
88						Adjusted Chi Square Value	794				95% Jackknife UCL	4127
89											95% Standard Bootstrap UCL	4122
90						Anderson-Darling Test Statistic	3.254				95% Bootstrap-t UCL	4177
91						Anderson-Darling 5% Critical Value	0.784				95% Hall's Bootstrap UCL	4152
92						Kolmogorov-Smirnov Test Statistic	0.0682				95% Percentile Bootstrap UCL	4128
93						Kolmogorov-Smirnov 5% Critical Value	0.0457				95% BCA Bootstrap UCL	4136
94						**Data not Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL	4647
95											97.5% Chebyshev(Mean, Sd) UCL	5009
96						**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL	5719
97						95% Approximate Gamma UCL	4133					
98						95% Adjusted Gamma UCL	4134					
99												
100						**Potential UCL to Use**					Use 97.5% Chebyshev (Mean, Sd) UCL	5009
101												
102												
103	**Chloride (no flood)**											
104												
105						**General Statistics**							
106						Number of Valid Observations	409				Number of Distinct Observations	312

Raw Statistics		
Minimum	18.9	
Maximum	7510	
Mean	1869	
Median	1600	
SD	1618	
Coefficient of Variation	0.866	
Skewness	1.209	
Log-transformed Statistics		
Minimum of Log Data	2.939	
Maximum of Log Data	8.924	
Mean of log Data	7.089	
SD of log Data	1.049	

Relevant UCL Statistics

Normal Distribution Test		
Lilliefors Test Statistic	0.137	
Lilliefors Critical Value	0.0438	
Data not Normal at 5% Significance Level		
Lognormal Distribution Test		
Lilliefors Test Statistic	0.121	
Lilliefors Critical Value	0.0438	
Data not Lognormal at 5% Significance Level		

Assuming Normal Distribution		
95% Student's-t UCL	2001	
95% UCLs (Adjusted for Skewness)		
95% Adjusted-CLT UCL	2006	
95% Modified-t UCL	2002	
Assuming Lognormal Distribution		
95% H-UCL	2320	
95% Chebyshev (MVUE) UCL	2652	
97.5% Chebyshev (MVUE) UCL	2902	
99% Chebyshev (MVUE) UCL	3395	

Gamma Distribution Test		
k star (bias corrected)	1.257	
Theta Star	1487	
nu star	1028	
Approximate Chi Square Value (.05)	954.8	
Adjusted Level of Significance	0.0494	
Adjusted Chi Square Value	954.5	
Anderson-Darling Test Statistic	3.343	
Anderson-Darling 5% Critical Value	0.778	
Kolmogorov-Smirnov Test Statistic	0.0767	
Kolmogorov-Smirnov 5% Critical Value	0.0458	
Data not Gamma Distributed at 5% Significance Level		
Assuming Gamma Distribution		
95% Approximate Gamma UCL	2013	
95% Adjusted Gamma UCL	2014	
Data Distribution		
Data do not follow a Discernable Distribution (0.05)		
Nonparametric Statistics		
95% CLT UCL	2001	
95% Jackknife UCL	2001	
95% Standard Bootstrap UCL	2001	
95% Bootstrap-t UCL	2007	
95% Hall's Bootstrap UCL	2014	
95% Percentile Bootstrap UCL	2002	
95% BCA Bootstrap UCL	2007	
95% Chebyshev(Mean, Sd) UCL	2218	
97.5% Chebyshev(Mean, Sd) UCL	2369	
99% Chebyshev(Mean, Sd) UCL	2666	

Potential UCL to Use	
Use 97.5% Chebyshev (Mean, Sd) UCL	2369

General UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Chromium, dissolved (background)

General Statistics

Number of Valid Data	148	Number of Detected Data	105
Number of Distinct Detected Data	88	Number of Non-Detect Data	43
		Percent Non-Detects	29.05%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.00104	Minimum Detected	-6.869
Maximum Detected	0.0404	Maximum Detected	-3.209
Mean of Detected	0.0121	Mean of Detected	-4.742
SD of Detected	0.00906	SD of Detected	0.887
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.168	Lilliefors Test Statistic	0.168
5% Lilliefors Critical Value	0.0865	5% Lilliefors Critical Value	0.0865
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00872	Mean	-5.573
SD	0.00927	SD	1.501
95% DL/2 (t) UCL	0.00998	95% H-Stat (DL/2) UCL	0.00941
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00662	Mean in Log Scale	-5.315
SD	0.0119	SD in Log Scale	1.207
95% MLE (t) UCL	0.00824	Mean in Original Scale	0.00898
95% MLE (Tiku) UCL	0.00833	SD in Original Scale	0.00905
		95% Percentile Bootstrap UCL	0.0102
		95% BCA Bootstrap UCL	0.0103
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	1.639	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.00737		
nu star	344.2		
A-D Test Statistic	1.109	**Nonparametric Statistics**	
5% A-D Critical Value	0.768	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.768	Mean	0.00887
5% K-S Critical Value	0.0896	SD	0.0091

54	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0007515
55											95% KM (t) UCL	0.0101
56	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0101
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0101
58	Minimum	1E-09									95% KM (bootstrap t) UCL	0.0102
59	Maximum	0.0404									95% KM (BCA) UCL	0.0102
60	Mean	0.00985									95% KM (Percentile Bootstrap) UCL	0.0102
61	Median	0.0087									95% KM (Chebyshev) UCL	0.0122
62	SD	0.0086									97.5% KM (Chebyshev) UCL	0.0136
63	k star	0.469									99% KM (Chebyshev) UCL	0.0164
64	Theta star	0.021										
65	Nu star	138.9									**Potential UCLs to Use**	
66	AppChi2	112.7									95% KM (BCA) UCL	0.0102
67	95% Gamma Approximate UCL	0.0121										
68	95% Adjusted Gamma UCL	0.0122										
69	**Note: DL/2 is not a recommended method.**											
70												
71												
72	**Chromium, dissolved (flood)**											
73												
74	**General Statistics**											
75	Number of Valid Data	1833									Number of Detected Data	1013
76	Number of Distinct Detected Data	704									Number of Non-Detect Data	820
77											Percent Non-Detects	44.74%
78												
79	**Raw Statistics**										**Log-transformed Statistics**	
80	Minimum Detected	0.001									Minimum Detected	-6.908
81	Maximum Detected	16.4									Maximum Detected	2.797
82	Mean of Detected	1.804									Mean of Detected	-1.634
83	SD of Detected	2.976									SD of Detected	2.817
84	Minimum Non-Detect	0.001									Minimum Non-Detect	-6.908
85	Maximum Non-Detect	0.8									Maximum Non-Detect	-0.223
86												
87	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	1423
88	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	410
89	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	77.63%
90												
91	**UCL Statistics**											
92	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
93	Lilliefors Test Statistic	0.272									Lilliefors Test Statistic	0.11
94	5% Lilliefors Critical Value	0.0278									5% Lilliefors Critical Value	0.0278
95	**Data not Normal at 5% Significance Level**										**Data not Lognormal at 5% Significance Level**	
96												
97	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
98	DL/2 Substitution Method										DL/2 Substitution Method	
99	Mean	0.999									Mean	-4.178
100	SD	2.386									SD	3.574
101	95% DL/2 (t) UCL	1.09									95% H-Stat (DL/2) UCL	N/A
102												
103	Maximum Likelihood Estimate(MLE) Method	N/A									Log ROS Method	
104	**MLE yields a negative mean**										Mean in Log Scale	-4.557
105											SD in Log Scale	4.178
106											Mean in Original Scale	0.998

107											SD in Original Scale	2.387
108											95% Percentile Bootstrap UCL	1.085
109											95% BCA Bootstrap UCL	1.092
110												
111	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
112					k star (bias corrected)	0.308	**Data do not follow a Discernable Distribution (0.05)**					
113					Theta Star	5.852						
114					nu star	624.7						
115												
116					A-D Test Statistic	15.93	**Nonparametric Statistics**					
117					5% A-D Critical Value	0.869					Kaplan-Meier (KM) Method	
118					K-S Test Statistic	0.869					Mean	0.998
119					5% K-S Critical Value	0.031					SD	2.386
120	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0558
121											95% KM (t) UCL	1.09
122	**Assuming Gamma Distribution**										95% KM (z) UCL	1.09
123					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.09
124					Minimum	1E-09					95% KM (bootstrap t) UCL	1.094
125					Maximum	16.4					95% KM (BCA) UCL	1.095
126					Mean	1.324					95% KM (Percentile Bootstrap) UCL	1.092
127					Median	0.196					95% KM (Chebyshev) UCL	1.241
128					SD	2.451					97.5% KM (Chebyshev) UCL	1.346
129					k star	0.13					99% KM (Chebyshev) UCL	1.553
130					Theta star	10.22						
131					Nu star	474.9	**Potential UCLs to Use**					
132					AppChi2	425.4					97.5% KM (Chebyshev) UCL	1.346
133					95% Gamma Approximate UCL	1.478						
134					95% Adjusted Gamma UCL	1.478						
135	**Note: DL/2 is not a recommended method.**											
136												
137												
138	**Chromium, dissolved (no flood)**											
139												
140							**General Statistics**					
141					Number of Valid Data	1048					Number of Detected Data	875
142					Number of Distinct Detected Data	561					Number of Non-Detect Data	173
143											Percent Non-Detects	16.51%
144												
145					**Raw Statistics**		**Log-transformed Statistics**					
146					Minimum Detected	0.001	Log Statistics Not Avaliable					
147					Maximum Detected	15.6						
148					Mean of Detected	1.09						
149					Mean of Detected	1.09						
150					Mean of Detected	1.09						
151					Maximum Non-Detect	0.8						
152	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	752
153	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	296
154	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	71.76%
155												
156							**UCL Statistics**					
157	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
158					Lilliefors Test Statistic	0.279					Not Available	
159					5% Lilliefors Critical Value	0.03						

	A	B	C	D	E	F	G	H	I	J	K	L
160	**Data not Normal at 5% Significance Level**											
161												
162	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
163					DL/2 Substitution Method						DL/2 Substitution Method	N/A
164					Mean	0.912						
165					SD	1.746						
166					95% DL/2 (t) UCL	1.001						
167												
168					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	N/A
169					Mean	-1.458						
170					SD	3.799						
171					95% MLE (t) UCL	-1.265						
172					95% MLE (Tiku) UCL	-1.104						
173												
174	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
175	Gamma Statistics Not Available						Data do not follow a Discernable Distribution (0.05)					
176												
177												
178	**Potential UCLs to Use**						**Nonparametric Statistics**					
179					97.5% KM (Chebyshev) UCL	1.248					Kaplan-Meier (KM) Method	
180											Mean	0.911
181											SD	1.746
182											SE of Mean	0.054
183											95% KM (t) UCL	1
184											95% KM (z) UCL	1
185											95% KM (jackknife) UCL	1
186											95% KM (bootstrap t) UCL	1.01
187											95% KM (BCA) UCL	0.992
188											95% KM (Percentile Bootstrap) UCL	1.002
189											95% KM (Chebyshev) UCL	1.146
190											97.5% KM (Chebyshev) UCL	1.248
191											99% KM (Chebyshev) UCL	1.448
192	**Note: DL/2 is not a recommended method.**											
193												

General UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Cobalt, dissolved (background)

General Statistics

Number of Valid Data	149	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	145
		Percent Non-Detects	97.32%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.00101	Minimum Detected	-6.898
Maximum Detected	0.00164	Maximum Detected	-6.413
Mean of Detected	0.00136	Mean of Detected	-6.619
SD of Detected	0.0002611	SD of Detected	0.203
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.967	Lilliefors Test Statistic	0.94
5% Lilliefors Critical Value	0.748	5% Lilliefors Critical Value	0.748
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.000523	Mean	-7.575
SD	0.0001436	SD	0.162
95% DL/2 (t) UCL	0.0005424	95% H-Stat (DL/2) UCL	0.0005262
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-8.452
		SD in Log Scale	0.797
		Mean in Original Scale	0.0002922
		SD in Original Scale	0.0002621
		95% Percentile Bootstrap UCL	0.0003282
		95% BCA Bootstrap UCL	0.0003351

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**
k star (bias corrected)	8.57	**Data appear Normal at 5% Significance Level**

54					Theta Star	0.0001581						
55					nu star	68.56						
56												
57					A-D Test Statistic	0.294	**Nonparametric Statistics**					
58					5% A-D Critical Value	0.657				Kaplan-Meier (KM) Method		
59					K-S Test Statistic	0.657				Mean		0.00102
60					5% K-S Critical Value	0.394				SD		6.695E-05
61	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		6.333E-06
62										95% KM (t) UCL		0.00103
63	**Assuming Gamma Distribution**									95% KM (z) UCL		0.00103
64					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.00124
65					Minimum	0.00101				95% KM (bootstrap t) UCL		0.00103
66					Maximum	0.00408				95% KM (BCA) UCL		0.00164
67					Mean	0.00324				95% KM (Percentile Bootstrap) UCL		0.00142
68					Median	0.00344				95% KM (Chebyshev) UCL		0.00105
69					SD	0.0007255				97.5% KM (Chebyshev) UCL		0.00106
70					k star	14.88				99% KM (Chebyshev) UCL		0.00108
71					Theta star	0.0002177						
72					Nu star	4436	**Potential UCLs to Use**					
73					AppChi2	4282				95% KM (t) UCL		0.00103
74					95% Gamma Approximate UCL	0.00336				95% KM (Percentile Bootstrap) UCL		0.00142
75					95% Adjusted Gamma UCL	N/A						
76	**Note: DL/2 is not a recommended method.**											
77												
78												
79	**Cobalt, dissolved (flood)**											
80												
81	**General Statistics**											
82					Number of Valid Data	79				Number of Detected Data		8
83					Number of Distinct Detected Data	8				Number of Non-Detect Data		71
84										Percent Non-Detects		89.87%
85												
86	**Raw Statistics**						**Log-transformed Statistics**					
87					Minimum Detected	0.00108				Minimum Detected		-6.831
88					Maximum Detected	0.005				Maximum Detected		-5.298
89					Mean of Detected	0.0017				Mean of Detected		-6.529
90					SD of Detected	0.00134				SD of Detected		0.505
91					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908
92					Maximum Non-Detect	0.012				Maximum Non-Detect		-4.423
93												
94	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		79
95	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
96	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
97												
98	**Warning: There are only 8 Detected Values in this data**											
99	**Note: It should be noted that even though bootstrap may be performed on this data set**											
100	**the resulting calculations may not be reliable enough tp draw conclusions**											
101												
102	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
103												
104												
105	**UCL Statistics**											
106	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					

107				Lilliefors Test Statistic	0.495					Lilliefors Test Statistic	0.585
108				5% Lilliefors Critical Value	0.818					5% Lilliefors Critical Value	0.818
109	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**				
110											
111	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**				
112				DL/2 Substitution Method						DL/2 Substitution Method	
113				Mean	0.00144					Mean	-6.778
114				SD	0.00102					SD	0.706
115				95% DL/2 (t) UCL	0.00164					95% H-Stat (DL/2) UCL	0.0018
116											
117				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
118	**MLE method failed to converge properly**									Mean in Log Scale	-7.826
119										SD in Log Scale	0.813
120										Mean in Original Scale	0.0005645
121										SD in Original Scale	0.0006285
122										95% Percentile Bootstrap UCL	0.000678
123										95% BCA Bootstrap UCL	0.0007305
124											
125	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**				
126				k star (bias corrected)	2.232		**Data do not follow a Discernable Distribution (0.05)**				
127				Theta Star	0.0007622						
128				nu star	35.71						
129											
130				A-D Test Statistic	1.79		**Nonparametric Statistics**				
131				5% A-D Critical Value	0.72					Kaplan-Meier (KM) Method	
132				K-S Test Statistic	0.72					Mean	0.00116
133				5% K-S Critical Value	0.296					SD	0.0004441
134	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	5.457E-05
135										95% KM (t) UCL	0.00125
136	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00125
137				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00124
138				Minimum	0.000432					95% KM (bootstrap t) UCL	0.00147
139				Maximum	0.0064					95% KM (BCA) UCL	0.00139
140				Mean	0.00378					95% KM (Percentile Bootstrap) UCL	0.0013
141				Median	0.00403					95% KM (Chebyshev) UCL	0.0014
142				SD	0.00166					97.5% KM (Chebyshev) UCL	0.0015
143				k star	3.662					99% KM (Chebyshev) UCL	0.0017
144				Theta star	0.00103						
145				Nu star	578.6		**Potential UCLs to Use**				
146				AppChi2	523.8					95% KM (t) UCL	0.00125
147				95% Gamma Approximate UCL	0.00417					95% KM (% Bootstrap) UCL	0.0013
148				95% Adjusted Gamma UCL	0.00418						
149	**Note: DL/2 is not a recommended method.**										
150											
151											
152	**Cobalt, dissolved (no flood)**										
153											
154	**General Statistics**										
155				Number of Valid Data	295					Number of Detected Data	5
156				Number of Distinct Detected Data	5					Number of Non-Detect Data	290
157										Percent Non-Detects	98.31%
158											
159	**Raw Statistics**						**Log-transformed Statistics**				

160				Minimum Detected	0.00101					Minimum Detected	-6.898	
161				Maximum Detected	0.01					Maximum Detected	-4.605	
162				Mean of Detected	0.0029					Mean of Detected	-6.358	
163				SD of Detected	0.00397					SD of Detected	0.983	
164				Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908	
165				Maximum Non-Detect	0.005					Maximum Non-Detect	-5.298	
166												
167	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	294	
168	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	1	
169	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	99.66%	
170												
171	**Warning: There are only 5 Detected Values in this data**											
172	**Note: It should be noted that even though bootstrap may be performed on this data set**											
173	**the resulting calculations may not be reliable enough tp draw conclusions**											
174												
175	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
176												
177												
178	**UCL Statistics**											
179	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
180				Lilliefors Test Statistic	0.575					Lilliefors Test Statistic	0.632	
181				5% Lilliefors Critical Value	0.762					5% Lilliefors Critical Value	0.762	
182	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**		
183												
184	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
185				DL/2 Substitution Method						DL/2 Substitution Method		
186				Mean	0.0016					Mean	-6.657	
187				SD	0.0009884					SD	0.708	
188				95% DL/2 (t) UCL	0.00169					95% H-Stat (DL/2) UCL	0.0018	
189												
190				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
191	**MLE method failed to converge properly**									Mean in Log Scale	-11.04	
192										SD in Log Scale	2.03	
193										Mean in Original Scale	0.0001221	
194										SD in Original Scale	0.0006169	
195										95% Percentile Bootstrap UCL	0.0001891	
196										95% BCA Bootstrap UCL	0.0002488	
197												
198	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
199				k star (bias corrected)	0.577					**Data do not follow a Discernable Distribution (0.05)**		
200				Theta Star	0.00502							
201				nu star	5.774							
202												
203				A-D Test Statistic	1.161					**Nonparametric Statistics**		
204				5% A-D Critical Value	0.69					Kaplan-Meier (KM) Method		
205				K-S Test Statistic	0.69					Mean	0.00104	
206				5% K-S Critical Value	0.364					SD	0.0005231	
207	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	3.414E-05	
208										95% KM (t) UCL	0.0011	
209	**Assuming Gamma Distribution**									95% KM (z) UCL	0.0011	
210				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00109	
211				Minimum	1E-09					95% KM (bootstrap t) UCL	0.00144	
212				Maximum	1.597					95% KM (BCA) UCL	0.00134	

	A	B	C	D	E	F	G	H	I	J	K	L
213					Mean	0.566			95% KM (Percentile Bootstrap) UCL			0.00125
214					Median	0.466			95% KM (Chebyshev) UCL			0.00119
215					SD	0.471			97.5% KM (Chebyshev) UCL			0.00126
216					k star	0.705			99% KM (Chebyshev) UCL			0.00138
217					Theta star	0.803						
218					Nu star	415.9			**Potential UCLs to Use**			
219					AppChi2	369.6					95% KM (t) UCL	0.0011
220				95% Gamma Approximate UCL		0.637					95% KM (% Bootstrap) UCL	0.00125
221				95% Adjusted Gamma UCL		0.637						
222	**Note: DL/2 is not a recommended method.**											
223												

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Copper, dissolved (background)											
10												
11						General Statistics						
12						Number of Valid Data	149			Number of Detected Data		104
13						Number of Distinct Detected Data	96			Number of Non-Detect Data		45
14										Percent Non-Detects		30.20%
15												
16				Raw Statistics						Log-transformed Statistics		
17						Minimum Detected	0.00101			Minimum Detected		-6.898
18						Maximum Detected	0.0205			Maximum Detected		-3.887
19						Mean of Detected	0.00417			Mean of Detected		-5.756
20						SD of Detected	0.00404			SD of Detected		0.689
21						Minimum Non-Detect	0.001			Minimum Non-Detect		-6.908
22						Maximum Non-Detect	0.00325			Maximum Non-Detect		-5.729
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		100
25	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		49
26	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		67.11%
27												
28						UCL Statistics						
29				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
30						Lilliefors Test Statistic	0.254			Lilliefors Test Statistic		0.0895
31						5% Lilliefors Critical Value	0.0869			5% Lilliefors Critical Value		0.0869
32				Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level		
33												
34				Assuming Normal Distribution						Assuming Lognormal Distribution		
35						DL/2 Substitution Method				DL/2 Substitution Method		
36						Mean	0.00308			Mean		-6.295
37						SD	0.00376			SD		1.01
38						95% DL/2 (t) UCL	0.00359			95% H-Stat (DL/2) UCL		0.00306
39												
40						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
41				MLE yields a negative mean						Mean in Log Scale		-6.233
42										SD in Log Scale		0.962
43										Mean in Original Scale		0.00313
44										SD in Original Scale		0.00373
45										95% Percentile Bootstrap UCL		0.00363
46										95% BCA Bootstrap UCL		0.00372
47												
48				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
49						k star (bias corrected)	1.914			Data do not follow a Discernable Distribution (0.05)		
50						Theta Star	0.00218					
51						nu star	398					
52												
53						A-D Test Statistic	3.43			Nonparametric Statistics		

54				5% A-D Critical Value	0.765					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.765					Mean		0.00322
56				5% K-S Critical Value	0.0896					SD		0.00366
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.0003011
58										95% KM (t) UCL		0.00372
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.00372
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00372
61				Minimum	1E-09					95% KM (bootstrap t) UCL		0.00383
62				Maximum	0.0205					95% KM (BCA) UCL		0.00375
63				Mean	0.00348					95% KM (Percentile Bootstrap) UCL		0.00373
64				Median	0.00278					95% KM (Chebyshev) UCL		0.00453
65				SD	0.00361					97.5% KM (Chebyshev) UCL		0.0051
66				k star	0.594					99% KM (Chebyshev) UCL		0.00622
67				Theta star	0.00586							
68				Nu star	176.9					**Potential UCLs to Use**		
69				AppChi2	147.1					95% KM (BCA) UCL		0.00375
70				95% Gamma Approximate UCL	0.00418							
71				95% Adjusted Gamma UCL	0.00419							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Copper, dissolved (flood)**											
76												
77					**General Statistics**							
78				Number of Valid Data	345					Number of Detected Data		124
79				Number of Distinct Detected Data	88					Number of Non-Detect Data		221
80										Percent Non-Detects		64.06%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.00107					Minimum Detected		-6.84
84				Maximum Detected	0.306					Maximum Detected		-1.184
85				Mean of Detected	0.0183					Mean of Detected		-4.866
86				SD of Detected	0.0413					SD of Detected		1.091
87				Minimum Non-Detect	0.001					Minimum Non-Detect		-6.908
88				Maximum Non-Detect	0.4					Maximum Non-Detect		-0.916
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		345
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
93												
94					**UCL Statistics**							
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Lilliefors Test Statistic	0.343					Lilliefors Test Statistic		0.139
97				5% Lilliefors Critical Value	0.0796					5% Lilliefors Critical Value		0.0796
98				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	0.0142					Mean		-5.225
103				SD	0.0384					SD		1.136
104				95% DL/2 (t) UCL	0.0176					95% H-Stat (DL/2) UCL		0.0112
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	**MLE method failed to converge properly**									Mean in Log Scale		-5.661
108										SD in Log Scale		1.207
109										Mean in Original Scale		0.00887
110										SD in Original Scale		0.0258
111										95% Percentile Bootstrap UCL		0.0112
112										95% BCA Bootstrap UCL		0.0119
113												
114	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
115				k star (bias corrected)		0.687				**Data do not follow a Discernable Distribution (0.05)**		
116				Theta Star		0.0267						
117				nu star		170.3						
118												
119				A-D Test Statistic		11.74				**Nonparametric Statistics**		
120				5% A-D Critical Value		0.8				Kaplan-Meier (KM) Method		
121				K-S Test Statistic		0.8				Mean		0.0089
122				5% K-S Critical Value		0.0868				SD		0.026
123	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.00143
124										95% KM (t) UCL		0.0113
125	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0113
126				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0113
127				Minimum		1E-09				95% KM (bootstrap t) UCL		0.0124
128				Maximum		0.306				95% KM (BCA) UCL		0.0117
129				Mean		0.0194				95% KM (Percentile Bootstrap) UCL		0.0113
130				Median		0.0071				95% KM (Chebyshev) UCL		0.0151
131				SD		0.0306				97.5% KM (Chebyshev) UCL		0.0178
132				k star		0.176				99% KM (Chebyshev) UCL		0.0231
133				Theta star		0.11						
134				Nu star		121.6				**Potential UCLs to Use**		
135				AppChi2		97.11				95% KM (BCA) UCL		0.0117
136				95% Gamma Approximate UCL		0.0243						
137				95% Adjusted Gamma UCL		0.0243						
138	**Note: DL/2 is not a recommended method.**											
139												
140												
141	**Copper, dissolved (no flood)**											
142												
143							**General Statistics**					
144				Number of Valid Data		704				Number of Detected Data		234
145				Number of Distinct Detected Data		142				Number of Non-Detect Data		470
146										Percent Non-Detects		66.76%
147												
148	**Raw Statistics**									**Log-transformed Statistics**		
149				Minimum Detected		0.00103				Minimum Detected		-6.878
150				Maximum Detected		0.111				Maximum Detected		-2.198
151				Mean of Detected		0.00844				Mean of Detected		-5.225
152				SD of Detected		0.0118				SD of Detected		0.866
153				Minimum Non-Detect		0.001				Minimum Non-Detect		-6.908
154				Maximum Non-Detect		0.4				Maximum Non-Detect		-0.916
155												
156	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		704
157	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
158	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160	**UCL Statistics**											
161	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
162					Lilliefors Test Statistic	0.266					Lilliefors Test Statistic	0.0964
163					5% Lilliefors Critical Value	0.0579					5% Lilliefors Critical Value	0.0579
164	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
165												
166	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
167					DL/2 Substitution Method						DL/2 Substitution Method	
168					Mean	0.00882					Mean	-5.44
169					SD	0.0252					SD	0.972
170					95% DL/2 (t) UCL	0.0104					95% H-Stat (DL/2) UCL	0.0084
171												
172					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
173	**MLE method failed to converge properly**										Mean in Log Scale	-5.871
174											SD in Log Scale	0.981
175											Mean in Original Scale	0.00474
176											SD in Original Scale	0.00756
177											95% Percentile Bootstrap UCL	0.00522
178											95% BCA Bootstrap UCL	0.00536
179												
180	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
181					k star (bias corrected)	1.239	**Data do not follow a Discernable Distribution (0.05)**					
182					Theta Star	0.00681						
183					nu star	579.9						
184												
185					A-D Test Statistic	8.973	**Nonparametric Statistics**					
186					5% A-D Critical Value	0.778					Kaplan-Meier (KM) Method	
187					K-S Test Statistic	0.778					Mean	0.00477
188					5% K-S Critical Value	0.0612					SD	0.00754
189	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0003015
190											95% KM (t) UCL	0.00527
191	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00527
192					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00525
193					Minimum	0.00103					95% KM (bootstrap t) UCL	0.0054
194					Maximum	0.111					95% KM (BCA) UCL	0.00535
195					Mean	0.00883					95% KM (Percentile Bootstrap) UCL	0.00527
196					Median	0.00771					95% KM (Chebyshev) UCL	0.00609
197					SD	0.00726					97.5% KM (Chebyshev) UCL	0.00666
198					k star	2.748					99% KM (Chebyshev) UCL	0.00777
199					Theta star	0.00321						
200					Nu star	3869	**Potential UCLs to Use**					
201					AppChi2	3726					95% KM (t) UCL	0.00527
202					95% Gamma Approximate UCL	0.00917					95% KM (% Bootstrap) UCL	0.00527
203					95% Adjusted Gamma UCL	0.00917						
204	**Note: DL/2 is not a recommended method.**											
205												

General UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Fluoride (background)

General Statistics

Number of Valid Data	143	Number of Detected Data	118
Number of Distinct Detected Data	108	Number of Non-Detect Data	25
		Percent Non-Detects	17.48%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.525	Minimum Detected	-0.644
Maximum Detected	4.34	Maximum Detected	1.468
Mean of Detected	1.698	Mean of Detected	0.362
SD of Detected	1.024	SD of Detected	0.577
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.126	Lilliefors Test Statistic	0.118
5% Lilliefors Critical Value	0.0816	5% Lilliefors Critical Value	0.0816
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.445	Mean	0.0562
SD	1.081	SD	0.848
95% DL/2 (t) UCL	1.594	95% H-Stat (DL/2) UCL	1.452
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.365	Mean in Log Scale	0.133
SD	1.199	SD in Log Scale	0.734
95% MLE (t) UCL	1.532	Mean in Original Scale	1.471
95% MLE (Tiku) UCL	1.532	SD in Original Scale	1.054
		95% Percentile Bootstrap UCL	1.615
		95% BCA Bootstrap UCL	1.624

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	3.07	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.553		
nu star	724.5		
A-D Test Statistic	2.267	**Nonparametric Statistics**	
5% A-D Critical Value	0.759	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.759	Mean	1.493
5% K-S Critical Value	0.0853	SD	1.028

54	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0863
55											95% KM (t) UCL	1.636
56	**Assuming Gamma Distribution**										95% KM (z) UCL	1.635
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	1.632
58	Minimum	1E-09									95% KM (bootstrap t) UCL	1.648
59	Maximum	4.34									95% KM (BCA) UCL	1.632
60	Mean	1.477									95% KM (Percentile Bootstrap) UCL	1.635
61	Median	1.14									95% KM (Chebyshev) UCL	1.869
62	SD	1.056									97.5% KM (Chebyshev) UCL	2.032
63	k star	0.579									99% KM (Chebyshev) UCL	2.352
64	Theta star	2.55										
65	Nu star	165.7									**Potential UCLs to Use**	
66	AppChi2	137									95% KM (BCA) UCL	1.632
67	95% Gamma Approximate UCL	1.788										
68	95% Adjusted Gamma UCL	1.791										
69	**Note: DL/2 is not a recommended method.**											
70												
71												
72	**Fluoride (flood)**											
73												
74	**General Statistics**											
75	Number of Valid Data	142									Number of Detected Data	98
76	Number of Distinct Detected Data	71									Number of Non-Detect Data	44
77											Percent Non-Detects	30.99%
78												
79	**Raw Statistics**										**Log-transformed Statistics**	
80	Minimum Detected	0.05									Minimum Detected	-2.996
81	Maximum Detected	8.78									Maximum Detected	2.172
82	Mean of Detected	2.251									Mean of Detected	0.595
83	SD of Detected	1.483									SD of Detected	0.746
84	Minimum Non-Detect	0.2									Minimum Non-Detect	-1.609
85	Maximum Non-Detect	13.4									Maximum Non-Detect	2.595
86												
87	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	142
88	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
89	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
90												
91	**UCL Statistics**											
92	**Normal Distribution Test with Detected Values Only**										**Lognormal Distribution Test with Detected Values Only**	
93	Lilliefors Test Statistic	0.134									Lilliefors Test Statistic	0.155
94	5% Lilliefors Critical Value	0.0895									5% Lilliefors Critical Value	0.0895
95	**Data not Normal at 5% Significance Level**										**Data not Lognormal at 5% Significance Level**	
96												
97	**Assuming Normal Distribution**										**Assuming Lognormal Distribution**	
98	DL/2 Substitution Method										DL/2 Substitution Method	
99	Mean	2.1									Mean	0.362
100	SD	1.691									SD	0.995
101	95% DL/2 (t) UCL	2.335									95% H-Stat (DL/2) UCL	2.568
102												
103	Maximum Likelihood Estimate(MLE) Method	N/A									Log ROS Method	
104	**MLE method failed to converge properly**										Mean in Log Scale	0.311
105											SD in Log Scale	0.848
106											Mean in Original Scale	1.851

107											SD in Original Scale	1.447
108											95% Percentile Bootstrap UCL	2.055
109											95% BCA Bootstrap UCL	2.086
110												
111	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
112					k star (bias corrected)	2.392	**Data do not follow a Discernable Distribution (0.05)**					
113					Theta Star	0.941						
114					nu star	468.9						
115												
116					A-D Test Statistic	1.512	**Nonparametric Statistics**					
117					5% A-D Critical Value	0.762					Kaplan-Meier (KM) Method	
118					K-S Test Statistic	0.762					Mean	1.828
119					5% K-S Critical Value	0.0913					SD	1.508
120	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.134
121											95% KM (t) UCL	2.051
122	**Assuming Gamma Distribution**										95% KM (z) UCL	2.049
123					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	2.043
124					Minimum	1E-09					95% KM (bootstrap t) UCL	2.074
125					Maximum	8.78					95% KM (BCA) UCL	2.084
126					Mean	2.06					95% KM (Percentile Bootstrap) UCL	2.056
127					Median	1.935					95% KM (Chebyshev) UCL	2.414
128					SD	1.43					97.5% KM (Chebyshev) UCL	2.668
129					k star	0.734					99% KM (Chebyshev) UCL	3.166
130					Theta star	2.807						
131					Nu star	208.4	**Potential UCLs to Use**					
132					AppChi2	176					95% KM (BCA) UCL	2.084
133					95% Gamma Approximate UCL	2.439						
134					95% Adjusted Gamma UCL	2.443						
135	**Note: DL/2 is not a recommended method.**											
136												
137												
138	**Fluoride (no flood)**											
139												
140	**General Statistics**											
141					Number of Valid Data	349					Number of Detected Data	328
142					Number of Distinct Detected Data	226					Number of Non-Detect Data	21
143											Percent Non-Detects	6.02%
144												
145	**Raw Statistics**						**Log-transformed Statistics**					
146					Minimum Detected	0.18					Minimum Detected	-1.715
147					Maximum Detected	24.6					Maximum Detected	3.203
148					Mean of Detected	2.948					Mean of Detected	0.861
149					SD of Detected	2.513					SD of Detected	0.661
150					Minimum Non-Detect	0.1					Minimum Non-Detect	-2.303
151					Maximum Non-Detect	5					Maximum Non-Detect	1.609
152												
153	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	315
154	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	34
155	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	90.26%
156												
157	**UCL Statistics**											
158	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
159					Lilliefors Test Statistic	0.178					Lilliefors Test Statistic	0.074

160				5% Lilliefors Critical Value	0.0489					5% Lilliefors Critical Value	0.0489
161	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
162												
163	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
164				DL/2 Substitution Method						DL/2 Substitution Method	
165				Mean	2.842					Mean	0.773
166				SD	2.487					SD	0.805
167				95% DL/2 (t) UCL	3.062					95% H-Stat (DL/2) UCL	3.174
168											
169				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
170	**MLE yields a negative mean**									Mean in Log Scale	0.804
171										SD in Log Scale	0.705
172										Mean in Original Scale	2.846
173										SD in Original Scale	2.483
174										95% Percentile Bootstrap UCL	3.074
175										95% BCA Bootstrap UCL	3.134
176											
177	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
178				k star (bias corrected)	2.402		**Data do not follow a Discernable Distribution (0.05)**					
179				Theta Star	1.227							
180				nu star	1576							
181												
182				A-D Test Statistic	3.847		**Nonparametric Statistics**					
183				5% A-D Critical Value	0.763					Kaplan-Meier (KM) Method	
184				K-S Test Statistic	0.763					Mean	2.837
185				5% K-S Critical Value	0.0507					SD	2.491
186	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.134
187										95% KM (t) UCL	3.057
188	**Assuming Gamma Distribution**									95% KM (z) UCL	3.057
189				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	3.057
190				Minimum	1E-09					95% KM (bootstrap t) UCL	3.093
191				Maximum	24.6					95% KM (BCA) UCL	3.056
192				Mean	2.846					95% KM (Percentile Bootstrap) UCL	3.063
193				Median	2.3					95% KM (Chebyshev) UCL	3.42
194				SD	2.502					97.5% KM (Chebyshev) UCL	3.673
195				k star	0.655					99% KM (Chebyshev) UCL	4.169
196				Theta star	4.347						
197				Nu star	457.1		**Potential UCLs to Use**					
198				AppChi2	408.5					95% KM (BCA) UCL	3.056
199				95% Gamma Approximate UCL	3.185						
200				95% Adjusted Gamma UCL	3.186						
201	**Note: DL/2 is not a recommended method.**											
202												

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Hexavalent chromium (background)											
10												
11	General Statistics											
12	Number of Valid Data			148		Number of Detected Data			110			
13	Number of Distinct Detected Data			83		Number of Non-Detect Data			38			
14						Percent Non-Detects			25.68%			
15												
16	Raw Statistics					Log-transformed Statistics						
17	Minimum Detected			0.00022		Minimum Detected			-8.422			
18	Maximum Detected			0.0376		Maximum Detected			-3.281			
19	Mean of Detected			0.0102		Mean of Detected			-5.066			
20	SD of Detected			0.00844		SD of Detected			1.182			
21	Minimum Non-Detect			0.0002		Minimum Non-Detect			-8.517			
22	Maximum Non-Detect			0.001		Maximum Non-Detect			-6.908			
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect			48			
25	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected			100			
26	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage			32.43%			
27												
28	UCL Statistics											
29	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
30	Lilliefors Test Statistic			0.148		Lilliefors Test Statistic			0.181			
31	5% Lilliefors Critical Value			0.0845		5% Lilliefors Critical Value			0.0845			
32	Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level						
33												
34	Assuming Normal Distribution					Assuming Lognormal Distribution						
35	DL/2 Substitution Method					DL/2 Substitution Method						
36	Mean			0.00761		Mean			-6.043			
37	SD			0.00848		SD			1.982			
38	95% DL/2 (t) UCL			0.00876		95% H-Stat (DL/2) UCL			0.0145			
39												
40	Maximum Likelihood Estimate(MLE) Method					Log ROS Method						
41	Mean			0.00543		Mean in Log Scale			-5.694			
42	SD			0.0112		SD in Log Scale			1.514			
43	95% MLE (t) UCL			0.00695		Mean in Original Scale			0.00773			
44	95% MLE (Tiku) UCL			0.00706		SD in Original Scale			0.00838			
45						95% Percentile Bootstrap UCL			0.00888			
46						95% BCA Bootstrap UCL			0.00902			
47												
48	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
49	k star (bias corrected)			1.158		Data do not follow a Discernable Distribution (0.05)						
50	Theta Star			0.00878								
51	nu star			254.8								
52												
53	A-D Test Statistic			1.093		Nonparametric Statistics						

54				5% A-D Critical Value	0.778					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.778					Mean		0.00762
56				5% K-S Critical Value	0.0891					SD		0.00844
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.0006973
58										95% KM (t) UCL		0.00878
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.00877
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00877
61				Minimum	1E-09					95% KM (bootstrap t) UCL		0.00889
62				Maximum	0.0376					95% KM (BCA) UCL		0.0089
63				Mean	0.00812					95% KM (Percentile Bootstrap) UCL		0.00873
64				Median	0.00564					95% KM (Chebyshev) UCL		0.0107
65				SD	0.00814					97.5% KM (Chebyshev) UCL		0.012
66				k star	0.371					99% KM (Chebyshev) UCL		0.0146
67				Theta star	0.0219							
68				Nu star	109.9					**Potential UCLs to Use**		
69				AppChi2	86.66					95% KM (Chebyshev) UCL		0.0107
70				95% Gamma Approximate UCL	0.0103							
71				95% Adjusted Gamma UCL	0.0103							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Hexavalent chromium (flood)**											
76												
77						**General Statistics**							
78				Number of Valid Data	1768					Number of Detected Data		851
79				Number of Distinct Detected Data	684					Number of Non-Detect Data		917
80										Percent Non-Detects		51.87%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.00068					Minimum Detected		-7.293
84				Maximum Detected	14.4					Maximum Detected		2.667
85				Mean of Detected	2.13					Mean of Detected		-0.917
86				SD of Detected	3.054					SD of Detected		2.442
87				Minimum Non-Detect	0.0002					Minimum Non-Detect		-8.517
88				Maximum Non-Detect	0.01					Maximum Non-Detect		-4.605
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		999
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		769
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		56.50%
93												
94						**UCL Statistics**							
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Lilliefors Test Statistic	0.243					Lilliefors Test Statistic		0.103
97				5% Lilliefors Critical Value	0.0304					5% Lilliefors Critical Value		0.0304
98				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	1.026					Mean		-4.353
103				SD	2.37					SD		3.817
104				95% DL/2 (t) UCL	1.119					95% H-Stat (DL/2) UCL		N/A
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

	A	B	C	D	E	F	G	H	I	J	K	L
107	**MLE yields a negative mean**										Mean in Log Scale	-3.945
108											SD in Log Scale	3.724
109											Mean in Original Scale	1.028
110											SD in Original Scale	2.369
111											95% Percentile Bootstrap UCL	1.126
112											95% BCA Bootstrap UCL	1.128
113												
114	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
115					k star (bias corrected)	0.394	**Data do not follow a Discernable Distribution (0.05)**					
116					Theta Star	5.412						
117					nu star	669.9						
118												
119					A-D Test Statistic	5.979	**Nonparametric Statistics**					
120					5% A-D Critical Value	0.849	Kaplan-Meier (KM) Method					
121					K-S Test Statistic	0.849					Mean	1.026
122					5% K-S Critical Value	0.0345					SD	2.37
123	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0564
124											95% KM (t) UCL	1.119
125	**Assuming Gamma Distribution**										95% KM (z) UCL	1.119
126					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	1.118
127					Minimum	0.00068					95% KM (bootstrap t) UCL	1.122
128					Maximum	14.4					95% KM (BCA) UCL	1.11
129					Mean	2.003					95% KM (Percentile Bootstrap) UCL	1.122
130					Median	1.044					95% KM (Chebyshev) UCL	1.272
131					SD	2.387					97.5% KM (Chebyshev) UCL	1.378
132					k star	0.623					99% KM (Chebyshev) UCL	1.587
133					Theta star	3.217						
134					Nu star	2202	**Potential UCLs to Use**					
135					AppChi2	2094					97.5% KM (Chebyshev) UCL	1.378
136					95% Gamma Approximate UCL	2.106						
137					95% Adjusted Gamma UCL	2.106						
138	**Note: DL/2 is not a recommended method.**											
139												
140												
141	**Hexavalent chromium (no flood)**											
142												
143						**General Statistics**							
144					Number of Valid Data	1012	Number of Detected Data					799
145					Number of Distinct Detected Data	571	Number of Non-Detect Data					213
146											Percent Non-Detects	21.05%
147												
148					**Raw Statistics**		**Log-transformed Statistics**					
149					Minimum Detected	0.00024	Minimum Detected					-8.335
150					Maximum Detected	15.7	Maximum Detected					2.754
151					Mean of Detected	1.12	Mean of Detected					-2.019
152					SD of Detected	1.79	SD of Detected					2.662
153					Minimum Non-Detect	0.0002	Minimum Non-Detect					-8.517
154					Maximum Non-Detect	0.01	Maximum Non-Detect					-4.605
155												
156	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	349
157	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	663
158	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	34.49%
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160	**UCL Statistics**											
161	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
162					Lilliefors Test Statistic	0.266					Lilliefors Test Statistic	0.136
163					5% Lilliefors Critical Value	0.0313					5% Lilliefors Critical Value	0.0313
164	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
165												
166	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
167					DL/2 Substitution Method						DL/2 Substitution Method	
168					Mean	0.884					Mean	-3.09
169					SD	1.655					SD	3.21
170					95% DL/2 (t) UCL	0.97					95% H-Stat (DL/2) UCL	N/A
171												
172					Maximum Likelihood Estimate(MLE) Method						Log ROS Method	
173					Mean	0.312					Mean in Log Scale	-3.175
174					SD	2.222					SD in Log Scale	3.341
175					95% MLE (t) UCL	0.427					Mean in Original Scale	0.884
176					95% MLE (Tiku) UCL	0.435					SD in Original Scale	1.655
177											95% Percentile Bootstrap UCL	0.97
178											95% BCA Bootstrap UCL	0.977
179												
180	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
181					k star (bias corrected)	0.32	**Data do not follow a Discernable Distribution (0.05)**					
182					Theta Star	3.503						
183					nu star	510.7						
184												
185					A-D Test Statistic	23.71	**Nonparametric Statistics**					
186					5% A-D Critical Value	0.866					Kaplan-Meier (KM) Method	
187					K-S Test Statistic	0.866					Mean	0.884
188					5% K-S Critical Value	0.0362					SD	1.654
189	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.052
190											95% KM (t) UCL	0.97
191	**Assuming Gamma Distribution**										95% KM (z) UCL	0.97
192					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.97
193					Minimum	1E-09					95% KM (bootstrap t) UCL	0.977
194					Maximum	15.7					95% KM (BCA) UCL	0.978
195					Mean	0.884					95% KM (Percentile Bootstrap) UCL	0.966
196					Median	0.0233					95% KM (Chebyshev) UCL	1.111
197					SD	1.655					97.5% KM (Chebyshev) UCL	1.209
198					k star	0.137					99% KM (Chebyshev) UCL	1.402
199					Theta star	6.473						
200					Nu star	276.5	**Potential UCLs to Use**					
201					AppChi2	239					97.5% KM (Chebyshev) UCL	1.209
202					95% Gamma Approximate UCL	1.023						
203					95% Adjusted Gamma UCL	1.023						
204	**Note: DL/2 is not a recommended method.**											
205												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Iron, dissolved (background)

General Statistics

Number of Valid Data	147	Number of Detected Data	26
Number of Distinct Detected Data	26	Number of Non-Detect Data	121
		Percent Non-Detects	82.31%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.104	Minimum Detected	-2.263
Maximum Detected	5.07	Maximum Detected	1.623
Mean of Detected	1.216	Mean of Detected	-0.457
SD of Detected	1.434	SD of Detected	1.191
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.673	Maximum Non-Detect	-0.396
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	138
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	9
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	93.88%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.739	Lilliefors Test Statistic	0.932
5% Lilliefors Critical Value	0.92	5% Lilliefors Critical Value	0.92
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.26	Mean	-2.513
SD	0.742	SD	1.101
95% DL/2 (t) UCL	0.362	95% H-Stat (DL/2) UCL	0.155
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	3.143	Mean in Log Scale	-4.367
SD	1.319	SD in Log Scale	2.633
95% MLE (t) UCL	3.323	Mean in Original Scale	0.232
95% MLE (Tiku) UCL	3.861	SD in Original Scale	0.75
		95% Percentile Bootstrap UCL	0.349
		95% BCA Bootstrap UCL	0.375
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.819	**Data appear Lognormal at 5% Significance Level**	
Theta Star	1.485		
nu star	42.57		
A-D Test Statistic	1.093	**Nonparametric Statistics**	

54				5% A-D Critical Value	0.778					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.778					Mean		0.301
56				5% K-S Critical Value	0.177					SD		0.728
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.0612
58										95% KM (t) UCL		0.402
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.402
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.399
61				Minimum	1E-09					95% KM (bootstrap t) UCL		0.441
62				Maximum	25.32					95% KM (BCA) UCL		0.428
63				Mean	9.393					95% KM (Percentile Bootstrap) UCL		0.411
64				Median	7.96					95% KM (Chebyshev) UCL		0.568
65				SD	7.925					97.5% KM (Chebyshev) UCL		0.683
66				k star	0.425					99% KM (Chebyshev) UCL		0.91
67				Theta star	22.11							
68				Nu star	124.9					**Potential UCLs to Use**		
69				AppChi2	100.1					95% KM (BCA) UCL		0.428
70				95% Gamma Approximate UCL	11.72							
71				95% Adjusted Gamma UCL	11.75							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Iron, dissolved (flood)**											
76												
77										**General Statistics**		
78				Number of Valid Data	326					Number of Detected Data		128
79				Number of Distinct Detected Data	123					Number of Non-Detect Data		198
80										Percent Non-Detects		60.74%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.0257					Minimum Detected		-3.661
84				Maximum Detected	21					Maximum Detected		3.045
85				Mean of Detected	3.126					Mean of Detected		0.268
86				SD of Detected	3.956					SD of Detected		1.583
87				Minimum Non-Detect	0.02					Minimum Non-Detect		-3.912
88				Maximum Non-Detect	2.5					Maximum Non-Detect		0.916
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		274
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		52
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		84.05%
93												
94										**UCL Statistics**		
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Lilliefors Test Statistic	0.217					Lilliefors Test Statistic		0.122
97				5% Lilliefors Critical Value	0.0783					5% Lilliefors Critical Value		0.0783
98				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	1.348					Mean		-1.083
103				SD	2.859					SD		1.692
104				95% DL/2 (t) UCL	1.61					95% H-Stat (DL/2) UCL		1.39
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	**MLE yields a negative mean**									Mean in Log Scale		-1.967
108										SD in Log Scale		2.403
109										Mean in Original Scale		1.278
110										SD in Original Scale		2.887
111										95% Percentile Bootstrap UCL		1.549
112										95% BCA Bootstrap UCL		1.585
113												
114	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
115				k star (bias corrected)		0.683				**Data appear Gamma Distributed at 5% Significance Level**		
116				Theta Star		4.577						
117				nu star		174.8						
118												
119				A-D Test Statistic		0.372				**Nonparametric Statistics**		
120				5% A-D Critical Value		0.801				Kaplan-Meier (KM) Method		
121				K-S Test Statistic		0.801				Mean		1.267
122				5% K-S Critical Value		0.0858				SD		2.888
123	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.161
124										95% KM (t) UCL		1.532
125	**Assuming Gamma Distribution**									95% KM (z) UCL		1.531
126				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		1.53
127				Minimum		0.0257				95% KM (bootstrap t) UCL		1.576
128				Maximum		21				95% KM (BCA) UCL		1.575
129				Mean		2.996				95% KM (Percentile Bootstrap) UCL		1.532
130				Median		2.831				95% KM (Chebyshev) UCL		1.967
131				SD		2.568				97.5% KM (Chebyshev) UCL		2.27
132				k star		1.456				99% KM (Chebyshev) UCL		2.865
133				Theta star		2.058						
134				Nu star		949.1				**Potential UCLs to Use**		
135				AppChi2		878.6				95% KM (t) UCL		1.532
136				95% Gamma Approximate UCL		3.236						
137				95% Adjusted Gamma UCL		3.237						
138	**Note: DL/2 is not a recommended method.**											
139												
140												
141	**Iron, dissolved (no flood)**											
142												
143							**General Statistics**					
144				Number of Valid Data		358				Number of Detected Data		24
145				Number of Distinct Detected Data		24				Number of Non-Detect Data		334
146										Percent Non-Detects		93.30%
147												
148	**Raw Statistics**									**Log-transformed Statistics**		
149				Minimum Detected		0.0245				Minimum Detected		-3.709
150				Maximum Detected		3.98				Maximum Detected		1.381
151				Mean of Detected		0.475				Mean of Detected		-1.778
152				SD of Detected		0.927				SD of Detected		1.323
153				Minimum Non-Detect		0.02				Minimum Non-Detect		-3.912
154				Maximum Non-Detect		2.5				Maximum Non-Detect		0.916
155												
156	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		356
157	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		2
158	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		99.44%
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160	**UCL Statistics**											
161	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
162					Lilliefors Test Statistic	0.516					Lilliefors Test Statistic	0.926
163					5% Lilliefors Critical Value	0.916					5% Lilliefors Critical Value	0.916
164	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
165												
166	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
167					DL/2 Substitution Method						DL/2 Substitution Method	
168					Mean	0.169					Mean	-2.182
169					SD	0.268					SD	0.951
170					95% DL/2 (t) UCL	0.193					95% H-Stat (DL/2) UCL	0.201
171												
172					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
173	**MLE method failed to converge properly**										Mean in Log Scale	-4.908
174											SD in Log Scale	1.937
175											Mean in Original Scale	0.0536
176											SD in Original Scale	0.265
177											95% Percentile Bootstrap UCL	0.0791
178											95% BCA Bootstrap UCL	0.0915
179												
180	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
181					k star (bias corrected)	0.551	**Data appear Lognormal at 5% Significance Level**					
182					Theta Star	0.863						
183					nu star	26.44						
184												
185					A-D Test Statistic	1.96	**Nonparametric Statistics**					
186					5% A-D Critical Value	0.797					Kaplan-Meier (KM) Method	
187					K-S Test Statistic	0.797					Mean	0.0666
188					5% K-S Critical Value	0.187					SD	0.261
189	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0145
190											95% KM (t) UCL	0.0905
191	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0904
192					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0862
193					Minimum	0.0245					95% KM (bootstrap t) UCL	0.112
194					Maximum	3.98					95% KM (BCA) UCL	0.108
195					Mean	0.723					95% KM (Percentile Bootstrap) UCL	0.0971
196					Median	0.576					95% KM (Chebyshev) UCL	0.13
197					SD	0.564					97.5% KM (Chebyshev) UCL	0.157
198					k star	1.546					99% KM (Chebyshev) UCL	0.211
199					Theta star	0.468						
200					Nu star	1107	**Potential UCLs to Use**					
201					AppChi2	1031					95% KM (BCA) UCL	0.108
202					95% Gamma Approximate UCL	0.777						
203					95% Adjusted Gamma UCL	0.777						
204	**Note: DL/2 is not a recommended method.**											
205												

General UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Lead, dissolved (background)

General Statistics

Number of Valid Data	147	Number of Detected Data	22
Number of Distinct Detected Data	22	Number of Non-Detect Data	125
		Percent Non-Detects	85.03%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.00102	Minimum Detected	-6.888
Maximum Detected	0.00409	Maximum Detected	-5.499
Mean of Detected	0.00199	Mean of Detected	-6.31
SD of Detected	0.0009179	SD of Detected	0.418
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.85	Lilliefors Test Statistic	0.938
5% Lilliefors Critical Value	0.911	5% Lilliefors Critical Value	0.911
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0007224	Mean	-7.408
SD	0.0006357	SD	0.488
95% DL/2 (t) UCL	0.0008092	95% H-Stat (DL/2) UCL	0.0006781
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-7.936
		SD in Log Scale	1.04
		Mean in Original Scale	0.0006036
		SD in Original Scale	0.0007182
		95% Percentile Bootstrap UCL	0.0007032
		95% BCA Bootstrap UCL	0.0007067

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	5.052	**Data appear Gamma Distributed at 5% Significance Level**	
Theta Star	0.0003931		
nu star	222.3		
A-D Test Statistic	0.641	**Nonparametric Statistics**	
5% A-D Critical Value	0.746	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.746	Mean	0.00116
5% K-S Critical Value	0.186	SD	0.000489

54	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	4.128E-05
55											95% KM (t) UCL	0.00123
56	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00123
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00122
58	Minimum	0.0002184									95% KM (bootstrap t) UCL	0.00125
59	Maximum	0.00563									95% KM (BCA) UCL	0.0014
60	Mean	0.00378									95% KM (Percentile Bootstrap) UCL	0.0013
61	Median	0.00409									95% KM (Chebyshev) UCL	0.00134
62	SD	0.00141									97.5% KM (Chebyshev) UCL	0.00142
63	k star	4.843									99% KM (Chebyshev) UCL	0.00158
64	Theta star	0.0007805										
65	Nu star	1424									**Potential UCLs to Use**	
66	AppChi2	1337									95% KM (t) UCL	0.00123
67	95% Gamma Approximate UCL	0.00402										
68	95% Adjusted Gamma UCL	0.00403										
69	**Note: DL/2 is not a recommended method.**											
70												
71												
72	**Lead, dissolved (flood)**											
73												
74	**General Statistics**											
75	Number of Valid Data	114									Number of Detected Data	21
76	Number of Distinct Detected Data	21									Number of Non-Detect Data	93
77											Percent Non-Detects	81.58%
78												
79	**Raw Statistics**							**Log-transformed Statistics**				
80	Minimum Detected	0.00094						Minimum Detected				-6.97
81	Maximum Detected	0.076						Maximum Detected				-2.577
82	Mean of Detected	0.0192						Mean of Detected				-4.822
83	SD of Detected	0.0246						SD of Detected				1.429
84	Minimum Non-Detect	0.001						Minimum Non-Detect				-6.908
85	Maximum Non-Detect	0.1						Maximum Non-Detect				-2.303
86												
87	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect				114
88	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected				0
89	Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage				100.00%
90												
91	**UCL Statistics**											
92	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
93	Lilliefors Test Statistic	0.735						Lilliefors Test Statistic				0.933
94	5% Lilliefors Critical Value	0.908						5% Lilliefors Critical Value				0.908
95	**Data not Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
96												
97	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
98	DL/2 Substitution Method							DL/2 Substitution Method				
99	Mean	0.005						Mean				-6.533
100	SD	0.0132						SD				1.254
101	95% DL/2 (t) UCL	0.00706						95% H-Stat (DL/2) UCL				0.00332
102												
103	Maximum Likelihood Estimate(MLE) Method	N/A						Log ROS Method				
104	**MLE method failed to converge properly**							Mean in Log Scale				-7.834
105								SD in Log Scale				2.139
106								Mean in Original Scale				0.00399

107											SD in Original Scale	0.0127
108											95% Percentile Bootstrap UCL	0.00618
109											95% BCA Bootstrap UCL	0.00662
110												
111	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
112					k star (bias corrected)	0.627	**Data appear Gamma Distributed at 5% Significance Level**					
113					Theta Star	0.0307						
114					nu star	26.35						
115												
116					A-D Test Statistic	0.77	**Nonparametric Statistics**					
117					5% A-D Critical Value	0.788					Kaplan-Meier (KM) Method	
118					K-S Test Statistic	0.788					Mean	0.0044
119					5% K-S Critical Value	0.198					SD	0.0125
120	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.00121
121											95% KM (t) UCL	0.00641
122	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00639
123					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00613
124					Minimum	1E-09					95% KM (bootstrap t) UCL	0.00727
125					Maximum	0.21					95% KM (BCA) UCL	0.00695
126					Mean	0.0625					95% KM (Percentile Bootstrap) UCL	0.00664
127					Median	0.0483					95% KM (Chebyshev) UCL	0.00968
128					SD	0.0566					97.5% KM (Chebyshev) UCL	0.012
129					k star	0.456					99% KM (Chebyshev) UCL	0.0164
130					Theta star	0.137						
131					Nu star	103.9	**Potential UCLs to Use**					
132					AppChi2	81.37					95% KM (t) UCL	0.00641
133					95% Gamma Approximate UCL	0.0798						
134					95% Adjusted Gamma UCL	0.08						
135	**Note: DL/2 is not a recommended method.**											
136												
137												
138	**Lead, dissolved (no flood)**											
139												
140	**General Statistics**											
141					Number of Valid Data	360					Number of Detected Data	41
142					Number of Distinct Detected Data	34					Number of Non-Detect Data	319
143											Percent Non-Detects	88.61%
144												
145	**Raw Statistics**						**Log-transformed Statistics**					
146					Minimum Detected	0.00083					Minimum Detected	-7.094
147					Maximum Detected	0.0102					Maximum Detected	-4.585
148					Mean of Detected	0.00356					Mean of Detected	-5.823
149					SD of Detected	0.00216					SD of Detected	0.636
150					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
151					Maximum Non-Detect	0.0208					Maximum Non-Detect	-3.873
152												
153	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	360
154	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	0
155	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	100.00%
156												
157	**UCL Statistics**											
158	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
159					Lilliefors Test Statistic	0.917					Lilliefors Test Statistic	0.968

160					5% Lilliefors Critical Value	0.941					5% Lilliefors Critical Value	0.941
161	**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
162												
163	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
164					DL/2 Substitution Method						DL/2 Substitution Method	
165					Mean	0.00148					Mean	-6.782
166					SD	0.00133					SD	0.689
167					95% DL/2 (t) UCL	0.00159					95% H-Stat (DL/2) UCL	0.00147
168												
169					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
170	**MLE method failed to converge properly**										Mean in Log Scale	-7.576
171											SD in Log Scale	1.078
172											Mean in Original Scale	0.0009269
173											SD in Original Scale	0.00128
174											95% Percentile Bootstrap UCL	0.00104
175											95% BCA Bootstrap UCL	0.00105
176												
177	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
178					k star (bias corrected)	2.65	**Data appear Gamma Distributed at 5% Significance Level**					
179					Theta Star	0.00135						
180					nu star	217.3						
181												
182					A-D Test Statistic	0.341	**Nonparametric Statistics**					
183					5% A-D Critical Value	0.756					Kaplan-Meier (KM) Method	
184					K-S Test Statistic	0.756					Mean	0.0012
185					5% K-S Critical Value	0.139					SD	0.00116
186	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	6.512E-05
187											95% KM (t) UCL	0.00131
188	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00131
189					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00132
190					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0013
191					Maximum	0.0102					95% KM (BCA) UCL	0.00157
192					Mean	0.00597					95% KM (Percentile Bootstrap) UCL	0.00149
193					Median	0.00635					95% KM (Chebyshev) UCL	0.00149
194					SD	0.00254					97.5% KM (Chebyshev) UCL	0.00161
195					k star	2.315					99% KM (Chebyshev) UCL	0.00185
196					Theta star	0.00258						
197					Nu star	1667	**Potential UCLs to Use**					
198					AppChi2	1573					95% KM (t) UCL	0.00131
199					95% Gamma Approximate UCL	0.00632						
200					95% Adjusted Gamma UCL	0.00632						
201	**Note: DL/2 is not a recommended method.**											
202												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Mercury, dissolved (flood)

General Statistics

Number of Valid Data	82	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	81
		Percent Non-Detects	98.78%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mercury, dissolved (flood) was not processed!

Mercury, dissolved (no flood)

General Statistics

Number of Valid Data	298	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	298
		Percent Non-Detects	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mercury, dissolved (no flood) was not processed!

General UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Molybdenum, dissolved (background)

General Statistics

Number of Valid Data	149	Number of Detected Data	148
Number of Distinct Detected Data	131	Number of Non-Detect Data	1
		Percent Non-Detects	0.67%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0035	Minimum Detected	-5.655
Maximum Detected	0.0417	Maximum Detected	-3.177
Mean of Detected	0.0113	Mean of Detected	-4.665
SD of Detected	0.00752	SD of Detected	0.579
Minimum Non-Detect	0.00758	Minimum Non-Detect	-4.882
Maximum Non-Detect	0.00758	Maximum Non-Detect	-4.882

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.172	Lilliefors Test Statistic	0.117
5% Lilliefors Critical Value	0.0728	5% Lilliefors Critical Value	0.0728
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0112	Mean	-4.671
SD	0.00752	SD	0.582
95% DL/2 (t) UCL	0.0122	95% H-Stat (DL/2) UCL	0.0122
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00831	Mean in Log Scale	-4.668
SD	0.0108	SD in Log Scale	0.579
95% MLE (t) UCL	0.00977	Mean in Original Scale	0.0112
95% MLE (Tiku) UCL	0.01	SD in Original Scale	0.00751
		95% Percentile Bootstrap UCL	0.0122
		95% BCA Bootstrap UCL	0.0124

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.908	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.00387		
nu star	860.7		
A-D Test Statistic	3.091	**Nonparametric Statistics**	
5% A-D Critical Value	0.76	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.76	Mean	0.0112
5% K-S Critical Value	0.0776	SD	0.00748

54	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0006152
55											95% KM (t) UCL	0.0122
56	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0122
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.0122
58	Minimum	0.0035									95% KM (bootstrap t) UCL	0.0124
59	Maximum	0.0417									95% KM (BCA) UCL	0.0123
60	Mean	0.0112									95% KM (Percentile Bootstrap) UCL	0.0122
61	Median	0.00858									95% KM (Chebyshev) UCL	0.0139
62	SD	0.0075									97.5% KM (Chebyshev) UCL	0.0151
63	k star	2.916									99% KM (Chebyshev) UCL	0.0173
64	Theta star	0.00385										
65	Nu star	868.8									**Potential UCLs to Use**	
66	AppChi2	801.4									95% KM (BCA) UCL	0.0123
67	95% Gamma Approximate UCL	0.0122										
68	95% Adjusted Gamma UCL	0.0122										
69	**Note: DL/2 is not a recommended method.**											
70												
71												
72	**Molybdenum, dissolved (flood)**											
73												
74	**General Statistics**											
75	Number of Valid Data	115									Number of Detected Data	106
76	Number of Distinct Detected Data	92									Number of Non-Detect Data	9
77											Percent Non-Detects	7.83%
78												
79	**Raw Statistics**							**Log-transformed Statistics**				
80	Minimum Detected	0.00085						Minimum Detected				-7.07
81	Maximum Detected	0.196						Maximum Detected				-1.63
82	Mean of Detected	0.0274						Mean of Detected				-3.904
83	SD of Detected	0.0264						SD of Detected				0.788
84	Minimum Non-Detect	0.002						Minimum Non-Detect				-6.215
85	Maximum Non-Detect	0.02						Maximum Non-Detect				-3.912
86												
87	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect				62
88	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected				53
89	Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage				53.91%
90												
91	**UCL Statistics**											
92	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
93	Lilliefors Test Statistic	0.193						Lilliefors Test Statistic				0.0537
94	5% Lilliefors Critical Value	0.0861						5% Lilliefors Critical Value				0.0861
95	**Data not Normal at 5% Significance Level**							**Data appear Lognormal at 5% Significance Level**				
96												
97	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
98	DL/2 Substitution Method							DL/2 Substitution Method				
99	Mean	0.0255						Mean				-4.063
100	SD	0.0262						SD				0.948
101	95% DL/2 (t) UCL	0.0296						95% H-Stat (DL/2) UCL				0.0297
102												
103	Maximum Likelihood Estimate(MLE) Method							Log ROS Method				
104	Mean	0.0115						Mean in Log Scale				-4.03
105	SD	0.0401						SD in Log Scale				0.881
106	95% MLE (t) UCL	0.0177						Mean in Original Scale				0.0256

107				95% MLE (Tiku) UCL	0.0196					SD in Original Scale	0.0261
108										95% Percentile Bootstrap UCL	0.03
109										95% BCA Bootstrap UCL	0.0305
110											
111	**Gamma Distribution Test with Detected Values Only**							**Data Distribution Test with Detected Values Only**			
112				k star (bias corrected)	1.732			**Data appear Lognormal at 5% Significance Level**			
113				Theta Star	0.0158						
114				nu star	367.1						
115											
116				A-D Test Statistic	1.504			**Nonparametric Statistics**			
117				5% A-D Critical Value	0.767			Kaplan-Meier (KM) Method			
118				K-S Test Statistic	0.767			Mean	0.0254		
119				5% K-S Critical Value	0.0893			SD	0.0262		
120	**Data not Gamma Distributed at 5% Significance Level**							SE of Mean	0.00245		
121								95% KM (t) UCL	0.0295		
122	**Assuming Gamma Distribution**							95% KM (z) UCL	0.0295		
123				Gamma ROS Statistics using Extrapolated Data				95% KM (jackknife) UCL	0.0293		
124				Minimum	1E-09			95% KM (bootstrap t) UCL	0.0306		
125				Maximum	0.196			95% KM (BCA) UCL	0.03		
126				Mean	0.0254			95% KM (Percentile Bootstrap) UCL	0.0298		
127				Median	0.0179			95% KM (Chebyshev) UCL	0.0361		
128				SD	0.0263			97.5% KM (Chebyshev) UCL	0.0407		
129				k star	0.453			99% KM (Chebyshev) UCL	0.0498		
130				Theta star	0.0562						
131				Nu star	104.1			**Potential UCLs to Use**			
132				AppChi2	81.56			95% KM (BCA) UCL	0.03		
133				95% Gamma Approximate UCL	0.0324						
134				95% Adjusted Gamma UCL	0.0326						
135	**Note: DL/2 is not a recommended method.**										
136											
137											
138	**Molybdenum, dissolved (no flood)**										
139											
140	**General Statistics**										
141				Number of Valid Data	448			Number of Detected Data	422		
142				Number of Distinct Detected Data	279			Number of Non-Detect Data	26		
143								Percent Non-Detects	5.80%		
144											
145	**Raw Statistics**							**Log-transformed Statistics**			
146				Minimum Detected	0.0014			Minimum Detected	-6.571		
147				Maximum Detected	0.301			Maximum Detected	-1.201		
148				Mean of Detected	0.0317			Mean of Detected	-3.768		
149				SD of Detected	0.031			SD of Detected	0.788		
150				Minimum Non-Detect	0.002			Minimum Non-Detect	-6.215		
151				Maximum Non-Detect	0.05			Maximum Non-Detect	-2.996		
152											
153	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect	382		
154	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected	66		
155	Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	85.27%		
156											
157	**UCL Statistics**										
158	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**			
159				Lilliefors Test Statistic	0.179			Lilliefors Test Statistic	0.0274		

5% Lilliefors Critical Value	0.0431	
Data not Normal at 5% Significance Level		
Assuming Normal Distribution		
DL/2 Substitution Method		
Mean	0.0303	
SD	0.0307	
95% DL/2 (t) UCL	0.0327	
Maximum Likelihood Estimate(MLE) Method	N/A	
MLE yields a negative mean		
Gamma Distribution Test with Detected Values Only		
k star (bias corrected)	1.722	
Theta Star	0.0184	
nu star	1454	
A-D Test Statistic	3.496	
5% A-D Critical Value	0.77	
K-S Test Statistic	0.77	
5% K-S Critical Value	0.0448	
Data not Gamma Distributed at 5% Significance Level		
Assuming Gamma Distribution		
Gamma ROS Statistics using Extrapolated Data		
Minimum	1E-09	
Maximum	0.301	
Mean	0.0303	
Median	0.0217	
SD	0.0308	
k star	0.638	
Theta star	0.0476	
Nu star	571.2	
AppChi2	516.8	
95% Gamma Approximate UCL	0.0335	
95% Adjusted Gamma UCL	0.0335	
Note: DL/2 is not a recommended method.		

5% Lilliefors Critical Value	0.0431	
Data appear Lognormal at 5% Significance Level		
Assuming Lognormal Distribution		
DL/2 Substitution Method		
Mean	-3.863	
SD	0.896	
95% H-Stat (DL/2) UCL	0.0332	
Log ROS Method		
Mean in Log Scale	-3.845	
SD in Log Scale	0.845	
Mean in Original Scale	0.0303	
SD in Original Scale	0.0307	
95% Percentile Bootstrap UCL	0.0329	
95% BCA Bootstrap UCL	0.0329	
Data Distribution Test with Detected Values Only		
Data appear Lognormal at 5% Significance Level		
Nonparametric Statistics		
Kaplan-Meier (KM) Method		
Mean	0.0303	
SD	0.0307	
SE of Mean	0.00145	
95% KM (t) UCL	0.0327	
95% KM (z) UCL	0.0327	
95% KM (jackknife) UCL	0.0327	
95% KM (bootstrap t) UCL	0.033	
95% KM (BCA) UCL	0.0327	
95% KM (Percentile Bootstrap) UCL	0.0328	
95% KM (Chebyshev) UCL	0.0366	
97.5% KM (Chebyshev) UCL	0.0394	
99% KM (Chebyshev) UCL	0.0448	
Potential UCLs to Use		
95% KM (BCA) UCL	0.0327	

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Nickel, dissolved (background)											
10												
11	General Statistics											
12	Number of Valid Data			149		Number of Detected Data					53	
13	Number of Distinct Detected Data			50		Number of Non-Detect Data					96	
14						Percent Non-Detects					64.43%	
15												
16	Raw Statistics					Log-transformed Statistics						
17	Minimum Detected			0.001		Minimum Detected					-6.908	
18	Maximum Detected			0.0415		Maximum Detected					-3.182	
19	Mean of Detected			0.0042		Mean of Detected					-5.965	
20	SD of Detected			0.00635		SD of Detected					0.873	
21	Minimum Non-Detect			0.001		Minimum Non-Detect					-6.908	
22	Maximum Non-Detect			0.00628		Maximum Non-Detect					-5.07	
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect					138	
25	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected					11	
26	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage					92.62%	
27												
28	UCL Statistics											
29	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
30	Lilliefors Test Statistic			0.307		Lilliefors Test Statistic					0.142	
31	5% Lilliefors Critical Value			0.122		5% Lilliefors Critical Value					0.122	
32	Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level						
33												
34	Assuming Normal Distribution					Assuming Lognormal Distribution						
35	DL/2 Substitution Method					DL/2 Substitution Method						
36	Mean			0.00184		Mean					-7	
37	SD			0.00416		SD					0.943	
38	95% DL/2 (t) UCL			0.0024		95% H-Stat (DL/2) UCL					0.00136	
39												
40	Maximum Likelihood Estimate(MLE) Method			N/A		Log ROS Method						
41	MLE yields a negative mean					Mean in Log Scale					-7.675	
42						SD in Log Scale					1.618	
43						Mean in Original Scale					0.00167	
44						SD in Original Scale					0.00422	
45						95% Percentile Bootstrap UCL					0.00229	
46						95% BCA Bootstrap UCL					0.00253	
47												
48	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
49	k star (bias corrected)			1.1		Data do not follow a Discernable Distribution (0.05)						
50	Theta Star			0.00382								
51	nu star			116.6								
52												
53	A-D Test Statistic			3.641		Nonparametric Statistics						

54				5% A-D Critical Value	0.776					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.776					Mean		0.00214
56				5% K-S Critical Value	0.125					SD		0.00405
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.0003354
58										95% KM (t) UCL		0.0027
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.00269
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00268
61				Minimum	1E-09					95% KM (bootstrap t) UCL		0.00317
62				Maximum	0.0415					95% KM (BCA) UCL		0.00278
63				Mean	0.00744					95% KM (Percentile Bootstrap) UCL		0.00276
64				Median	0.00579					95% KM (Chebyshev) UCL		0.0036
65				SD	0.00668					97.5% KM (Chebyshev) UCL		0.00424
66				k star	0.453					99% KM (Chebyshev) UCL		0.00548
67				Theta star	0.0164							
68				Nu star	135.1					**Potential UCLs to Use**		
69				AppChi2	109.3					95% KM (t) UCL		0.0027
70				95% Gamma Approximate UCL	0.0092					95% KM (% Bootstrap) UCL		0.00276
71				95% Adjusted Gamma UCL	0.00922							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Nickel, dissolved (flood)**											
76												
77										**General Statistics**		
78				Number of Valid Data	345					Number of Detected Data		160
79				Number of Distinct Detected Data	108					Number of Non-Detect Data		185
80										Percent Non-Detects		53.62%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.00079					Minimum Detected		-7.143
84				Maximum Detected	0.5					Maximum Detected		-0.693
85				Mean of Detected	0.0217					Mean of Detected		-4.991
86				SD of Detected	0.0636					SD of Detected		1.286
87				Minimum Non-Detect	0.001					Minimum Non-Detect		-6.908
88				Maximum Non-Detect	0.4					Maximum Non-Detect		-0.916
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		343
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		2
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		99.42%
93												
94										**UCL Statistics**		
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Lilliefors Test Statistic	0.371					Lilliefors Test Statistic		0.134
97				5% Lilliefors Critical Value	0.07					5% Lilliefors Critical Value		0.07
98				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	0.0162					Mean		-4.971
103				SD	0.046					SD		1.198
104				95% DL/2 (t) UCL	0.0202					95% H-Stat (DL/2) UCL		0.0181
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	**MLE method failed to converge properly**									Mean in Log Scale		-5.608
108										SD in Log Scale		1.381
109										Mean in Original Scale		0.0123
110										SD in Original Scale		0.0442
111										95% Percentile Bootstrap UCL		0.0165
112										95% BCA Bootstrap UCL		0.0182
113												
114	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
115				k star (bias corrected)		0.536				**Data do not follow a Discernable Distribution (0.05)**		
116				Theta Star		0.0404						
117				nu star		171.4						
118												
119				A-D Test Statistic		12.31				**Nonparametric Statistics**		
120				5% A-D Critical Value		0.816				Kaplan-Meier (KM) Method		
121				K-S Test Statistic		0.816				Mean		0.0123
122				5% K-S Critical Value		0.078				SD		0.0442
123	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.0024
124										95% KM (t) UCL		0.0163
125	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0163
126				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0162
127				Minimum		1E-09				95% KM (bootstrap t) UCL		0.0193
128				Maximum		0.5				95% KM (BCA) UCL		0.0167
129				Mean		0.0226				95% KM (Percentile Bootstrap) UCL		0.0166
130				Median		0.0051				95% KM (Chebyshev) UCL		0.0228
131				SD		0.0487				97.5% KM (Chebyshev) UCL		0.0273
132				k star		0.171				99% KM (Chebyshev) UCL		0.0362
133				Theta star		0.133						
134				Nu star		117.7				**Potential UCLs to Use**		
135				AppChi2		93.67				95% KM (BCA) UCL		0.0167
136				95% Gamma Approximate UCL		0.0284						
137				95% Adjusted Gamma UCL		0.0285						
138	**Note: DL/2 is not a recommended method.**											
139												
140												
141	**Nickel, dissolved (no flood)**											
142												
143							**General Statistics**					
144				Number of Valid Data		704				Number of Detected Data		319
145				Number of Distinct Detected Data		169				Number of Non-Detect Data		385
146										Percent Non-Detects		54.69%
147												
148	**Raw Statistics**									**Log-transformed Statistics**		
149				Minimum Detected		0.00069				Minimum Detected		-7.279
150				Maximum Detected		0.168				Maximum Detected		-1.784
151				Mean of Detected		0.00894				Mean of Detected		-5.283
152				SD of Detected		0.0151				SD of Detected		0.996
153				Minimum Non-Detect		0.001				Minimum Non-Detect		-6.908
154				Maximum Non-Detect		0.4				Maximum Non-Detect		-0.916
155												
156	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		704
157	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
158	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160	**UCL Statistics**											
161	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
162					Lilliefors Test Statistic	0.295					Lilliefors Test Statistic	0.0615
163					5% Lilliefors Critical Value	0.0496					5% Lilliefors Critical Value	0.0496
164	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
165												
166	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
167					DL/2 Substitution Method						DL/2 Substitution Method	
168					Mean	0.00978					Mean	-5.151
169					SD	0.0179					SD	1.031
170					95% DL/2 (t) UCL	0.0109					95% H-Stat (DL/2) UCL	0.0126
171												
172					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
173	**MLE method failed to converge properly**										Mean in Log Scale	-5.709
174											SD in Log Scale	1.07
175											Mean in Original Scale	0.00608
176											SD in Original Scale	0.0109
177											95% Percentile Bootstrap UCL	0.00682
178											95% BCA Bootstrap UCL	0.00696
179												
180	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
181					k star (bias corrected)	1.011	**Data do not follow a Discernable Distribution (0.05)**					
182					Theta Star	0.00884						
183					nu star	645.1						
184												
185					A-D Test Statistic	8.013	**Nonparametric Statistics**					
186					5% A-D Critical Value	0.784					Kaplan-Meier (KM) Method	
187					K-S Test Statistic	0.784					Mean	0.00616
188					5% K-S Critical Value	0.0523					SD	0.0109
189	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0004355
190											95% KM (t) UCL	0.00688
191	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00688
192					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00688
193					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0071
194					Maximum	0.168					95% KM (BCA) UCL	0.00691
195					Mean	0.00968					95% KM (Percentile Bootstrap) UCL	0.00696
196					Median	0.0063					95% KM (Chebyshev) UCL	0.00806
197					SD	0.0121					97.5% KM (Chebyshev) UCL	0.00888
198					k star	0.322					99% KM (Chebyshev) UCL	0.0105
199					Theta star	0.03						
200					Nu star	453.9	**Potential UCLs to Use**					
201					AppChi2	405.5					95% KM (t) UCL	0.00688
202					95% Gamma Approximate UCL	0.0108					95% KM (% Bootstrap) UCL	0.00696
203					95% Adjusted Gamma UCL	0.0108						
204	**Note: DL/2 is not a recommended method.**											
205												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Nitrate as Nitrogen (background)

General Statistics

Number of Valid Data	148	Number of Detected Data	118
Number of Distinct Detected Data	92	Number of Non-Detect Data	30
		Percent Non-Detects	20.27%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.687	Minimum Detected	-0.375
Maximum Detected	4.75	Maximum Detected	1.558
Mean of Detected	2.587	Mean of Detected	0.871
SD of Detected	0.984	SD of Detected	0.416
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	30
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	118
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	20.27%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.162	Lilliefors Test Statistic	0.103
5% Lilliefors Critical Value	0.0816	5% Lilliefors Critical Value	0.0816
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.11	Mean	0.392
SD	1.292	SD	1.04
95% DL/2 (t) UCL	2.286	95% H-Stat (DL/2) UCL	2.336
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	2.008	Mean in Log Scale	0.689
SD	1.472	SD in Log Scale	0.527
95% MLE (t) UCL	2.209	Mean in Original Scale	2.264
95% MLE (Tiku) UCL	2.219	SD in Original Scale	1.091
		95% Percentile Bootstrap UCL	2.409
		95% BCA Bootstrap UCL	2.42
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	6.328	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.409		
nu star	1494		
A-D Test Statistic	1.637	**Nonparametric Statistics**	

54				5% A-D Critical Value	0.754					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.754					Mean		2.201
56				5% K-S Critical Value	0.0849					SD		1.161
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.0958
58										95% KM (t) UCL		2.36
59				**Assuming Gamma Distribution**						95% KM (z) UCL		2.359
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		2.36
61				Minimum	1E-09					95% KM (bootstrap t) UCL		2.366
62				Maximum	4.75					95% KM (BCA) UCL		2.367
63				Mean	2.333					95% KM (Percentile Bootstrap) UCL		2.362
64				Median	1.955					95% KM (Chebyshev) UCL		2.619
65				SD	1.044					97.5% KM (Chebyshev) UCL		2.8
66				k star	2.088					99% KM (Chebyshev) UCL		3.155
67				Theta star	1.118							
68				Nu star	618					**Potential UCLs to Use**		
69				AppChi2	561.3					95% KM (BCA) UCL		2.367
70				95% Gamma Approximate UCL	2.569							
71				95% Adjusted Gamma UCL	2.571							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Nitrate as Nitrogen (flood)**											
76												
77										**General Statistics**		
78				Number of Valid Data	439					Number of Detected Data		190
79				Number of Distinct Detected Data	166					Number of Non-Detect Data		249
80										Percent Non-Detects		56.72%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.112					Minimum Detected		-2.189
84				Maximum Detected	25.1					Maximum Detected		3.223
85				Mean of Detected	4.941					Mean of Detected		1.05
86				SD of Detected	4.585					SD of Detected		1.196
87				Minimum Non-Detect	0.1					Minimum Non-Detect		-2.303
88				Maximum Non-Detect	200					Maximum Non-Detect		5.298
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		439
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
93												
94										**UCL Statistics**		
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Lilliefors Test Statistic	0.148					Lilliefors Test Statistic		0.0951
97				5% Lilliefors Critical Value	0.0643					5% Lilliefors Critical Value		0.0643
98				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	2.615					Mean		-0.209
103				SD	5.999					SD		1.48
104				95% DL/2 (t) UCL	3.087					95% H-Stat (DL/2) UCL		1.964
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	**MLE method failed to converge properly**									Mean in Log Scale		-0.454
108										SD in Log Scale		1.739
109										Mean in Original Scale		2.32
110										SD in Original Scale		3.791
111										95% Percentile Bootstrap UCL		2.635
112										95% BCA Bootstrap UCL		2.641
113												
114	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
115				k star (bias corrected)	1.035					**Data do not follow a Discernable Distribution (0.05)**		
116				Theta Star	4.775							
117				nu star	393.2							
118												
119				A-D Test Statistic	1.852					**Nonparametric Statistics**		
120				5% A-D Critical Value	0.783					Kaplan-Meier (KM) Method		
121				K-S Test Statistic	0.783					Mean		2.274
122				5% K-S Critical Value	0.0681					SD		3.824
123	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.184
124										95% KM (t) UCL		2.577
125	**Assuming Gamma Distribution**									95% KM (z) UCL		2.576
126				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		2.575
127				Minimum	0.0955					95% KM (bootstrap t) UCL		2.595
128				Maximum	25.1					95% KM (BCA) UCL		2.577
129				Mean	5.058					95% KM (Percentile Bootstrap) UCL		2.568
130				Median	4.558					95% KM (Chebyshev) UCL		3.075
131				SD	3.719					97.5% KM (Chebyshev) UCL		3.422
132				k star	1.438					99% KM (Chebyshev) UCL		4.103
133				Theta star	3.517							
134				Nu star	1263					**Potential UCLs to Use**		
135				AppChi2	1181					95% KM (BCA) UCL		2.577
136				95% Gamma Approximate UCL	5.407							
137				95% Adjusted Gamma UCL	5.408							
138	**Note: DL/2 is not a recommended method.**											
139												
140												
141	**Nitrate as Nitrogen (no flood)**											
142												
143							**General Statistics**					
144				Number of Valid Data	405					Number of Detected Data		383
145				Number of Distinct Detected Data	321					Number of Non-Detect Data		22
146										Percent Non-Detects		5.43%
147												
148	**Raw Statistics**									**Log-transformed Statistics**		
149				Minimum Detected	0.107					Minimum Detected		-2.235
150				Maximum Detected	31.8					Maximum Detected		3.459
151				Mean of Detected	4.314					Mean of Detected		0.967
152				SD of Detected	4.868					SD of Detected		1.039
153				Minimum Non-Detect	0.1					Minimum Non-Detect		-2.303
154				Maximum Non-Detect	4					Maximum Non-Detect		1.386
155												
156	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		278
157	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		127
158	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		68.64%
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160	**UCL Statistics**											
161	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
162					Lilliefors Test Statistic	0.224					Lilliefors Test Statistic	0.0766
163					5% Lilliefors Critical Value	0.0453					5% Lilliefors Critical Value	0.0453
164	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
165												
166	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
167					DL/2 Substitution Method						DL/2 Substitution Method	
168					Mean	4.099					Mean	0.841
169					SD	4.819					SD	1.151
170					95% DL/2 (t) UCL	4.494					95% H-Stat (DL/2) UCL	4.806
171												
172					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
173	**MLE yields a negative mean**										Mean in Log Scale	0.86
174											SD in Log Scale	1.113
175											Mean in Original Scale	4.104
176											SD in Original Scale	4.815
177											95% Percentile Bootstrap UCL	4.504
178											95% BCA Bootstrap UCL	4.531
179												
180	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
181					k star (bias corrected)	1.14	**Data do not follow a Discernable Distribution (0.05)**					
182					Theta Star	3.784						
183					nu star	873.4						
184												
185					A-D Test Statistic	3.911	**Nonparametric Statistics**					
186					5% A-D Critical Value	0.781					Kaplan-Meier (KM) Method	
187					K-S Test Statistic	0.781					Mean	4.101
188					5% K-S Critical Value	0.0476					SD	4.812
189	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.239
190											95% KM (t) UCL	4.495
191	**Assuming Gamma Distribution**										95% KM (z) UCL	4.494
192					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	4.495
193					Minimum	1E-09					95% KM (bootstrap t) UCL	4.521
194					Maximum	31.8					95% KM (BCA) UCL	4.506
195					Mean	4.088					95% KM (Percentile Bootstrap) UCL	4.488
196					Median	2.72					95% KM (Chebyshev) UCL	5.144
197					SD	4.829					97.5% KM (Chebyshev) UCL	5.596
198					k star	0.428					99% KM (Chebyshev) UCL	6.483
199					Theta star	9.561						
200					Nu star	346.3	**Potential UCLs to Use**					
201					AppChi2	304.2					95% KM (Chebyshev) UCL	5.144
202					95% Gamma Approximate UCL	4.654						
203					95% Adjusted Gamma UCL	4.656						
204	**Note: DL/2 is not a recommended method.**											
205												

General UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Selenium, dissolved (background)

General Statistics

Number of Valid Data	149	Number of Detected Data	104
Number of Distinct Detected Data	95	Number of Non-Detect Data	45
		Percent Non-Detects	30.20%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.001	Minimum Detected	-6.908
Maximum Detected	0.0136	Maximum Detected	-4.298
Mean of Detected	0.0029	Mean of Detected	-6.075
SD of Detected	0.0027	SD of Detected	0.607
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.001	Maximum Non-Detect	-6.908

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Lilliefors Test Statistic	0.241	Lilliefors Test Statistic	0.127
5% Lilliefors Critical Value	0.0869	5% Lilliefors Critical Value	0.0869
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00217	Mean	-6.536
SD	0.00251	SD	0.866
95% DL/2 (t) UCL	0.00252	95% H-Stat (DL/2) UCL	0.0019
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00165	Mean in Log Scale	-6.506
SD	0.0031	SD in Log Scale	0.861
95% MLE (t) UCL	0.00207	Mean in Original Scale	0.0022
95% MLE (Tiku) UCL	0.00208	SD in Original Scale	0.00249
		95% Percentile Bootstrap UCL	0.00254
		95% BCA Bootstrap UCL	0.00263

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	2.249	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.00129		
nu star	467.7		
A-D Test Statistic	5.44	**Nonparametric Statistics**	
5% A-D Critical Value	0.763	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.763	Mean	0.00233
5% K-S Critical Value	0.0894	SD	0.00241

54	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0001983
55											95% KM (t) UCL	0.00265
56	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00265
57	Gamma ROS Statistics using Extrapolated Data										95% KM (jackknife) UCL	0.00265
58	Minimum	1E-09									95% KM (bootstrap t) UCL	0.00275
59	Maximum	0.0136									95% KM (BCA) UCL	0.00267
60	Mean	0.00244									95% KM (Percentile Bootstrap) UCL	0.00268
61	Median	0.00184									95% KM (Chebyshev) UCL	0.00319
62	SD	0.00242									97.5% KM (Chebyshev) UCL	0.00356
63	k star	0.671									99% KM (Chebyshev) UCL	0.0043
64	Theta star	0.00363										
65	Nu star	200									**Potential UCLs to Use**	
66	AppChi2	168.3									95% KM (BCA) UCL	0.00267
67	95% Gamma Approximate UCL	0.0029										
68	95% Adjusted Gamma UCL	0.0029										
69	**Note: DL/2 is not a recommended method.**											
70												
71												
72	**Selenium, dissolved (flood)**											
73												
74	**General Statistics**											
75	Number of Valid Data	86									Number of Detected Data	35
76	Number of Distinct Detected Data	34									Number of Non-Detect Data	51
77											Percent Non-Detects	59.30%
78												
79	**Raw Statistics**							**Log-transformed Statistics**				
80	Minimum Detected	0.00106						Minimum Detected	-6.849			
81	Maximum Detected	0.023						Maximum Detected	-3.772			
82	Mean of Detected	0.00992						Mean of Detected	-4.871			
83	SD of Detected	0.00556						SD of Detected	0.866			
84	Minimum Non-Detect	0.001						Minimum Non-Detect	-6.908			
85	Maximum Non-Detect	0.04						Maximum Non-Detect	-3.219			
86												
87	Note: Data have multiple DLs - Use of KM Method is recommended							Number treated as Non-Detect	86			
88	For all methods (except KM, DL/2, and ROS Methods),							Number treated as Detected	0			
89	Observations < Largest ND are treated as NDs							Single DL Non-Detect Percentage	100.00%			
90												
91	**UCL Statistics**											
92	**Normal Distribution Test with Detected Values Only**							**Lognormal Distribution Test with Detected Values Only**				
93	Lilliefors Test Statistic	0.954						Lilliefors Test Statistic	0.817			
94	5% Lilliefors Critical Value	0.934						5% Lilliefors Critical Value	0.934			
95	**Data appear Normal at 5% Significance Level**							**Data not Lognormal at 5% Significance Level**				
96												
97	**Assuming Normal Distribution**							**Assuming Lognormal Distribution**				
98	DL/2 Substitution Method							DL/2 Substitution Method				
99	Mean	0.00566						Mean	-5.787			
100	SD	0.00553						SD	1.245			
101	95% DL/2 (t) UCL	0.00666						95% H-Stat (DL/2) UCL	0.00645			
102												
103	Maximum Likelihood Estimate(MLE) Method	N/A						Log ROS Method				
104	**MLE method failed to converge properly**							Mean in Log Scale	-6.004			
105								SD in Log Scale	1.24			
106								Mean in Original Scale	0.00491			

107											SD in Original Scale	0.00551
108											95% Percentile Bootstrap UCL	0.00593
109											95% BCA Bootstrap UCL	0.00596
110												
111	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
112					k star (bias corrected)	1.931	**Data appear Normal at 5% Significance Level**					
113					Theta Star	0.00514						
114					nu star	135.2						
115												
116					A-D Test Statistic	1.627	**Nonparametric Statistics**					
117					5% A-D Critical Value	0.759					Kaplan-Meier (KM) Method	
118					K-S Test Statistic	0.759					Mean	0.00492
119					5% K-S Critical Value	0.151					SD	0.00555
120	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0006238
121											95% KM (t) UCL	0.00596
122	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00595
123					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0059
124					Minimum	0.00106					95% KM (bootstrap t) UCL	0.00601
125					Maximum	0.023					95% KM (BCA) UCL	0.00614
126					Mean	0.01					95% KM (Percentile Bootstrap) UCL	0.00604
127					Median	0.0105					95% KM (Chebyshev) UCL	0.00764
128					SD	0.00394					97.5% KM (Chebyshev) UCL	0.00882
129					k star	4.118					99% KM (Chebyshev) UCL	0.0111
130					Theta star	0.00244						
131					Nu star	708.3	**Potential UCLs to Use**					
132					AppChi2	647.6					95% KM (t) UCL	0.00596
133					95% Gamma Approximate UCL	0.011					95% KM (Percentile Bootstrap) UCL	0.00604
134					95% Adjusted Gamma UCL	0.011						
135	**Note: DL/2 is not a recommended method.**											
136												
137												
138	**Selenium, dissolved (no flood)**											
139												
140	**General Statistics**											
141					Number of Valid Data	310					Number of Detected Data	133
142					Number of Distinct Detected Data	120					Number of Non-Detect Data	177
143											Percent Non-Detects	57.10%
144												
145	**Raw Statistics**						**Log-transformed Statistics**					
146					Minimum Detected	0.00103					Minimum Detected	-6.878
147					Maximum Detected	0.155					Maximum Detected	-1.864
148					Mean of Detected	0.00943					Mean of Detected	-5.304
149					SD of Detected	0.0197					SD of Detected	0.937
150					Minimum Non-Detect	0.001					Minimum Non-Detect	-6.908
151					Maximum Non-Detect	0.01					Maximum Non-Detect	-4.605
152												
153	Note: Data have multiple DLs - Use of KM Method is recommended										Number treated as Non-Detect	283
154	For all methods (except KM, DL/2, and ROS Methods),										Number treated as Detected	27
155	Observations < Largest ND are treated as NDs										Single DL Non-Detect Percentage	91.29%
156												
157	**UCL Statistics**											
158	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
159					Lilliefors Test Statistic	0.335					Lilliefors Test Statistic	0.121

160					5% Lilliefors Critical Value	0.0768					5% Lilliefors Critical Value	0.0768
161	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
162												
163	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
164					DL/2 Substitution Method						DL/2 Substitution Method	
165					Mean	0.00592					Mean	-5.627
166					SD	0.0133					SD	0.828
167					95% DL/2 (t) UCL	0.00716					95% H-Stat (DL/2) UCL	0.00588
168												
169					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
170	**MLE yields a negative mean**										Mean in Log Scale	-5.859
171											SD in Log Scale	1.002
172											Mean in Original Scale	0.00551
173											SD in Original Scale	0.0134
174											95% Percentile Bootstrap UCL	0.00678
175											95% BCA Bootstrap UCL	0.00718
176												
177	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
178					k star (bias corrected)	0.896	**Data do not follow a Discernable Distribution (0.05)**					
179					Theta Star	0.0105						
180					nu star	238.4						
181												
182					A-D Test Statistic	9.508	**Nonparametric Statistics**					
183					5% A-D Critical Value	0.788	Kaplan-Meier (KM) Method					
184					K-S Test Statistic	0.788					Mean	0.00551
185					5% K-S Critical Value	0.0836					SD	0.0133
186	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0007645
187											95% KM (t) UCL	0.00677
188	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00677
189					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00677
190					Minimum	0.00103					95% KM (bootstrap t) UCL	0.00794
191					Maximum	0.155					95% KM (BCA) UCL	0.00684
192					Mean	0.00949					95% KM (Percentile Bootstrap) UCL	0.00688
193					Median	0.00919					95% KM (Chebyshev) UCL	0.00884
194					SD	0.0129					97.5% KM (Chebyshev) UCL	0.0103
195					k star	1.95					99% KM (Chebyshev) UCL	0.0131
196					Theta star	0.00487						
197					Nu star	1209	**Potential UCLs to Use**					
198					AppChi2	1129					95% KM (t) UCL	0.00677
199					95% Gamma Approximate UCL	0.0102					95% KM (% Bootstrap) UCL	0.00688
200					95% Adjusted Gamma UCL	0.0102						
201	**Note: DL/2 is not a recommended method.**											
202												

1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	Silver, dissolved (background)											
10												
11					General Statistics							
12				Number of Valid Data	149			Number of Detected Data	8			
13				Number of Distinct Detected Data	8			Number of Non-Detect Data	141			
14								Percent Non-Detects	94.63%			
15												
16				Raw Statistics				Log-transformed Statistics				
17				Minimum Detected	0.00108			Minimum Detected	-6.831			
18				Maximum Detected	0.0103			Maximum Detected	-4.576			
19				Mean of Detected	0.00401			Mean of Detected	-5.793			
20				SD of Detected	0.00315			SD of Detected	0.81			
21				Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908			
22				Maximum Non-Detect	0.001			Maximum Non-Detect	-6.908			
23												
24												
25				Warning: There are only 8 Detected Values in this data								
26				Note: It should be noted that even though bootstrap may be performed on this data set								
27				the resulting calculations may not be reliable enough tp draw conclusions								
28												
29				It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.								
30												
31												
32					UCL Statistics							
33				Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only				
34				Lilliefors Test Statistic	0.869			Lilliefors Test Statistic	0.938			
35				5% Lilliefors Critical Value	0.818			5% Lilliefors Critical Value	0.818			
36				Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level				
37												
38				Assuming Normal Distribution				Assuming Lognormal Distribution				
39				DL/2 Substitution Method				DL/2 Substitution Method				
40				Mean	0.0006886			Mean	-7.504			
41				SD	0.00105			SD	0.445			
42				95% DL/2 (t) UCL	0.0008309			95% H-Stat (DL/2) UCL	0.0006123			
43												
44				Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method				
45				MLE yields a negative mean				Mean in Log Scale	-11.19			
46								SD in Log Scale	2.656			
47								Mean in Original Scale	0.0002859			
48								SD in Original Scale	0.00113			
49								95% Percentile Bootstrap UCL	0.0004547			
50								95% BCA Bootstrap UCL	0.000491			
51												
52				Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only				
53				k star (bias corrected)	1.313			Data appear Normal at 5% Significance Level				

54					Theta Star	0.00306						
55					nu star	21.01						
56												
57					A-D Test Statistic	0.299	**Nonparametric Statistics**					
58					5% A-D Critical Value	0.724					Kaplan-Meier (KM) Method	
59					K-S Test Statistic	0.724					Mean	0.00124
60					5% K-S Critical Value	0.298					SD	0.0009508
61				**Data appear Gamma Distributed at 5% Significance Level**							SE of Mean	8.327E-05
62											95% KM (t) UCL	0.00138
63				**Assuming Gamma Distribution**							95% KM (z) UCL	0.00137
64					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00137
65					Minimum	1E-09					95% KM (bootstrap t) UCL	0.00146
66					Maximum	0.0902					95% KM (BCA) UCL	0.00339
67					Mean	0.0478					95% KM (Percentile Bootstrap) UCL	0.00328
68					Median	0.0499					95% KM (Chebyshev) UCL	0.0016
69					SD	0.0267					97.5% KM (Chebyshev) UCL	0.00176
70					k star	1.35					99% KM (Chebyshev) UCL	0.00207
71					Theta star	0.0354						
72					Nu star	402.2	**Potential UCLs to Use**					
73					AppChi2	356.7					95% KM (t) UCL	0.00138
74					95% Gamma Approximate UCL	0.0539					95% KM (Percentile Bootstrap) UCL	0.00328
75					95% Adjusted Gamma UCL	0.054						
76	**Note: DL/2 is not a recommended method.**											
77												
78												
79	**Silver, dissolved (flood)**											
80												
81					**General Statistics**							
82					Number of Valid Data	79	Number of Detected Data					1
83					Number of Distinct Detected Data	1	Number of Non-Detect Data					78
84							Percent Non-Detects					98.73%
85												
86	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
87	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
88												
89	**The data set for variable Silver, dissolved (flood) was not processed!**											
90												
91												
92												
93	**Silver, dissolved (no flood)**											
94												
95					**General Statistics**							
96					Number of Valid Data	295	Number of Detected Data					7
97					Number of Distinct Detected Data	7	Number of Non-Detect Data					288
98							Percent Non-Detects					97.63%
99												
100				**Raw Statistics**			**Log-transformed Statistics**					
101					Minimum Detected	0.0059	Minimum Detected					-5.133
102					Maximum Detected	0.0873	Maximum Detected					-2.438
103					Mean of Detected	0.0372	Mean of Detected					-3.739
104					SD of Detected	0.0332	SD of Detected					1.087
105					Minimum Non-Detect	0.001	Minimum Non-Detect					-6.908
106					Maximum Non-Detect	0.005	Maximum Non-Detect					-5.298

107												
108	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect					288
109	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected					7
110	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage					97.63%
111												
112	**Warning: There are only 7 Detected Values in this data**											
113	**Note: It should be noted that even though bootstrap may be performed on this data set**											
114	**the resulting calculations may not be reliable enough tp draw conclusions**											
115												
116	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
117												
118												
119	**UCL Statistics**											
120	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
121	Lilliefors Test Statistic				0.846		Lilliefors Test Statistic					0.898
122	5% Lilliefors Critical Value				0.803		5% Lilliefors Critical Value					0.803
123	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
124												
125	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
126	DL/2 Substitution Method						DL/2 Substitution Method					
127	Mean				0.0024		Mean					-6.612
128	SD				0.00727		SD					0.849
129	95% DL/2 (t) UCL				0.0031		95% H-Stat (DL/2) UCL					0.00205
130												
131	Maximum Likelihood Estimate(MLE) Method				N/A		Log ROS Method					
132	**MLE yields a negative mean**						Mean in Log Scale					-13.08
133							SD in Log Scale					3.882
134							Mean in Original Scale					0.0009922
135							SD in Original Scale					0.00739
136							95% Percentile Bootstrap UCL					0.00173
137							95% BCA Bootstrap UCL					0.00201
138												
139	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
140	k star (bias corrected)				0.812		**Data appear Normal at 5% Significance Level**					
141	Theta Star				0.0458							
142	nu star				11.37							
143												
144	A-D Test Statistic				0.472		**Nonparametric Statistics**					
145	5% A-D Critical Value				0.724		Kaplan-Meier (KM) Method					
146	K-S Test Statistic				0.724		Mean					0.00664
147	5% K-S Critical Value				0.318		SD					0.00672
148	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean					0.0004225
149							95% KM (t) UCL					0.00734
150	**Assuming Gamma Distribution**						95% KM (z) UCL					0.00734
151	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.00835
152	Minimum				1E-09		95% KM (bootstrap t) UCL					0.00754
153	Maximum				2.633		95% KM (BCA) UCL					0.0204
154	Mean				1.156		95% KM (Percentile Bootstrap) UCL					0.0135
155	Median				1.099		95% KM (Chebyshev) UCL					0.00848
156	SD				0.792		97.5% KM (Chebyshev) UCL					0.00928
157	k star				0.977		99% KM (Chebyshev) UCL					0.0108
158	Theta star				1.183							
159	Nu star				576.4		**Potential UCLs to Use**					

	A	B	C	D	E	F	G	H	I	J	K	L
160					AppChi2	521.7				95% KM (t) UCL		0.00734
161					95% Gamma Approximate UCL	1.277				95% KM (Percentile Bootstrap) UCL		0.0135
162					95% Adjusted Gamma UCL	1.278						
163	**Note: DL/2 is not a recommended method.**											
164												

1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	Thallium, dissolved (background)											
10												
11					General Statistics							
12					Number of Valid Data	149			Number of Detected Data	4		
13					Number of Distinct Detected Data	4			Number of Non-Detect Data	145		
14									Percent Non-Detects	97.32%		
15												
16					Raw Statistics				Log-transformed Statistics			
17					Minimum Detected	0.00114			Minimum Detected	-6.777		
18					Maximum Detected	0.00295			Maximum Detected	-5.826		
19					Mean of Detected	0.00162			Mean of Detected	-6.518		
20					SD of Detected	0.000889			SD of Detected	0.462		
21					Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908		
22					Maximum Non-Detect	0.001			Maximum Non-Detect	-6.908		
23												
24												
25					Warning: There are only 4 Distinct Detected Values in this data							
26					Note: It should be noted that even though bootstrap may be performed on this data set							
27					the resulting calculations may not be reliable enough tp draw conclusions							
28												
29					It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.							
30												
31												
32					UCL Statistics							
33					Normal Distribution Test with Detected Values Only				Lognormal Distribution Test with Detected Values Only			
34					Lilliefors Test Statistic	0.663			Lilliefors Test Statistic	0.684		
35					5% Lilliefors Critical Value	0.748			5% Lilliefors Critical Value	0.748		
36					Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
37												
38					Assuming Normal Distribution				Assuming Lognormal Distribution			
39					DL/2 Substitution Method				DL/2 Substitution Method			
40					Mean	0.00053			Mean	-7.572		
41					SD	0.0002211			SD	0.188		
42					95% DL/2 (t) UCL	0.00056			95% H-Stat (DL/2) UCL	0.0005305		
43												
44					Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method			
45					MLE method failed to converge properly				Mean in Log Scale	-10.62		
46									SD in Log Scale	1.783		
47									Mean in Original Scale	0.0001108		
48									SD in Original Scale	0.0003035		
49									95% Percentile Bootstrap UCL	0.000154		
50									95% BCA Bootstrap UCL	0.0001733		
51												
52					Gamma Distribution Test with Detected Values Only				Data Distribution Test with Detected Values Only			
53					k star (bias corrected)	1.583			Data do not follow a Discernable Distribution (0.05)			

54					Theta Star	0.00102						
55					nu star	12.66						
56												
57					A-D Test Statistic	0.846	**Nonparametric Statistics**					
58					5% A-D Critical Value	0.659				Kaplan-Meier (KM) Method		
59					K-S Test Statistic	0.659				Mean		0.00115
60					5% K-S Critical Value	0.396				SD		0.0001479
61				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		1.399E-05
62										95% KM (t) UCL		0.00118
63				**Assuming Gamma Distribution**						95% KM (z) UCL		0.00118
64					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.00117
65					Minimum	0.0007928				95% KM (bootstrap t) UCL		0.00143
66					Maximum	0.0261				95% KM (BCA) UCL		0.00295
67					Mean	0.0155				95% KM (Percentile Bootstrap) UCL		0.00124
68					Median	0.0164				95% KM (Chebyshev) UCL		0.00121
69					SD	0.00709				97.5% KM (Chebyshev) UCL		0.00124
70					k star	2.869				99% KM (Chebyshev) UCL		0.00129
71					Theta star	0.00539						
72					Nu star	855.1	**Potential UCLs to Use**					
73					AppChi2	788.2				95% KM (t) UCL		0.00118
74					95% Gamma Approximate UCL	0.0168				95% KM (% Bootstrap) UCL		0.00124
75					95% Adjusted Gamma UCL	N/A						
76	**Note: DL/2 is not a recommended method.**											
77												
78												
79	**Thallium, dissolved (flood)**											
80												
81						**General Statistics**						
82					Number of Valid Data	79				Number of Detected Data		0
83					Number of Distinct Detected Data	0				Number of Non-Detect Data		79
84										Percent Non-Detects		100.00%
85												
86	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
87	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
88	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
89												
90	**The data set for variable Thallium, dissolved (flood) was not processed!**											
91												
92												
93												
94	**Thallium, dissolved (no flood)**											
95												
96						**General Statistics**						
97					Number of Valid Data	295				Number of Detected Data		2
98					Number of Distinct Detected Data	2				Number of Non-Detect Data		293
99										Percent Non-Detects		99.32%
100												
101					**Raw Statistics**		**Log-transformed Statistics**					
102					Minimum Detected	0.00111				Minimum Detected		-6.803
103					Maximum Detected	0.0012				Maximum Detected		-6.725
104					Mean of Detected	0.00116				Mean of Detected		-6.764
105					SD of Detected	6.364E-05				SD of Detected		0.0551
106					Minimum Non-Detect	0.001				Minimum Non-Detect		-6.908

107				Maximum Non-Detect	0.015					Maximum Non-Detect	-4.2	
108												
109	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	295	
110	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
111	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
112												
113	**Warning: Data set has only 2 Distinct Detected Values.**											
114	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
115	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
116												
117	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
118												
119	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
120	**Those methods will return a 'N/A' value on your output display!**											
121												
122	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
123	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
124												
125												
126	**UCL Statistics**											
127	**Normal Distribution Test with Detected Values Only**									**Lognormal Distribution Test with Detected Values Only**		
128				Lilliefors Test Statistic	1					Lilliefors Test Statistic	1	
129				5% Lilliefors Critical Value	N/A					5% Lilliefors Critical Value	N/A	
130	**Data not Normal at 5% Significance Level**									**Data not Lognormal at 5% Significance Level**		
131												
132	**Assuming Normal Distribution**									**Assuming Lognormal Distribution**		
133				DL/2 Substitution Method						DL/2 Substitution Method		
134				Mean	0.0023					Mean	-6.841	
135				SD	0.00298					SD	1.147	
136				95% DL/2 (t) UCL	0.00259					95% H-Stat (DL/2) UCL	0.0024	
137												
138				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
139	**MLE method failed to converge properly**									Mean in Log Scale	N/A	
140										SD in Log Scale	N/A	
141										Mean in Original Scale	N/A	
142										SD in Original Scale	N/A	
143										95% Percentile Bootstrap UCL	N/A	
144										95% BCA Bootstrap UCL	N/A	
145												
146	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
147				k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**		
148				Theta Star	N/A							
149				nu star	N/A							
150												
151				A-D Test Statistic	0.359					**Nonparametric Statistics**		
152				5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method		
153				K-S Test Statistic	N/A					Mean	0.00111	
154				5% K-S Critical Value	N/A					SD	6.495E-06	
155	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	6.646E-07	
156										95% KM (t) UCL	0.00111	
157	**Assuming Gamma Distribution**									95% KM (z) UCL	0.00111	
158				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00117	
159				Minimum	N/A					95% KM (bootstrap t) UCL	0.00111	

	A	B	C	D	E	F	G	H	I	J	K	L
160					Maximum	N/A				95% KM (BCA) UCL		N/A
161					Mean	N/A				95% KM (Percentile Bootstrap) UCL		N/A
162					Median	N/A				95% KM (Chebyshev) UCL		0.00111
163					SD	N/A				97.5% KM (Chebyshev) UCL		0.00111
164					k star	N/A				99% KM (Chebyshev) UCL		0.00112
165					Theta star	N/A						
166					Nu star	N/A				**Potential UCLs to Use**		
167					AppChi2	N/A				95% KM (t) UCL		0.00111
168				95% Gamma Approximate UCL		N/A				95% KM (% Bootstrap) UCL		N/A
169				95% Adjusted Gamma UCL		N/A						
170	**Note: DL/2 is not a recommended method.**											
171												

1				**General UCL Statistics for Data Sets with Non-Detects**								
2		**User Selected Options**										
3			From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	**Vanadium, dissolved (background)**											
10												
11						**General Statistics**							
12						Number of Valid Data	149			Number of Detected Data	127	
13						Number of Distinct Detected Data	109			Number of Non-Detect Data	22	
14										Percent Non-Detects	14.77%	
15												
16						**Raw Statistics**				**Log-transformed Statistics**		
17						Minimum Detected	0.00102			Minimum Detected	-6.888	
18						Maximum Detected	0.0803			Maximum Detected	-2.522	
19						Mean of Detected	0.0162			Mean of Detected	-4.373	
20						SD of Detected	0.0125			SD of Detected	0.741	
21						Minimum Non-Detect	0.001			Minimum Non-Detect	-6.908	
22						Maximum Non-Detect	0.0193			Maximum Non-Detect	-3.948	
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	113	
25	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	36	
26	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	75.84%	
27												
28						**UCL Statistics**							
29						**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**		
30						Lilliefors Test Statistic	0.196			Lilliefors Test Statistic	0.098	
31						5% Lilliefors Critical Value	0.0786			5% Lilliefors Critical Value	0.0786	
32						**Data not Normal at 5% Significance Level**				**Data not Lognormal at 5% Significance Level**		
33												
34						**Assuming Normal Distribution**				**Assuming Lognormal Distribution**		
35						DL/2 Substitution Method				DL/2 Substitution Method		
36						Mean	0.0139			Mean	-4.827	
37						SD	0.0128			SD	1.312	
38						95% DL/2 (t) UCL	0.0157			95% H-Stat (DL/2) UCL	0.0183	
39												
40						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		
41						Mean	0.00216			Mean in Log Scale	-4.603	
42						SD	0.0227			SD in Log Scale	0.893	
43						95% MLE (t) UCL	0.00524			Mean in Original Scale	0.0142	
44						95% MLE (Tiku) UCL	0.00865			SD in Original Scale	0.0125	
45										95% Percentile Bootstrap UCL	0.0159	
46										95% BCA Bootstrap UCL	0.0162	
47												
48						**Gamma Distribution Test with Detected Values Only**				**Data Distribution Test with Detected Values Only**		
49						k star (bias corrected)	2.105			**Data do not follow a Discernable Distribution (0.05)**		
50						Theta Star	0.00769					
51						nu star	534.6					
52												
53						A-D Test Statistic	1.108			**Nonparametric Statistics**		

54				5% A-D Critical Value	0.764					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.764					Mean		0.014
56				5% K-S Critical Value	0.0835					SD		0.0127
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.00104
58										95% KM (t) UCL		0.0157
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.0157
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0157
61				Minimum	1E-09					95% KM (bootstrap t) UCL		0.016
62				Maximum	0.0803					95% KM (BCA) UCL		0.016
63				Mean	0.0141					95% KM (Percentile Bootstrap) UCL		0.0158
64				Median	0.0122					95% KM (Chebyshev) UCL		0.0186
65				SD	0.0127					97.5% KM (Chebyshev) UCL		0.0205
66				k star	0.505					99% KM (Chebyshev) UCL		0.0244
67				Theta star	0.028							
68				Nu star	150.5					**Potential UCLs to Use**		
69				AppChi2	123.1					95% KM (BCA) UCL		0.016
70				95% Gamma Approximate UCL	0.0173							
71				95% Adjusted Gamma UCL	0.0173							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Vanadium, dissolved (flood)**											
76												
77						**General Statistics**							
78				Number of Valid Data	115					Number of Detected Data		77
79				Number of Distinct Detected Data	71					Number of Non-Detect Data		38
80										Percent Non-Detects		33.04%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.00096					Minimum Detected		-6.949
84				Maximum Detected	0.238					Maximum Detected		-1.435
85				Mean of Detected	0.0265					Mean of Detected		-4.796
86				SD of Detected	0.053					SD of Detected		1.386
87				Minimum Non-Detect	0.001					Minimum Non-Detect		-6.908
88				Maximum Non-Detect	0.012					Maximum Non-Detect		-4.423
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		94
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		21
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		81.74%
93												
94						**UCL Statistics**							
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Lilliefors Test Statistic	0.396					Lilliefors Test Statistic		0.135
97				5% Lilliefors Critical Value	0.101					5% Lilliefors Critical Value		0.101
98				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	0.0186					Mean		-5.222
103				SD	0.0447					SD		1.334
104				95% DL/2 (t) UCL	0.0255					95% H-Stat (DL/2) UCL		0.0148
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	**MLE yields a negative mean**									Mean in Log Scale		-5.361
108										SD in Log Scale		1.494
109										Mean in Original Scale		0.0185
110										SD in Original Scale		0.0448
111										95% Percentile Bootstrap UCL		0.0257
112										95% BCA Bootstrap UCL		0.0268
113												
114	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
115					k star (bias corrected)		0.527			**Data do not follow a Discernable Distribution (0.05)**		
116					Theta Star		0.0502					
117					nu star		81.15					
118												
119					A-D Test Statistic		6.582			**Nonparametric Statistics**		
120					5% A-D Critical Value		0.814			Kaplan-Meier (KM) Method		
121					K-S Test Statistic		0.814			Mean		0.0185
122					5% K-S Critical Value		0.107			SD		0.0446
123	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.00419
124										95% KM (t) UCL		0.0254
125	**Assuming Gamma Distribution**									95% KM (z) UCL		0.0254
126					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.0254
127					Minimum		1E-09			95% KM (bootstrap t) UCL		0.0284
128					Maximum		0.238			95% KM (BCA) UCL		0.026
129					Mean		0.0221			95% KM (Percentile Bootstrap) UCL		0.0259
130					Median		0.0065			95% KM (Chebyshev) UCL		0.0367
131					SD		0.0454			97.5% KM (Chebyshev) UCL		0.0446
132					k star		0.203			99% KM (Chebyshev) UCL		0.0602
133					Theta star		0.109					
134					Nu star		46.8			**Potential UCLs to Use**		
135					AppChi2		32.1			95% KM (Chebyshev) UCL		0.0367
136					95% Gamma Approximate UCL		0.0322					
137					95% Adjusted Gamma UCL		0.0324					
138	**Note: DL/2 is not a recommended method.**											
139												
140												
141	**Vanadium, dissolved (no flood)**											
142												
143							**General Statistics**					
144					Number of Valid Data		347			Number of Detected Data		295
145					Number of Distinct Detected Data		229			Number of Non-Detect Data		52
146										Percent Non-Detects		14.99%
147												
148					**Raw Statistics**					**Log-transformed Statistics**		
149					Minimum Detected		0.0012			Minimum Detected		-6.725
150					Maximum Detected		0.326			Maximum Detected		-1.121
151					Mean of Detected		0.0222			Mean of Detected		-4.402
152					SD of Detected		0.033			SD of Detected		1.039
153					Minimum Non-Detect		0.001			Minimum Non-Detect		-6.908
154					Maximum Non-Detect		0.01			Maximum Non-Detect		-4.605
155												
156	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		188
157	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		159
158	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		54.18%
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160	**UCL Statistics**											
161	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
162					Lilliefors Test Statistic	0.262					Lilliefors Test Statistic	0.0729
163					5% Lilliefors Critical Value	0.0516					5% Lilliefors Critical Value	0.0516
164	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
165												
166	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
167					DL/2 Substitution Method						DL/2 Substitution Method	
168					Mean	0.0193					Mean	-4.641
169					SD	0.0312					SD	1.133
170					95% DL/2 (t) UCL	0.022					95% H-Stat (DL/2) UCL	0.0187
171												
172					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
173	**MLE yields a negative mean**										Mean in Log Scale	-4.653
174											SD in Log Scale	1.16
175											Mean in Original Scale	0.0193
176											SD in Original Scale	0.0312
177											95% Percentile Bootstrap UCL	0.022
178											95% BCA Bootstrap UCL	0.0227
179												
180	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
181					k star (bias corrected)	0.97	**Data do not follow a Discernable Distribution (0.05)**					
182					Theta Star	0.0229						
183					nu star	572.2						
184												
185					A-D Test Statistic	8.743	**Nonparametric Statistics**					
186					5% A-D Critical Value	0.785					Kaplan-Meier (KM) Method	
187					K-S Test Statistic	0.785					Mean	0.0193
188					5% K-S Critical Value	0.0543					SD	0.0311
189	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00167
190											95% KM (t) UCL	0.0221
191	**Assuming Gamma Distribution**										95% KM (z) UCL	0.022
192					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.022
193					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0228
194					Maximum	0.326					95% KM (BCA) UCL	0.0224
195					Mean	0.0193					95% KM (Percentile Bootstrap) UCL	0.0222
196					Median	0.0092					95% KM (Chebyshev) UCL	0.0266
197					SD	0.0312					97.5% KM (Chebyshev) UCL	0.0297
198					k star	0.323					99% KM (Chebyshev) UCL	0.0359
199					Theta star	0.0595						
200					Nu star	224.5	**Potential UCLs to Use**					
201					AppChi2	190.8					95% KM (Chebyshev) UCL	0.0266
202					95% Gamma Approximate UCL	0.0227						
203					95% Adjusted Gamma UCL	0.0227						
204	**Note: DL/2 is not a recommended method.**											
205												

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Zinc, dissolved (background)											
10												
11	General Statistics											
12	Number of Valid Data			143		Number of Detected Data					94	
13	Number of Distinct Detected Data			87		Number of Non-Detect Data					49	
14						Percent Non-Detects					34.27%	
15												
16	Raw Statistics					Log-transformed Statistics						
17	Minimum Detected			0.0106		Minimum Detected					-4.547	
18	Maximum Detected			0.137		Maximum Detected					-1.988	
19	Mean of Detected			0.0388		Mean of Detected					-3.476	
20	SD of Detected			0.0283		SD of Detected					0.666	
21	Minimum Non-Detect			0.01		Minimum Non-Detect					-4.605	
22	Maximum Non-Detect			0.0162		Maximum Non-Detect					-4.123	
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect					66	
25	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected					77	
26	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage					46.15%	
27												
28	UCL Statistics											
29	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
30	Lilliefors Test Statistic			0.177		Lilliefors Test Statistic					0.0876	
31	5% Lilliefors Critical Value			0.0914		5% Lilliefors Critical Value					0.0914	
32	Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level						
33												
34	Assuming Normal Distribution					Assuming Lognormal Distribution						
35	DL/2 Substitution Method					DL/2 Substitution Method						
36	Mean			0.0273		Mean					-4.095	
37	SD			0.028		SD					1.017	
38	95% DL/2 (t) UCL			0.0311		95% H-Stat (DL/2) UCL					0.0268	
39												
40	Maximum Likelihood Estimate(MLE) Method					Log ROS Method						
41	Mean			0.017		Mean in Log Scale					-4.026	
42	SD			0.0396		SD in Log Scale					0.978	
43	95% MLE (t) UCL			0.0225		Mean in Original Scale					0.0279	
44	95% MLE (Tiku) UCL			0.0235		SD in Original Scale					0.0275	
45						95% Percentile Bootstrap UCL					0.0316	
46						95% BCA Bootstrap UCL					0.0323	
47												
48	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
49	k star (bias corrected)			2.286		Data appear Lognormal at 5% Significance Level						
50	Theta Star			0.017								
51	nu star			429.9								
52												
53	A-D Test Statistic			1.668		Nonparametric Statistics						

54				5% A-D Critical Value	0.763					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.763					Mean		0.0292
56				5% K-S Critical Value	0.0933					SD		0.0265
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.00222
58										95% KM (t) UCL		0.0328
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.0328
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0327
61				Minimum	1E-09					95% KM (bootstrap t) UCL		0.0332
62				Maximum	0.137					95% KM (BCA) UCL		0.0334
63				Mean	0.0331					95% KM (Percentile Bootstrap) UCL		0.0328
64				Median	0.0265					95% KM (Chebyshev) UCL		0.0389
65				SD	0.0256					97.5% KM (Chebyshev) UCL		0.0431
66				k star	0.598					99% KM (Chebyshev) UCL		0.0513
67				Theta star	0.0553							
68				Nu star	171					**Potential UCLs to Use**		
69				AppChi2	141.7					95% KM (BCA) UCL		0.0334
70				95% Gamma Approximate UCL	0.0399							
71				95% Adjusted Gamma UCL	0.04							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Zinc, dissolved (flood)**											
76												
77										**General Statistics**		
78				Number of Valid Data	345					Number of Detected Data		270
79				Number of Distinct Detected Data	202					Number of Non-Detect Data		75
80										Percent Non-Detects		21.74%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.0049					Minimum Detected		-5.319
84				Maximum Detected	0.817					Maximum Detected		-0.202
85				Mean of Detected	0.0889					Mean of Detected		-3.068
86				SD of Detected	0.118					SD of Detected		1.149
87				Minimum Non-Detect	0.005					Minimum Non-Detect		-5.298
88				Maximum Non-Detect	0.2					Maximum Non-Detect		-1.609
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		313
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		32
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		90.72%
93												
94										**UCL Statistics**		
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Lilliefors Test Statistic	0.239					Lilliefors Test Statistic		0.0437
97				5% Lilliefors Critical Value	0.0539					5% Lilliefors Critical Value		0.0539
98				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	0.073					Mean		-3.397
103				SD	0.109					SD		1.255
104				95% DL/2 (t) UCL	0.0827					95% H-Stat (DL/2) UCL		0.0736
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	**MLE yields a negative mean**									Mean in Log Scale		-3.439
108										SD in Log Scale		1.289
109										Mean in Original Scale		0.072
110										SD in Original Scale		0.11
111										95% Percentile Bootstrap UCL		0.0813
112										95% BCA Bootstrap UCL		0.0832
113												
114	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
115					k star (bias corrected)	0.894				**Data appear Lognormal at 5% Significance Level**		
116					Theta Star	0.0995						
117					nu star	482.7						
118												
119					A-D Test Statistic	4.519				**Nonparametric Statistics**		
120					5% A-D Critical Value	0.789				Kaplan-Meier (KM) Method		
121					K-S Test Statistic	0.789				Mean		0.0723
122					5% K-S Critical Value	0.0574				SD		0.109
123	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.00591
124										95% KM (t) UCL		0.0821
125	**Assuming Gamma Distribution**									95% KM (z) UCL		0.082
126					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.082
127					Minimum	1E-09				95% KM (bootstrap t) UCL		0.0829
128					Maximum	0.817				95% KM (BCA) UCL		0.0821
129					Mean	0.0755				95% KM (Percentile Bootstrap) UCL		0.0821
130					Median	0.0398				95% KM (Chebyshev) UCL		0.0981
131					SD	0.109				97.5% KM (Chebyshev) UCL		0.109
132					k star	0.313				99% KM (Chebyshev) UCL		0.131
133					Theta star	0.241						
134					Nu star	216.1				**Potential UCLs to Use**		
135					AppChi2	183.1				95% KM (Chebyshev) UCL		0.0981
136					95% Gamma Approximate UCL	0.0891						
137					95% Adjusted Gamma UCL	0.0891						
138	**Note: DL/2 is not a recommended method.**											
139												
140												
141	**Zinc, dissolved (no flood)**											
142												
143						**General Statistics**						
144					Number of Valid Data	704				Number of Detected Data		455
145					Number of Distinct Detected Data	284				Number of Non-Detect Data		249
146										Percent Non-Detects		35.37%
147												
148	**Raw Statistics**									**Log-transformed Statistics**		
149					Minimum Detected	0.0033				Minimum Detected		-5.714
150					Maximum Detected	1.5				Maximum Detected		0.405
151					Mean of Detected	0.0839				Mean of Detected		-3.243
152					SD of Detected	0.141				SD of Detected		1.166
153					Minimum Non-Detect	0.005				Minimum Non-Detect		-5.298
154					Maximum Non-Detect	0.097				Maximum Non-Detect		-2.333
155												
156	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		610
157	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		94
158	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		86.65%
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160	**UCL Statistics**											
161	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
162					Lilliefors Test Statistic	0.283					Lilliefors Test Statistic	0.0851
163					5% Lilliefors Critical Value	0.0415					5% Lilliefors Critical Value	0.0415
164	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
165												
166	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
167					DL/2 Substitution Method						DL/2 Substitution Method	
168					Mean	0.0574					Mean	-3.823
169					SD	0.119					SD	1.261
170					95% DL/2 (t) UCL	0.0647					95% H-Stat (DL/2) UCL	0.0458
171												
172					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
173	**MLE yields a negative mean**										Mean in Log Scale	-3.95
174											SD in Log Scale	1.436
175											Mean in Original Scale	0.0568
176											SD in Original Scale	0.119
177											95% Percentile Bootstrap UCL	0.0649
178											95% BCA Bootstrap UCL	0.0648
179												
180	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
181					k star (bias corrected)	0.775	**Data do not follow a Discernable Distribution (0.05)**					
182					Theta Star	0.108						
183					nu star	705.1						
184												
185					A-D Test Statistic	19.17	**Nonparametric Statistics**					
186					5% A-D Critical Value	0.796					Kaplan-Meier (KM) Method	
187					K-S Test Statistic	0.796					Mean	0.0572
188					5% K-S Critical Value	0.0442					SD	0.119
189	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00448
190											95% KM (t) UCL	0.0646
191	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0646
192					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0646
193					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0658
194					Maximum	1.5					95% KM (BCA) UCL	0.0644
195					Mean	0.0702					95% KM (Percentile Bootstrap) UCL	0.065
196					Median	0.031					95% KM (Chebyshev) UCL	0.0767
197					SD	0.119					97.5% KM (Chebyshev) UCL	0.0852
198					k star	0.259					99% KM (Chebyshev) UCL	0.102
199					Theta star	0.271						
200					Nu star	364.4	**Potential UCLs to Use**					
201					AppChi2	321.2					95% KM (Chebyshev) UCL	0.0767
202					95% Gamma Approximate UCL	0.0797						
203					95% Adjusted Gamma UCL	0.0797						
204	**Note: DL/2 is not a recommended method.**											
205												

ARCADIS

Site-Wide

Quantile Outputs

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Aluminum, dissolved(site)

Background Data: Aluminum, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	294	149
Number of Non-Detect Data	273	122
Number of Detect Data	21	27
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.52	0.101
Percent Non detects	92.86%	81.88%
Minimum Detected	0.0535	0.0509
Maximum Detected	0.749	0.164
Mean of Detected Data	0.122	0.0784
Median of Detected Data	0.0679	0.0616
SD of Detected Data	0.149	0.0327

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
R Value Adjusted for Ties in Data	11
K Value Adjusted for Ties in Data	10
Number of Site Observations in 'R' Largest	11

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Ammonia as nitrogen(site)

Background Data: Ammonia as nitrogen(background)

Raw Statistics

	Site	Background
Number of Valid Data	569	149
Number of Non-Detect Data	449	141
Number of Detect Data	120	8
Minimum Non-Detect	0.02	0.5
Maximum Non-Detect	1	0.5
Percent Non detects	78.91%	94.63%
Minimum Detected	0.062	0.586
Maximum Detected	180	1.06
Mean of Detected Data	3.624	0.751
Median of Detected Data	1	0.69
SD of Detected Data	16.5	0.178

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7
Calculated Alpha	N/A

Conclusion with Alpha = 0.059

Reject H0, Conclude Site Concentration > Background Concentration

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Antimony, dissolved(site)

Background Data: Antimony, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	384	149
Number of Non-Detect Data	375	148
Number of Detect Data	9	1
Minimum Non-Detect	0.002	0.002
Maximum Non-Detect	0.02	0.002
Percent Non detects	97.66%	99.33%
Minimum Detected	0.0033	0.00232
Maximum Detected	0.155	0.00232
Mean of Detected Data	0.0482	0.00232
Median of Detected Data	0.0209	0.00232
SD of Detected Data	0.0611	N/A

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Arsenic, dissolved(site)

Background Data: Arsenic, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	460	132
Number of Non-Detect Data	270	3
Number of Detect Data	190	129
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.04	0.001
Percent Non detects	58.70%	2.27%
Minimum Detected	0.00105	0.00107
Maximum Detected	0.157	0.0191
Mean of Detected Data	0.013	0.00598
Median of Detected Data	0.00363	0.0054
SD of Detected Data	0.027	0.00389

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7
Calculated Alpha	N/A

Conclusion with Alpha = 0.059

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Barium, dissolved(site)

Background Data: Barium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	559	149
Number of Non-Detect Data	198	0
Number of Detect Data	361	149
Minimum Non-Detect	0.001	N/A
Maximum Non-Detect	0.5	N/A
Percent Non detects	35.42%	0.00%
Minimum Detected	0.00917	0.0115
Maximum Detected	5.3	0.188
Mean of Detected Data	0.095	0.06
Median of Detected Data	0.0518	0.0488
SD of Detected Data	0.393	0.0381

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
R Value Adjusted for Ties in Data	66
K Value Adjusted for Ties in Data	65
Number of Site Observations in 'R' Largest	66

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Beryllium, dissolved(site)

Background Data: Beryllium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	374	149
Number of Non-Detect Data	354	148
Number of Detect Data	20	1
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.012	0.001
Percent Non detects	94.65%	99.33%
Minimum Detected	0.0011	0.00148
Maximum Detected	0.0088	0.00148
Mean of Detected Data	0.00226	0.00148
Median of Detected Data	0.00215	0.00148
SD of Detected Data	0.00164	N/A

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Chloride(site)

Background Data: Chloride(background)

Raw Statistics

	Site	Background
Number of Valid Data	825	149
Number of Non-Detect Data	0	0
Number of Detect Data	825	149
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	18.9	24.4
Maximum Detected	22300	4070
Mean of Detected Data	2848	365.4
Median of Detected Data	2040	145
SD of Detected Data	3154	767.9

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7
Calculated Alpha	N/A

Conclusion with Alpha = 0.059

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Chromium, dissolved(site)

Background Data: Chromium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	2881	148
Number of Non-Detect Data	993	43
Number of Detect Data	1888	105
Minimum Non-Detect	0	0.001
Maximum Non-Detect	0.8	0.001
Percent Non detects	34.47%	29.05%
Minimum Detected	0.001	0.00104
Maximum Detected	16.4	0.0404
Mean of Detected Data	1.473	0.0121
Median of Detected Data	0.287	0.0106
SD of Detected Data	2.545	0.00906

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
R Value Adjusted for Ties in Data	8
K Value Adjusted for Ties in Data	7
Number of Site Observations in 'R' Largest	8
Calculated Alpha	N/A

Conclusion with Alpha = 0.059

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Cobalt, dissolved(site)

Background Data: Cobalt, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	374	149
Number of Non-Detect Data	361	145
Number of Detect Data	13	4
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.012	0.001
Percent Non detects	96.52%	97.32%
Minimum Detected	0.00101	0.00101
Maximum Detected	0.01	0.00164
Mean of Detected Data	0.00216	0.00136
Median of Detected Data	0.00123	0.00139
SD of Detected Data	0.00258	0.0002611

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
R Value Adjusted for Ties in Data	138
K Value Adjusted for Ties in Data	137
Number of Site Observations in 'R' Largest	138

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Copper, dissolved(site)

Background Data: Copper, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	1049	149
Number of Non-Detect Data	691	45
Number of Detect Data	358	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	65.87%	30.20%
Minimum Detected	0.00103	0.00101
Maximum Detected	0.306	0.0205
Mean of Detected Data	0.0119	0.00417
Median of Detected Data	0.0052	0.00318
SD of Detected Data	0.0265	0.00404

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
R Value Adjusted for Ties in Data	19
K Value Adjusted for Ties in Data	18
Number of Site Observations in 'R' Largest	19

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Fluoride(site)

Background Data: Fluoride(background)

Raw Statistics

	Site	Background
Number of Valid Data	491	143
Number of Non-Detect Data	65	25
Number of Detect Data	426	118
Minimum Non-Detect	0.1	0.5
Maximum Non-Detect	13.4	0.5
Percent Non detects	13.24%	17.48%
Minimum Detected	0.05	0.525
Maximum Detected	24.6	4.34
Mean of Detected Data	2.788	1.698
Median of Detected Data	2.3	1.525
SD of Detected Data	2.334	1.024

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
R Value Adjusted for Ties in Data	9
K Value Adjusted for Ties in Data	8
Number of Site Observations in 'R' Largest	9

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Hexavalent chromium(site)

Background Data: Hexavalent chromium(background)

Raw Statistics

	Site	Background
Number of Valid Data	2780	148
Number of Non-Detect Data	1130	38
Number of Detect Data	1650	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	40.65%	25.68%
Minimum Detected	0.00024	0.00022
Maximum Detected	15.7	0.0376
Mean of Detected Data	1.641	0.0102
Median of Detected Data	0.46	0.00885
SD of Detected Data	2.572	0.00844

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7
Calculated Alpha	N/A

Conclusion with Alpha = 0.059

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Iron, dissolved(site)

Background Data: Iron, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	684	147
Number of Non-Detect Data	532	121
Number of Detect Data	152	26
Minimum Non-Detect	0.02	0.1
Maximum Non-Detect	2.5	0.673
Percent Non detects	77.78%	82.31%
Minimum Detected	0.0245	0.104
Maximum Detected	21	5.07
Mean of Detected Data	2.707	1.216
Median of Detected Data	1.21	0.536
SD of Detected Data	3.773	1.434

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7
Calculated Alpha	N/A

Conclusion with Alpha = 0.059

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Lead, dissolved(site)

Background Data: Lead, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	474	147
Number of Non-Detect Data	412	125
Number of Detect Data	62	22
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.1	0.001
Percent Non detects	86.92%	85.03%
Minimum Detected	0.00083	0.00102
Maximum Detected	0.076	0.00409
Mean of Detected Data	0.00887	0.00199
Median of Detected Data	0.0035	0.00162
SD of Detected Data	0.016	0.0009179

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Molybdenum, dissolved(site)

Background Data: Molybdenum, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	563	149
Number of Non-Detect Data	35	1
Number of Detect Data	528	148
Minimum Non-Detect	0.002	0.00758
Maximum Non-Detect	0.05	0.00758
Percent Non detects	6.22%	0.67%
Minimum Detected	0.00085	0.0035
Maximum Detected	0.301	0.0417
Mean of Detected Data	0.0308	0.0113
Median of Detected Data	0.0218	0.00866
SD of Detected Data	0.0302	0.00752

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7
Calculated Alpha	N/A

Conclusion with Alpha = 0.059

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nickel, dissolved(site)

Background Data: Nickel, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	1049	149
Number of Non-Detect Data	570	96
Number of Detect Data	479	53
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	54.34%	64.43%
Minimum Detected	0.00069	0.001
Maximum Detected	0.5	0.0415
Mean of Detected Data	0.0132	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.0392	0.00635

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
R Value Adjusted for Ties in Data	8
K Value Adjusted for Ties in Data	7
Number of Site Observations in 'R' Largest	8

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Nitrate as Nitrogen(site)

Background Data: Nitrate as Nitrogen(background)

Raw Statistics

	Site	Background
Number of Valid Data	844	148
Number of Non-Detect Data	271	30
Number of Detect Data	573	118
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	200	0.5
Percent Non detects	32.11%	20.27%
Minimum Detected	0.107	0.687
Maximum Detected	31.8	4.75
Mean of Detected Data	4.522	2.587
Median of Detected Data	2.99	2.52
SD of Detected Data	4.781	0.984

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

1	**Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects**	
2	**User Selected Options**	
3	From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_
4	Full Precision	OFF
5	Confidence Coefficient	95%
6	Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
7	Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Selenium, dissolved(site)

Background Data: Selenium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	396	149
Number of Non-Detect Data	228	45
Number of Detect Data	168	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.04	0.001
Percent Non detects	57.58%	30.20%
Minimum Detected	0.00103	0.001
Maximum Detected	0.155	0.0136
Mean of Detected Data	0.00953	0.0029
Median of Detected Data	0.00527	0.00199
SD of Detected Data	0.0177	0.0027

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Silver, dissolved(site)

Background Data: Silver, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	374	149
Number of Non-Detect Data	366	141
Number of Detect Data	8	8
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.05	0.001
Percent Non detects	97.86%	94.63%
Minimum Detected	0.0059	0.00108
Maximum Detected	0.0873	0.0103
Mean of Detected Data	0.0376	0.00401
Median of Detected Data	0.0302	0.0036
SD of Detected Data	0.0307	0.00315

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Thallium, dissolved(site)

Background Data: Thallium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	374	149
Number of Non-Detect Data	372	145
Number of Detect Data	2	4
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.06	0.001
Percent Non detects	99.47%	97.32%
Minimum Detected	0.00111	0.00114
Maximum Detected	0.0012	0.00295
Mean of Detected Data	0.00116	0.00162
Median of Detected Data	0.00116	0.00119
SD of Detected Data	6.364E-05	0.000889

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
R Value Adjusted for Ties in Data	90
K Value Adjusted for Ties in Data	89
Number of Site Observations in 'R' Largest	90

Non-Detect Values in the 'R' Largest - Cannot complete Quantile Test

	Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Vanadium, dissolved(site)

Background Data: Vanadium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	462	149
Number of Non-Detect Data	90	22
Number of Detect Data	372	127
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.012	0.0193
Percent Non detects	19.48%	14.77%
Minimum Detected	0.00096	0.00102
Maximum Detected	0.326	0.0803
Mean of Detected Data	0.0231	0.0162
Median of Detected Data	0.01	0.0131
SD of Detected Data	0.0379	0.0125

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7
Calculated Alpha	N/A

Conclusion with Alpha = 0.059

Reject H0, Conclude Site Concentration > Background Concentration

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Combined_chemical_data_	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Zinc, dissolved(site)

Background Data: Zinc, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	1049	143
Number of Non-Detect Data	324	49
Number of Detect Data	725	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.2	0.0162
Percent Non detects	30.89%	34.27%
Minimum Detected	0.0033	0.0106
Maximum Detected	1.5	0.137
Mean of Detected Data	0.0858	0.0388
Median of Detected Data	0.036	0.0281
SD of Detected Data	0.133	0.0283

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.059)	7
Approximate K Value (0.059)	6
Number of Site Observations in 'R' Largest	7
Calculated Alpha	N/A

Conclusion with Alpha = 0.059

Reject H0, Conclude Site Concentration > Background Concentration

ARCADIS

Site-Wide

Gehan Outputs

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Aluminum, dissolved(site)

Background Data: Aluminum, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	294	149
Number of Non-Detect Data	273	122
Number of Detect Data	21	27
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.52	0.101
Percent Non detects	92.86%	81.88%
Minimum Detected	0.0535	0.0509
Maximum Detected	0.749	0.164
Mean of Detected Data	0.122	0.0784
Median of Detected Data	0.0679	0.0616
SD of Detected Data	0.149	0.0327

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-3.193
Critical z (0.95)	1.645
P-Value	0.999

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Ammonia as nitrogen(site)

Background Data: Ammonia as nitrogen(background)

Raw Statistics

	Site	Background
Number of Valid Data	569	149
Number of Non-Detect Data	449	141
Number of Detect Data	120	8
Minimum Non-Detect	0.02	0.5
Maximum Non-Detect	1	0.5
Percent Non detects	78.91%	94.63%
Minimum Detected	0.062	0.586
Maximum Detected	180	1.06
Mean of Detected Data	3.624	0.751
Median of Detected Data	1	0.69
SD of Detected Data	16.5	0.178

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.183
Critical z (0.95)	1.645
P-Value	0.0007276

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Antimony, dissolved(site)

Background Data: Antimony, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	384	149
Number of Non-Detect Data	375	148
Number of Detect Data	9	1
Minimum Non-Detect	0.002	0.002
Maximum Non-Detect	0.02	0.002
Percent Non detects	97.66%	99.33%
Minimum Detected	0.0033	0.00232
Maximum Detected	0.155	0.00232
Mean of Detected Data	0.0482	0.00232
Median of Detected Data	0.0209	0.00232
SD of Detected Data	0.0611	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.691
Critical z (0.95)	1.645
P-Value	0.0454

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Arsenic, dissolved(site)

Background Data: Arsenic, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	460	132
Number of Non-Detect Data	270	3
Number of Detect Data	190	129
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.04	0.001
Percent Non detects	58.70%	2.27%
Minimum Detected	0.00105	0.00107
Maximum Detected	0.157	0.0191
Mean of Detected Data	0.013	0.00598
Median of Detected Data	0.00363	0.0054
SD of Detected Data	0.027	0.00389

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-7.133
Critical z (0.95)	1.645
P-Value	1

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Barium, dissolved(site)

Background Data: Barium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	559	149
Number of Non-Detect Data	198	0
Number of Detect Data	361	149
Minimum Non-Detect	0.001	N/A
Maximum Non-Detect	0.5	N/A
Percent Non detects	35.42%	0.00%
Minimum Detected	0.00917	0.0115
Maximum Detected	5.3	0.188
Mean of Detected Data	0.095	0.06
Median of Detected Data	0.0518	0.0488
SD of Detected Data	0.393	0.0381

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	0.514
Critical z (0.95)	1.645
P-Value	0.304

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Beryllium, dissolved(site)

Background Data: Beryllium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	374	149
Number of Non-Detect Data	354	148
Number of Detect Data	20	1
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.012	0.001
Percent Non detects	94.65%	99.33%
Minimum Detected	0.0011	0.00148
Maximum Detected	0.0088	0.00148
Mean of Detected Data	0.00226	0.00148
Median of Detected Data	0.00215	0.00148
SD of Detected Data	0.00164	N/A

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	3.202
Critical z (0.95)	1.645
P-Value	0.0006833

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Chloride(site)

Background Data: Chloride(background)

Raw Statistics

	Site	Background
Number of Valid Data	825	149
Number of Non-Detect Data	0	0
Number of Detect Data	825	149
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	18.9	24.4
Maximum Detected	22300	4070
Mean of Detected Data	2848	365.4
Median of Detected Data	2040	145
SD of Detected Data	3154	767.9

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	16.08
Critical z (0.95)	1.645
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Chromium, dissolved(site)

Background Data: Chromium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	2881	148
Number of Non-Detect Data	993	43
Number of Detect Data	1888	105
Minimum Non-Detect	0	0.001
Maximum Non-Detect	0.8	0.001
Percent Non detects	34.47%	29.05%
Minimum Detected	0.001	0.00104
Maximum Detected	16.4	0.0404
Mean of Detected Data	1.473	0.0121
Median of Detected Data	0.287	0.0106
SD of Detected Data	2.545	0.00906

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.096
Critical z (0.95)	1.645
P-Value	1.734E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Cobalt, dissolved(site)

Background Data: Cobalt, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	374	149
Number of Non-Detect Data	361	145
Number of Detect Data	13	4
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.012	0.001
Percent Non detects	96.52%	97.32%
Minimum Detected	0.00101	0.00101
Maximum Detected	0.01	0.00164
Mean of Detected Data	0.00216	0.00136
Median of Detected Data	0.00123	0.00139
SD of Detected Data	0.00258	0.0002611

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.282
Critical z (0.95)	1.645
P-Value	0.0112

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Copper, dissolved(site)

Background Data: Copper, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	1049	149
Number of Non-Detect Data	691	45
Number of Detect Data	358	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00325
Percent Non detects	65.87%	30.20%
Minimum Detected	0.00103	0.00101
Maximum Detected	0.306	0.0205
Mean of Detected Data	0.0119	0.00417
Median of Detected Data	0.0052	0.00318
SD of Detected Data	0.0265	0.00404

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.41
Critical z (0.95)	1.645
P-Value	5.162E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Fluoride(site)

Background Data: Fluoride(background)

Raw Statistics

	Site	Background
Number of Valid Data	491	143
Number of Non-Detect Data	65	25
Number of Detect Data	426	118
Minimum Non-Detect	0.1	0.5
Maximum Non-Detect	13.4	0.5
Percent Non detects	13.24%	17.48%
Minimum Detected	0.05	0.525
Maximum Detected	24.6	4.34
Mean of Detected Data	2.788	1.698
Median of Detected Data	2.3	1.525
SD of Detected Data	2.334	1.024

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	7.531
Critical z (0.95)	1.645
P-Value	2.526E-14

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Hexavalent chromium(site)

Background Data: Hexavalent chromium(background)

Raw Statistics

	Site	Background
Number of Valid Data	2780	148
Number of Non-Detect Data	1130	38
Number of Detect Data	1650	110
Minimum Non-Detect	0.0002	0.0002
Maximum Non-Detect	0.01	0.001
Percent Non detects	40.65%	25.68%
Minimum Detected	0.00024	0.00022
Maximum Detected	15.7	0.0376
Mean of Detected Data	1.641	0.0102
Median of Detected Data	0.46	0.00885
SD of Detected Data	2.572	0.00844

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	4.877
Critical z (0.95)	1.645
P-Value	5.383E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Iron, dissolved(site)

Background Data: Iron, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	684	147
Number of Non-Detect Data	532	121
Number of Detect Data	152	26
Minimum Non-Detect	0.02	0.1
Maximum Non-Detect	2.5	0.673
Percent Non detects	77.78%	82.31%
Minimum Detected	0.0245	0.104
Maximum Detected	21	5.07
Mean of Detected Data	2.707	1.216
Median of Detected Data	1.21	0.536
SD of Detected Data	3.773	1.434

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	1.95
Critical z (0.95)	1.645
P-Value	0.0256

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Lead, dissolved(site)

Background Data: Lead, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	474	147
Number of Non-Detect Data	412	125
Number of Detect Data	62	22
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.1	0.001
Percent Non detects	86.92%	85.03%
Minimum Detected	0.00083	0.00102
Maximum Detected	0.076	0.00409
Mean of Detected Data	0.00887	0.00199
Median of Detected Data	0.0035	0.00162
SD of Detected Data	0.016	0.0009179

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.066
Critical z (0.95)	1.645
P-Value	0.0194

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Molybdenum, dissolved(site)

Background Data: Molybdenum, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	563	149
Number of Non-Detect Data	35	1
Number of Detect Data	528	148
Minimum Non-Detect	0.002	0.00758
Maximum Non-Detect	0.05	0.00758
Percent Non detects	6.22%	0.67%
Minimum Detected	0.00085	0.0035
Maximum Detected	0.301	0.0417
Mean of Detected Data	0.0308	0.0113
Median of Detected Data	0.0218	0.00866
SD of Detected Data	0.0302	0.00752

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	10.52
Critical z (0.95)	1.645
P-Value	3.521E-26

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nickel, dissolved(site)

Background Data: Nickel, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	1049	149
Number of Non-Detect Data	570	96
Number of Detect Data	479	53
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.4	0.00628
Percent Non detects	54.34%	64.43%
Minimum Detected	0.00069	0.001
Maximum Detected	0.5	0.0415
Mean of Detected Data	0.0132	0.0042
Median of Detected Data	0.005	0.00202
SD of Detected Data	0.0392	0.00635

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	11.7
Critical z (0.95)	1.645
P-Value	6.216E-32

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_nitrate_data_final_inp	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Nitrate as Nitrogen(site)

Background Data: Nitrate as Nitrogen(background)

Raw Statistics

	Site	Background
Number of Valid Data	844	148
Number of Non-Detect Data	271	30
Number of Detect Data	573	118
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	200	0.5
Percent Non detects	32.11%	20.27%
Minimum Detected	0.107	0.687
Maximum Detected	31.8	4.75
Mean of Detected Data	4.522	2.587
Median of Detected Data	2.99	2.52
SD of Detected Data	4.781	0.984

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.776
Critical z (0.95)	1.645
P-Value	0.781

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Selenium, dissolved(site)

Background Data: Selenium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	396	149
Number of Non-Detect Data	228	45
Number of Detect Data	168	104
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.04	0.001
Percent Non detects	57.58%	30.20%
Minimum Detected	0.00103	0.001
Maximum Detected	0.155	0.0136
Mean of Detected Data	0.00953	0.0029
Median of Detected Data	0.00527	0.00199
SD of Detected Data	0.0177	0.0027

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	5.439
Critical z (0.95)	1.645
P-Value	2.675E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Silver, dissolved(site)

Background Data: Silver, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	374	149
Number of Non-Detect Data	366	141
Number of Detect Data	8	8
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.05	0.001
Percent Non detects	97.86%	94.63%
Minimum Detected	0.0059	0.00108
Maximum Detected	0.0873	0.0103
Mean of Detected Data	0.0376	0.00401
Median of Detected Data	0.0302	0.0036
SD of Detected Data	0.0307	0.00315

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-0.773
Critical z (0.95)	1.645
P-Value	0.78

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Thallium, dissolved(site)

Background Data: Thallium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	374	149
Number of Non-Detect Data	372	145
Number of Detect Data	2	4
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.06	0.001
Percent Non detects	99.47%	97.32%
Minimum Detected	0.00111	0.00114
Maximum Detected	0.0012	0.00295
Mean of Detected Data	0.00116	0.00162
Median of Detected Data	0.00116	0.00119
SD of Detected Data	6.364E-05	0.000889

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-1.635
Critical z (0.95)	1.645
P-Value	0.949

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

	Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects	
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium, dissolved(site)

Background Data: Vanadium, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	462	149
Number of Non-Detect Data	90	22
Number of Detect Data	372	127
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.012	0.0193
Percent Non detects	19.48%	14.77%
Minimum Detected	0.00096	0.00102
Maximum Detected	0.326	0.0803
Mean of Detected Data	0.0231	0.0162
Median of Detected Data	0.01	0.0131
SD of Detected Data	0.0379	0.0125

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	-2.18
Critical z (0.95)	1.645
P-Value	0.985

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\GW_chemical_data_final_i	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Zinc, dissolved(site)

Background Data: Zinc, dissolved(background)

Raw Statistics

	Site	Background
Number of Valid Data	1049	143
Number of Non-Detect Data	324	49
Number of Detect Data	725	94
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.2	0.0162
Percent Non detects	30.89%	34.27%
Minimum Detected	0.0033	0.0106
Maximum Detected	1.5	0.137
Mean of Detected Data	0.0858	0.0388
Median of Detected Data	0.036	0.0281
SD of Detected Data	0.133	0.0283

Site vs Background Gehan Test

H0: Mean/Median of Site or AOC <= Mean/Median of background

Gehan z Test Value	2.448
Critical z (0.95)	1.645
P-Value	0.00719

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

ARCADIS

Floodplain

ProUCL Outputs

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Alkalinity, bicarb as CaCO3 (downstream)

General Statistics

Number of Valid Observations	49	Number of Distinct Observations	21

Raw Statistics		**Log-transformed Statistics**	
Minimum	110	Minimum of Log Data	4.7
Maximum	167	Maximum of Log Data	5.118
Mean	134.5	Mean of log Data	4.898
Median	132	SD of log Data	0.083
SD	11.56		
Coefficient of Variation	0.0859		
Skewness	1.132		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.897	Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	137.2	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	141.4
95% Adjusted-CLT UCL	137.5	97.5% Chebyshev (MVUE) UCL	144.4
95% Modified-t UCL	137.3	99% Chebyshev (MVUE) UCL	150.4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	136.2	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.987		
nu star	13352		
Approximate Chi Square Value (.05)	13084	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0451	95% CLT UCL	137.2
Adjusted Chi Square Value	13076	95% Jackknife UCL	137.2
		95% Standard Bootstrap UCL	137.2
Anderson-Darling Test Statistic	1.388	95% Bootstrap-t UCL	137.4
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	137.8
Kolmogorov-Smirnov Test Statistic	0.154	95% Percentile Bootstrap UCL	137.2
Kolmogorov-Smirnov 5% Critical Value	0.126	95% BCA Bootstrap UCL	137.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	141.7
		97.5% Chebyshev(Mean, Sd) UCL	144.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	150.9
95% Approximate Gamma UCL	137.2		
95% Adjusted Gamma UCL	137.3		
Potential UCL to Use		Use 95% Student's-t UCL	137.2

	or 95% Modified-t UCL	137.3

Alkalinity, bicarb as CaCO3 (other)

General Statistics

Number of Valid Observations	2	Number of Distinct Observations	2

Warning: This data set only has 2 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Alkalinity, bicarb as CaCO3 (other) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Alkalinity, bicarb as CaCO3 (upstream)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	5

Raw Statistics		**Log-transformed Statistics**	
Minimum	128	Minimum of Log Data	4.852
Maximum	167	Maximum of Log Data	5.118
Mean	137.8	Mean of log Data	4.922
Median	131	SD of log Data	0.101
SD	14.89		
Coefficient of Variation	0.108		
Skewness	2.063		

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.71	Shapiro Wilk Test Statistic	0.729
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	150.1	95% H-UCL	150.6

107	**95% UCLs (Adjusted for Skewness)**									95% Chebyshev (MVUE) UCL	162.6
108	95% Adjusted-CLT UCL	153.3								97.5% Chebyshev (MVUE) UCL	173.3
109	95% Modified-t UCL	150.9								99% Chebyshev (MVUE) UCL	194.4
110											
111	**Gamma Distribution Test**									**Data Distribution**	
112	k star (bias corrected)	56.3								**Data Follow Appr. Gamma Distribution at 5% Significance Level**	
113	Theta Star	2.448									
114	nu star	675.6									
115	Approximate Chi Square Value (.05)	616.3								**Nonparametric Statistics**	
116	Adjusted Level of Significance	0.0122								95% CLT UCL	147.8
117	Adjusted Chi Square Value	595.6								95% Jackknife UCL	150.1
118										95% Standard Bootstrap UCL	147.2
119	Anderson-Darling Test Statistic	0.877								95% Bootstrap-t UCL	212
120	Anderson-Darling 5% Critical Value	0.696								95% Hall's Bootstrap UCL	203.1
121	Kolmogorov-Smirnov Test Statistic	0.331								95% Percentile Bootstrap UCL	148.2
122	Kolmogorov-Smirnov 5% Critical Value	0.332								95% BCA Bootstrap UCL	150.2
123	**Data follow Appr. Gamma Distribution at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL	164.3
124										97.5% Chebyshev(Mean, Sd) UCL	175.8
125	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL	198.3
126	95% Approximate Gamma UCL	151.1									
127	95% Adjusted Gamma UCL	156.3									
128											
129	**Potential UCL to Use**									Use 95% Approximate Gamma UCL	151.1
130											

1				**General UCL Statistics for Data Sets with Non-Detects**								
2		**User Selected Options**										
3			From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	**Ammonia as nitrogen (downstream)**											
10												
11						**General Statistics**							
12						Number of Valid Data	17			Number of Detected Data		4
13						Number of Distinct Detected Data	3			Number of Non-Detect Data		13
14										Percent Non-Detects		76.47%
15												
16						**Raw Statistics**				**Log-transformed Statistics**		
17						Minimum Detected	0.1			Minimum Detected		-2.303
18						Maximum Detected	0.3			Maximum Detected		-1.204
19						Mean of Detected	0.225			Mean of Detected		-1.58
20						SD of Detected	0.0957			SD of Detected		0.518
21						Minimum Non-Detect	0.1			Minimum Non-Detect		-2.303
22						Maximum Non-Detect	0.5			Maximum Non-Detect		-0.693
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		17
25	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
26	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
27												
28	**Warning: There are only 3 Distinct Detected Values in this data set**											
29	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
30	**Those methods will return a 'N/A' value on your output display!**											
31												
32	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
33	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
34												
35												
36						**UCL Statistics**							
37						**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**		
38						Shapiro Wilk Test Statistic	0.865			Shapiro Wilk Test Statistic		0.841
39						5% Shapiro Wilk Critical Value	0.748			5% Shapiro Wilk Critical Value		0.748
40						**Data appear Normal at 5% Significance Level**				**Data appear Lognormal at 5% Significance Level**		
41												
42						**Assuming Normal Distribution**				**Assuming Lognormal Distribution**		
43						DL/2 Substitution Method				DL/2 Substitution Method		
44						Mean	0.2			Mean		-1.77
45						SD	0.0901			SD		0.665
46						95% DL/2 (t) UCL	0.238			95% H-Stat (DL/2) UCL		0.316
47												
48						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
49						**MLE method failed to converge properly**				Mean in Log Scale		-2.26
50										SD in Log Scale		0.774
51										Mean in Original Scale		0.137
52										SD in Original Scale		0.103
53										95% Percentile Bootstrap UCL		0.179

54											95% BCA Bootstrap UCL	0.181
55												
56	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
57					k star (bias corrected)	1.622	**Data appear Normal at 5% Significance Level**					
58					Theta Star	0.139						
59					nu star	12.98						
60												
61					A-D Test Statistic	0.449	**Nonparametric Statistics**					
62					5% A-D Critical Value	0.659	Kaplan-Meier (KM) Method					
63					K-S Test Statistic	0.659	Mean	0.163				
64					5% K-S Critical Value	0.396	SD	0.0857				
65	**Data appear Gamma Distributed at 5% Significance Level**						SE of Mean	0.035				
66							95% KM (t) UCL	0.224				
67	**Assuming Gamma Distribution**						95% KM (z) UCL	0.22				
68	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.232				
69					Minimum	0.1	95% KM (bootstrap t) UCL	0.207				
70					Maximum	0.462	95% KM (BCA) UCL	0.3				
71					Mean	0.261	95% KM (Percentile Bootstrap) UCL	0.3				
72					Median	0.25	95% KM (Chebyshev) UCL	0.315				
73					SD	0.107	97.5% KM (Chebyshev) UCL	0.381				
74					k star	4.78	99% KM (Chebyshev) UCL	0.511				
75					Theta star	0.0545						
76					Nu star	162.5	**Potential UCLs to Use**					
77					AppChi2	134	95% KM (t) UCL	0.224				
78					95% Gamma Approximate UCL	0.316	95% KM (Percentile Bootstrap) UCL	0.3				
79					95% Adjusted Gamma UCL	N/A						
80	**Note: DL/2 is not a recommended method.**											
81												
82												
83	**Ammonia as nitrogen (upstream)**											
84												
85	**General Statistics**											
86					Number of Valid Data	6	Number of Detected Data	3				
87					Number of Distinct Detected Data	3	Number of Non-Detect Data	3				
88							Percent Non-Detects	50.00%				
89												
90	**Raw Statistics**						**Log-transformed Statistics**					
91					Minimum Detected	0.06	Minimum Detected	-2.813				
92					Maximum Detected	0.2	Maximum Detected	-1.609				
93					Mean of Detected	0.12	Mean of Detected	-2.242				
94					SD of Detected	0.0721	SD of Detected	0.604				
95					Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303				
96					Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693				
97												
98	Note: Data have multiple DLs - Use of KM Method is recommended						Number treated as Non-Detect	6				
99	For all methods (except KM, DL/2, and ROS Methods),						Number treated as Detected	0				
100	Observations < Largest ND are treated as NDs						Single DL Non-Detect Percentage	100.00%				
101												
102	**Warning: There are only 3 Distinct Detected Values in this data set**											
103	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
104	**Those methods will return a 'N/A' value on your output display!**											
105												
106	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											

	A	B	C	D	E	F	G	H	I	J	K	L
107	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
108												
109												
110	**UCL Statistics**											
111	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
112	Shapiro Wilk Test Statistic					0.942	Shapiro Wilk Test Statistic					0.992
113	5% Shapiro Wilk Critical Value					0.767	5% Shapiro Wilk Critical Value					0.767
114	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
115												
116	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
117	DL/2 Substitution Method						DL/2 Substitution Method					
118	Mean					0.127	Mean					-2.235
119	SD					0.0804	SD					0.638
120	95% DL/2 (t) UCL					0.193	95% H-Stat (DL/2) UCL					0.202
121												
122	Maximum Likelihood Estimate(MLE) Method					N/A	Log ROS Method					
123	**MLE method failed to converge properly**						Mean in Log Scale					-2.447
124							SD in Log Scale					0.46
125							Mean in Original Scale					0.0957
126							SD in Original Scale					0.0535
127							95% Percentile Bootstrap UCL					0.136
128							95% BCA Bootstrap UCL					0.145
129												
130	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
131	k star (bias corrected)					N/A	**Data appear Normal at 5% Significance Level**					
132	Theta Star					N/A						
133	nu star					N/A						
134												
135	A-D Test Statistic					0.273	**Nonparametric Statistics**					
136	5% A-D Critical Value					N/A	Kaplan-Meier (KM) Method					
137	K-S Test Statistic					N/A	Mean					0.0987
138	5% K-S Critical Value					N/A	SD					0.0534
139	**Data not Gamma Distributed at 5% Significance Level**						SE of Mean					0.0297
140							95% KM (t) UCL					0.159
141	**Assuming Gamma Distribution**						95% KM (z) UCL					0.148
142	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					0.157
143	Minimum					N/A	95% KM (bootstrap t) UCL					0.184
144	Maximum					N/A	95% KM (BCA) UCL					0.2
145	Mean					N/A	95% KM (Percentile Bootstrap) UCL					0.2
146	Median					N/A	95% KM (Chebyshev) UCL					0.228
147	SD					N/A	97.5% KM (Chebyshev) UCL					0.284
148	k star					N/A	99% KM (Chebyshev) UCL					0.394
149	Theta star					N/A						
150	Nu star					N/A	**Potential UCLs to Use**					
151	AppChi2					N/A	95% KM (t) UCL					0.159
152	95% Gamma Approximate UCL					N/A	95% KM (Percentile Bootstrap) UCL					0.2
153	95% Adjusted Gamma UCL					N/A						
154	**Note: DL/2 is not a recommended method.**											
155												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Barium, dissolved (downstream)

General Statistics

Number of Valid Data	9	Number of Detected Data	6
Number of Distinct Detected Data	3	Number of Non-Detect Data	3
		Percent Non-Detects	33.33%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.11	Minimum Detected	-2.207
Maximum Detected	0.17	Maximum Detected	-1.772
Mean of Detected	0.123	Mean of Detected	-2.106
SD of Detected	0.0234	SD of Detected	0.169
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.654	Shapiro Wilk Test Statistic	0.682
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.166	Mean	-1.866
SD	0.066	SD	0.384
95% DL/2 (t) UCL	0.206	95% H-Stat (DL/2) UCL	0.433
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-2.106
		SD in Log Scale	0.146
		Mean in Original Scale	0.123
		SD in Original Scale	0.0199
		95% Percentile Bootstrap UCL	0.135
		95% BCA Bootstrap UCL	0.137
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	

54				k star (bias corrected)	19.64	**Data do not follow a Discernable Distribution (0.05)**						
55				Theta Star	0.00628							
56				nu star	235.7							
57												
58				A-D Test Statistic	1.018	**Nonparametric Statistics**						
59				5% A-D Critical Value	0.697					Kaplan-Meier (KM) Method		
60				K-S Test Statistic	0.697					Mean		0.123
61				5% K-S Critical Value	0.332					SD		0.0213
62	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean		0.00955
63										95% KM (t) UCL		0.141
64	**Assuming Gamma Distribution**									95% KM (z) UCL		0.139
65				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.142
66				Minimum	0.11					95% KM (bootstrap t) UCL		0.19
67				Maximum	0.17					95% KM (BCA) UCL		0.14
68				Mean	0.124					95% KM (Percentile Bootstrap) UCL		0.14
69				Median	0.12					95% KM (Chebyshev) UCL		0.165
70				SD	0.0198					97.5% KM (Chebyshev) UCL		0.183
71				k star	33.48					99% KM (Chebyshev) UCL		0.218
72				Theta star	0.00369							
73				Nu star	602.6	**Potential UCLs to Use**						
74				AppChi2	546.7					95% KM (BCA) UCL		0.14
75				95% Gamma Approximate UCL	0.136							
76				95% Adjusted Gamma UCL	0.139							
77	**Note: DL/2 is not a recommended method.**											
78												
79												
80	**Barium, dissolved (upstream)**											
81												
82	**General Statistics**											
83				Number of Valid Data	6					Number of Detected Data		5
84				Number of Distinct Detected Data	3					Number of Non-Detect Data		1
85										Percent Non-Detects		16.67%
86												
87	**Raw Statistics**					**Log-transformed Statistics**						
88				Minimum Detected	0.1					Minimum Detected		-2.303
89				Maximum Detected	0.14					Maximum Detected		-1.966
90				Mean of Detected	0.114					Mean of Detected		-2.178
91				SD of Detected	0.0152					SD of Detected		0.125
92				Minimum Non-Detect	0.5					Minimum Non-Detect		-0.693
93				Maximum Non-Detect	0.5					Maximum Non-Detect		-0.693
94												
95												
96	**Warning: There are only 3 Distinct Detected Values in this data set**											
97	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
98	**Those methods will return a 'N/A' value on your output display!**											
99												
100	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
101	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
102												
103												
104	**UCL Statistics**											
105	**Normal Distribution Test with Detected Values Only**					**Lognormal Distribution Test with Detected Values Only**						
106				Shapiro Wilk Test Statistic	0.768					Shapiro Wilk Test Statistic		0.794

107				5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
108	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
109												
110	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
111				DL/2 Substitution Method						DL/2 Substitution Method		
112				Mean	0.137					Mean	-2.046	
113				SD	0.0572					SD	0.342	
114				95% DL/2 (t) UCL	0.184					95% H-Stat (DL/2) UCL	0.427	
115												
116				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		
117	**MLE method failed to converge properly**									Mean in Log Scale	-2.178	
118										SD in Log Scale	0.112	
119										Mean in Original Scale	0.114	
120										SD in Original Scale	0.0136	
121										95% Percentile Bootstrap UCL	0.124	
122										95% BCA Bootstrap UCL	0.125	
123												
124	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
125				k star (bias corrected)	30.74		**Data appear Normal at 5% Significance Level**					
126				Theta Star	0.00371							
127				nu star	307.4							
128												
129				A-D Test Statistic	0.727		**Nonparametric Statistics**					
130				5% A-D Critical Value	0.678					Kaplan-Meier (KM) Method		
131				K-S Test Statistic	0.678					Mean	0.114	
132				5% K-S Critical Value	0.357					SD	0.0136	
133	**Data not Gamma Distributed at 5% Significance Level**									SE of Mean	0.00678	
134										95% KM (t) UCL	0.128	
135	**Assuming Gamma Distribution**									95% KM (z) UCL	0.125	
136				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.128	
137				Minimum	0.1					95% KM (bootstrap t) UCL	1.8E+308	
138				Maximum	0.14					95% KM (BCA) UCL	0.123	
139				Mean	0.114					95% KM (Percentile Bootstrap) UCL	0.125	
140				Median	0.11					95% KM (Chebyshev) UCL	0.144	
141				SD	0.0136					97.5% KM (Chebyshev) UCL	0.156	
142				k star	45.86					99% KM (Chebyshev) UCL	0.181	
143				Theta star	0.00249							
144				Nu star	550.3		**Potential UCLs to Use**					
145				AppChi2	496.9					95% KM (t) UCL	0.128	
146				95% Gamma Approximate UCL	0.127					95% KM (Percentile Bootstrap) UCL	0.125	
147				95% Adjusted Gamma UCL	0.131							
148	**Note: DL/2 is not a recommended method.**											
149												

1				**General UCL Statistics for Data Sets with Non-Detects**								
2	**User Selected Options**											
3	From File			\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	**Calcium, dissolved (downstream)**											
10												
11	**General Statistics**											
12	Number of Valid Observations			39		Number of Distinct Observations					37	
13												
14	**Raw Statistics**					**Log-transformed Statistics**						
15	Minimum			66		Minimum of Log Data					4.19	
16	Maximum			101		Maximum of Log Data					4.615	
17	Mean			80.54		Mean of log Data					4.385	
18	Median			79.9		SD of log Data					0.0914	
19	SD			7.454								
20	Coefficient of Variation			0.0926								
21	Skewness			0.531								
22												
23	**Relevant UCL Statistics**											
24	**Normal Distribution Test**					**Lognormal Distribution Test**						
25	Shapiro Wilk Test Statistic			0.958		Shapiro Wilk Test Statistic					0.971	
26	Shapiro Wilk Critical Value			0.939		Shapiro Wilk Critical Value					0.939	
27	**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**						
28												
29	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
30	95% Student's-t UCL			82.55		95% H-UCL					N/A	
31	**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL					85.68	
32	95% Adjusted-CLT UCL			82.61		97.5% Chebyshev (MVUE) UCL					87.91	
33	95% Modified-t UCL			82.57		99% Chebyshev (MVUE) UCL					92.29	
34												
35	**Gamma Distribution Test**					**Data Distribution**						
36	k star (bias corrected)			112.8		**Data appear Normal at 5% Significance Level**						
37	Theta Star			0.714								
38	nu star			8795								
39	Approximate Chi Square Value (.05)			8578		**Nonparametric Statistics**						
40	Adjusted Level of Significance			0.0437		95% CLT UCL					82.5	
41	Adjusted Chi Square Value			8569		95% Jackknife UCL					82.55	
42						95% Standard Bootstrap UCL					82.49	
43	Anderson-Darling Test Statistic			0.405		95% Bootstrap-t UCL					82.66	
44	Anderson-Darling 5% Critical Value			0.747		95% Hall's Bootstrap UCL					82.72	
45	Kolmogorov-Smirnov Test Statistic			0.0987		95% Percentile Bootstrap UCL					82.49	
46	Kolmogorov-Smirnov 5% Critical Value			0.141		95% BCA Bootstrap UCL					82.49	
47	**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL					85.74	
48						97.5% Chebyshev(Mean, Sd) UCL					87.99	
49	**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL					92.41	
50	95% Approximate Gamma UCL			82.58								
51	95% Adjusted Gamma UCL			82.66								
52												
53	**Potential UCL to Use**					Use 95% Student's-t UCL					82.55	

Calcium, dissolved (upstream)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	5

Raw Statistics		**Log-transformed Statistics**	
Minimum	68.7	Minimum of Log Data	4.23
Maximum	92.7	Maximum of Log Data	4.529
Mean	74.6	Mean of log Data	4.306
Median	70.1	SD of log Data	0.117
SD	9.381		
Coefficient of Variation	0.126		
Skewness	1.955		

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.71	Shapiro Wilk Test Statistic	0.728
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	82.32	95% H-UCL	82.74
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	90.12
95% Adjusted-CLT UCL	84.17	97.5% Chebyshev (MVUE) UCL	96.85
95% Modified-t UCL	82.83	99% Chebyshev (MVUE) UCL	110.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	41.9	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	1.781		
nu star	502.8		
Approximate Chi Square Value (.05)	451.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	80.9
Adjusted Chi Square Value	434.1	95% Jackknife UCL	82.32
		95% Standard Bootstrap UCL	80.37
Anderson-Darling Test Statistic	0.884	95% Bootstrap-t UCL	146.4
Anderson-Darling 5% Critical Value	0.696	95% Hall's Bootstrap UCL	127.4
Kolmogorov-Smirnov Test Statistic	0.367	95% Percentile Bootstrap UCL	81.03
Kolmogorov-Smirnov 5% Critical Value	0.332	95% BCA Bootstrap UCL	82.37

	A	B	C	D	E	F	G	H	I	J	K	L
107	**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					91.29
108							97.5% Chebyshev(Mean, Sd) UCL					98.52
109	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					112.7
110	95% Approximate Gamma UCL					83.02						
111	95% Adjusted Gamma UCL					86.39						
112												
113	**Potential UCL to Use**						Use 95% Student's-t UCL					82.32
114							or 95% Modified-t UCL					82.83
115												

1				**General UCL Statistics for Data Sets with Non-Detects**								
2	**User Selected Options**											
3	From File			\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	**Chloride (downstream)**											
10												
11	**General Statistics**											
12	Number of Valid Observations			39			Number of Distinct Observations				34	
13												
14	**Raw Statistics**						**Log-transformed Statistics**					
15	Minimum			74			Minimum of Log Data				4.304	
16	Maximum			106			Maximum of Log Data				4.663	
17	Mean			88.47			Mean of log Data				4.48	
18	Median			88.4			SD of log Data				0.0763	
19	SD			6.771								
20	Coefficient of Variation			0.0765								
21	Skewness			0.301								
22												
23	**Relevant UCL Statistics**											
24	**Normal Distribution Test**						**Lognormal Distribution Test**					
25	Shapiro Wilk Test Statistic			0.978			Shapiro Wilk Test Statistic				0.983	
26	Shapiro Wilk Critical Value			0.939			Shapiro Wilk Critical Value				0.939	
27	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
28												
29	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
30	95% Student's-t UCL			90.3			95% H-UCL				N/A	
31	**95% UCLs (Adjusted for Skewness)**						95% Chebyshev (MVUE) UCL				93.19	
32	95% Adjusted-CLT UCL			90.31			97.5% Chebyshev (MVUE) UCL				95.23	
33	95% Modified-t UCL			90.31			99% Chebyshev (MVUE) UCL				99.24	
34												
35	**Gamma Distribution Test**						**Data Distribution**					
36	k star (bias corrected)			162.8			**Data appear Normal at 5% Significance Level**					
37	Theta Star			0.543								
38	nu star			12699								
39	Approximate Chi Square Value (.05)			12438			**Nonparametric Statistics**					
40	Adjusted Level of Significance			0.0437			95% CLT UCL				90.26	
41	Adjusted Chi Square Value			12428			95% Jackknife UCL				90.3	
42							95% Standard Bootstrap UCL				90.22	
43	Anderson-Darling Test Statistic			0.265			95% Bootstrap-t UCL				90.35	
44	Anderson-Darling 5% Critical Value			0.747			95% Hall's Bootstrap UCL				90.35	
45	Kolmogorov-Smirnov Test Statistic			0.084			95% Percentile Bootstrap UCL				90.28	
46	Kolmogorov-Smirnov 5% Critical Value			0.141			95% BCA Bootstrap UCL				90.35	
47	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL				93.2	
48							97.5% Chebyshev(Mean, Sd) UCL				95.25	
49	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL				99.26	
50	95% Approximate Gamma UCL			90.33								
51	95% Adjusted Gamma UCL			90.4								
52												
53	**Potential UCL to Use**						Use 95% Student's-t UCL				90.3	

	A	B	C	D	E	F	G	H	I	J	K	L
54												
55												
56	**Chloride (upstream)**											
57												
58						**General Statistics**							
59						Number of Valid Observations	6				Number of Distinct Observations	5
60												
61						**Raw Statistics**					**Log-transformed Statistics**	
62						Minimum	72				Minimum of Log Data	4.277
63						Maximum	84				Maximum of Log Data	4.431
64						Mean	78.45				Mean of log Data	4.361
65						Median	80.35				SD of log Data	0.0672
66						SD	5.19					
67						Coefficient of Variation	0.0662					
68						Skewness	-0.649					
69												
70												
71						**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**						
72												
73						**It is suggested to collect at least 8 to 10 observations using these statistical methods!**						
74						**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**						
75												
76												
77						**Warning: There are only 6 Values in this data**						
78						**Note: It should be noted that even though bootstrap methods may be performed on this data set,**						
79						**the resulting calculations may not be reliable enough to draw conclusions**						
80												
81						**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**						
82												
83						**Relevant UCL Statistics**						
84						**Normal Distribution Test**					**Lognormal Distribution Test**	
85						Shapiro Wilk Test Statistic	0.84				Shapiro Wilk Test Statistic	0.831
86						Shapiro Wilk Critical Value	0.788				Shapiro Wilk Critical Value	0.788
87						**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**	
88												
89						**Assuming Normal Distribution**					**Assuming Lognormal Distribution**	
90						95% Student's-t UCL	82.72				95% H-UCL	N/A
91						**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL	87.84
92						95% Adjusted-CLT UCL	81.34				97.5% Chebyshev (MVUE) UCL	91.9
93						95% Modified-t UCL	82.63				99% Chebyshev (MVUE) UCL	99.88
94												
95						**Gamma Distribution Test**					**Data Distribution**	
96						k star (bias corrected)	134.3				**Data appear Normal at 5% Significance Level**	
97						Theta Star	0.584					
98						nu star	1612					
99						Approximate Chi Square Value (.05)	1520				**Nonparametric Statistics**	
100						Adjusted Level of Significance	0.0122				95% CLT UCL	81.94
101						Adjusted Chi Square Value	1487				95% Jackknife UCL	82.72
102											95% Standard Bootstrap UCL	81.6
103						Anderson-Darling Test Statistic	0.593				95% Bootstrap-t UCL	81.92
104						Anderson-Darling 5% Critical Value	0.696				95% Hall's Bootstrap UCL	80.58
105						Kolmogorov-Smirnov Test Statistic	0.277				95% Percentile Bootstrap UCL	81.45
106						Kolmogorov-Smirnov 5% Critical Value	0.332				95% BCA Bootstrap UCL	81.28

	A	B	C	D	E	F	G	H	I	J	K	L
107	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					87.69
108							97.5% Chebyshev(Mean, Sd) UCL					91.68
109	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					99.53
110	95% Approximate Gamma UCL					83.21						
111	95% Adjusted Gamma UCL					85.05						
112												
113	**Potential UCL to Use**						Use 95% Student's-t UCL					82.72
114												

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Chromium, dissolved (downstream)											
10												
11	General Statistics											
12	Number of Valid Data			555		Number of Detected Data			35			
13	Number of Distinct Detected Data			30		Number of Non-Detect Data			520			
14						Percent Non-Detects			93.69%			
15												
16	Raw Statistics					Log-transformed Statistics						
17	Minimum Detected			0.0011		Minimum Detected			-6.812			
18	Maximum Detected			0.031		Maximum Detected			-3.474			
19	Mean of Detected			0.00775		Mean of Detected			-5.155			
20	SD of Detected			0.0063		SD of Detected			0.802			
21	Minimum Non-Detect			0.001		Minimum Non-Detect			-6.908			
22	Maximum Non-Detect			0.2		Maximum Non-Detect			-1.609			
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect			555			
25	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected			0			
26	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage			100.00%			
27												
28	UCL Statistics											
29	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
30	Lilliefors Test Statistic			0.828		Lilliefors Test Statistic			0.971			
31	5% Lilliefors Critical Value			0.934		5% Lilliefors Critical Value			0.934			
32	Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level						
33												
34	Assuming Normal Distribution					Assuming Lognormal Distribution						
35	DL/2 Substitution Method					DL/2 Substitution Method						
36	Mean			0.0025		Mean			-7.004			
37	SD			0.0057		SD			1.185			
38	95% DL/2 (t) UCL			0.0029		95% H-Stat (DL/2) UCL			0.00196			
39												
40	Maximum Likelihood Estimate(MLE) Method			N/A		Log ROS Method						
41	MLE method failed to converge properly					Mean in Log Scale			-8.769			
42						SD in Log Scale			1.881			
43						Mean in Original Scale			0.0008457			
44						SD in Original Scale			0.00248			
45						95% Percentile Bootstrap UCL			0.00102			
46						95% BCA Bootstrap UCL			0.00105			
47												
48	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
49	k star (bias corrected)			1.708		Data appear Gamma Distributed at 5% Significance Level						
50	Theta Star			0.00454								
51	nu star			119.5								
52												
53	A-D Test Statistic			0.475		Nonparametric Statistics						

54				5% A-D Critical Value	0.762				Kaplan-Meier (KM) Method			
55				K-S Test Statistic	0.762				Mean			0.00158
56				5% K-S Critical Value	0.151				SD			0.00237
57				**Data appear Gamma Distributed at 5% Significance Level**					SE of Mean			0.000108
58									95% KM (t) UCL			0.00176
59				**Assuming Gamma Distribution**					95% KM (z) UCL			0.00176
60				Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL			0.00176
61				Minimum	1E-09				95% KM (bootstrap t) UCL			0.00178
62				Maximum	0.0905				95% KM (BCA) UCL			0.00223
63				Mean	0.0502				95% KM (Percentile Bootstrap) UCL			0.00211
64				Median	0.054				95% KM (Chebyshev) UCL			0.00205
65				SD	0.0251				97.5% KM (Chebyshev) UCL			0.00226
66				k star	1.664				99% KM (Chebyshev) UCL			0.00266
67				Theta star	0.0302							
68				Nu star	1847				**Potential UCLs to Use**			
69				AppChi2	1748				95% KM (t) UCL			0.00176
70				95% Gamma Approximate UCL	0.0531							
71				95% Adjusted Gamma UCL	0.0531							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Chromium, dissolved (other)**											
76												
77					**General Statistics**							
78				Number of Valid Data	26				Number of Detected Data			0
79				Number of Distinct Detected Data	0				Number of Non-Detect Data			26
80									Percent Non-Detects			100.00%
81												
82				**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**								
83				**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**								
84				**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**								
85												
86				**The data set for variable Chromium, dissolved (other) was not processed!**								
87												
88												
89												
90	**Chromium, dissolved (upstream)**											
91												
92					**General Statistics**							
93				Number of Valid Data	424				Number of Detected Data			8
94				Number of Distinct Detected Data	8				Number of Non-Detect Data			416
95									Percent Non-Detects			98.11%
96												
97				**Raw Statistics**					**Log-transformed Statistics**			
98				Minimum Detected	0.003				Minimum Detected			-5.809
99				Maximum Detected	0.0133				Maximum Detected			-4.32
100				Mean of Detected	0.00645				Mean of Detected			-5.155
101				SD of Detected	0.00334				SD of Detected			0.505
102				Minimum Non-Detect	0.001				Minimum Non-Detect			-6.908
103				Maximum Non-Detect	0.02				Maximum Non-Detect			-3.912
104												
105	Note: Data have multiple DLs - Use of KM Method is recommended								Number treated as Non-Detect			424
106	For all methods (except KM, DL/2, and ROS Methods),								Number treated as Detected			0

107	Observations < Largest ND are treated as NDs								Single DL Non-Detect Percentage			100.00%
108												
109	**Warning: There are only 8 Detected Values in this data**											
110	**Note: It should be noted that even though bootstrap may be performed on this data set**											
111	**the resulting calculations may not be reliable enough tp draw conclusions**											
112												
113	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
114												
115												
116	**UCL Statistics**											
117	**Normal Distribution Test with Detected Values Only**								**Lognormal Distribution Test with Detected Values Only**			
118	Lilliefors Test Statistic					0.874			Lilliefors Test Statistic			0.93
119	5% Lilliefors Critical Value					0.818			5% Lilliefors Critical Value			0.818
120	**Data appear Normal at 5% Significance Level**								**Data appear Lognormal at 5% Significance Level**			
121												
122	**Assuming Normal Distribution**								**Assuming Lognormal Distribution**			
123	DL/2 Substitution Method								DL/2 Substitution Method			
124	Mean					0.0011			Mean			-7.398
125	SD					0.00224			SD			0.733
126	95% DL/2 (t) UCL					0.00128			95% H-Stat (DL/2) UCL			0.0008352
127												
128	Maximum Likelihood Estimate(MLE) Method					N/A			Log ROS Method			
129	**MLE method failed to converge properly**								Mean in Log Scale			-8.905
130									SD in Log Scale			1.535
131									Mean in Original Scale			0.0004333
132									SD in Original Scale			0.00105
133									95% Percentile Bootstrap UCL			0.0005219
134									95% BCA Bootstrap UCL			0.000537
135												
136	**Gamma Distribution Test with Detected Values Only**								**Data Distribution Test with Detected Values Only**			
137	k star (bias corrected)					2.985			**Data appear Normal at 5% Significance Level**			
138	Theta Star					0.00216						
139	nu star					47.76						
140												
141	A-D Test Statistic					0.356			**Nonparametric Statistics**			
142	5% A-D Critical Value					0.719			Kaplan-Meier (KM) Method			
143	K-S Test Statistic					0.719			Mean			0.00307
144	5% K-S Critical Value					0.295			SD			0.0006523
145	**Data appear Gamma Distributed at 5% Significance Level**								SE of Mean			3.475E-05
146									95% KM (t) UCL			0.00313
147	**Assuming Gamma Distribution**								95% KM (z) UCL			0.00313
148	Gamma ROS Statistics using Extrapolated Data								95% KM (jackknife) UCL			0.0032
149	Minimum					0.00145			95% KM (bootstrap t) UCL			0.00315
150	Maximum					0.0579			95% KM (BCA) UCL			0.00615
151	Mean					0.0405			95% KM (Percentile Bootstrap) UCL			0.00411
152	Median					0.0436			95% KM (Chebyshev) UCL			0.00322
153	SD					0.0134			97.5% KM (Chebyshev) UCL			0.00329
154	k star					5.507			99% KM (Chebyshev) UCL			0.00341
155	Theta star					0.00735						
156	Nu star					4670			**Potential UCLs to Use**			
157	AppChi2					4512			95% KM (t) UCL			0.00313
158	95% Gamma Approximate UCL					0.0419			95% KM (Percentile Bootstrap) UCL			0.00411
159	95% Adjusted Gamma UCL					0.0419						

	A	B	C	D	E	F	G	H	I	J	K	L
160	**Note: DL/2 is not a recommended method.**											
161												

1				**General UCL Statistics for Data Sets with Non-Detects**								
2	**User Selected Options**											
3	From File			\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	**Copper, dissolved (downstream)**											
10												
11						**General Statistics**							
12						Number of Valid Data	132			Number of Detected Data		51
13						Number of Distinct Detected Data	37			Number of Non-Detect Data		81
14										Percent Non-Detects		61.36%
15												
16				**Raw Statistics**						**Log-transformed Statistics**		
17						Minimum Detected	0.0019			Minimum Detected		-6.266
18						Maximum Detected	0.119			Maximum Detected		-2.129
19						Mean of Detected	0.00886			Mean of Detected		-5.183
20						SD of Detected	0.0182			SD of Detected		0.685
21						Minimum Non-Detect	0.01			Minimum Non-Detect		-4.605
22						Maximum Non-Detect	0.1			Maximum Non-Detect		-2.303
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		131
25	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
26	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		99.24%
27												
28						**UCL Statistics**							
29				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
30						Lilliefors Test Statistic	0.425			Lilliefors Test Statistic		0.199
31						5% Lilliefors Critical Value	0.124			5% Lilliefors Critical Value		0.124
32				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
33												
34				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
35						DL/2 Substitution Method				DL/2 Substitution Method		
36						Mean	0.00722			Mean		-5.181
37						SD	0.012			SD		0.494
38						95% DL/2 (t) UCL	0.00895			95% H-Stat (DL/2) UCL		0.00811
39												
40						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
41				**MLE method failed to converge properly**						Mean in Log Scale		-5.242
42										SD in Log Scale		0.561
43										Mean in Original Scale		0.00689
44										SD in Original Scale		0.0115
45										95% Percentile Bootstrap UCL		0.00872
46										95% BCA Bootstrap UCL		0.00987
47												
48				**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**		
49						k star (bias corrected)	1.174			**Data do not follow a Discernable Distribution (0.05)**		
50						Theta Star	0.00755					
51						nu star	119.8					
52												
53						A-D Test Statistic	8.257			**Nonparametric Statistics**		

54				5% A-D Critical Value	0.774					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.774					Mean		0.00654
56				5% K-S Critical Value	0.127					SD		0.0114
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.00102
58										95% KM (t) UCL		0.00823
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.00822
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00822
61				Minimum	0.0019					95% KM (bootstrap t) UCL		0.0126
62				Maximum	0.119					95% KM (BCA) UCL		0.00837
63				Mean	0.00853					95% KM (Percentile Bootstrap) UCL		0.00843
64				Median	0.00622					95% KM (Chebyshev) UCL		0.011
65				SD	0.0116					97.5% KM (Chebyshev) UCL		0.0129
66				k star	2.102					99% KM (Chebyshev) UCL		0.0167
67				Theta star	0.00406							
68				Nu star	554.9					**Potential UCLs to Use**		
69				AppChi2	501.3					95% KM (t) UCL		0.00823
70				95% Gamma Approximate UCL	0.00944					95% KM (% Bootstrap) UCL		0.00843
71				95% Adjusted Gamma UCL	0.00945							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Copper, dissolved (upstream)**											
76												
77					**General Statistics**							
78				Number of Valid Data	38					Number of Detected Data		14
79				Number of Distinct Detected Data	14					Number of Non-Detect Data		24
80										Percent Non-Detects		63.16%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.0017					Minimum Detected		-6.377
84				Maximum Detected	0.024					Maximum Detected		-3.73
85				Mean of Detected	0.00601					Mean of Detected		-5.356
86				SD of Detected	0.00563					SD of Detected		0.657
87				Minimum Non-Detect	0.01					Minimum Non-Detect		-4.605
88				Maximum Non-Detect	0.02					Maximum Non-Detect		-3.912
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		37
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		1
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		97.37%
93												
94					**UCL Statistics**							
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Shapiro Wilk Test Statistic	0.643					Shapiro Wilk Test Statistic		0.935
97				5% Shapiro Wilk Critical Value	0.874					5% Shapiro Wilk Critical Value		0.874
98				**Data not Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	0.00568					Mean		-5.274
103				SD	0.00352					SD		0.423
104				95% DL/2 (t) UCL	0.00665					95% H-Stat (DL/2) UCL		0.00734
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	**MLE method failed to converge properly**									Mean in Log Scale		-5.422
108										SD in Log Scale		0.546
109										Mean in Original Scale		0.00521
110										SD in Original Scale		0.00384
111										95% Percentile Bootstrap UCL		0.00633
112										95% BCA Bootstrap UCL		0.00665
113												
114	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
115				k star (bias corrected)		1.787				**Data Follow Appr. Gamma Distribution at 5% Significance Level**		
116				Theta Star		0.00337						
117				nu star		50.02						
118												
119				A-D Test Statistic		0.773				**Nonparametric Statistics**		
120				5% A-D Critical Value		0.745				Kaplan-Meier (KM) Method		
121				K-S Test Statistic		0.745				Mean		0.00514
122				5% K-S Critical Value		0.231				SD		0.00379
123	**Data follow Appr. Gamma Distribution at 5% Significance Level**									SE of Mean		0.0008097
124										95% KM (t) UCL		0.00651
125	**Assuming Gamma Distribution**									95% KM (z) UCL		0.00647
126				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00652
127				Minimum		0.0017				95% KM (bootstrap t) UCL		0.00714
128				Maximum		0.024				95% KM (BCA) UCL		0.00651
129				Mean		0.00595				95% KM (Percentile Bootstrap) UCL		0.00662
130				Median		0.00562				95% KM (Chebyshev) UCL		0.00867
131				SD		0.00337				97.5% KM (Chebyshev) UCL		0.0102
132				k star		5.167				99% KM (Chebyshev) UCL		0.0132
133				Theta star		0.00115						
134				Nu star		392.7				**Potential UCLs to Use**		
135				AppChi2		347.7				95% KM (t) UCL		0.00651
136				95% Gamma Approximate UCL		0.00672						
137				95% Adjusted Gamma UCL		0.00676						
138	**Note: DL/2 is not a recommended method.**											
139												

1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	Fluoride (downstream)											
10												
11					General Statistics							
12						Number of Valid Data	13			Number of Detected Data	9	
13						Number of Distinct Detected Data	6			Number of Non-Detect Data	4	
14										Percent Non-Detects	30.77%	
15												
16					Raw Statistics					Log-transformed Statistics		
17						Minimum Detected	0.26			Minimum Detected	-1.347	
18						Maximum Detected	0.39			Maximum Detected	-0.942	
19						Mean of Detected	0.338			Mean of Detected	-1.092	
20						SD of Detected	0.039			SD of Detected	0.122	
21						Minimum Non-Detect	0.5			Minimum Non-Detect	-0.693	
22						Maximum Non-Detect	0.5			Maximum Non-Detect	-0.693	
23												
24												
25					Warning: There are only 9 Detected Values in this data							
26					Note: It should be noted that even though bootstrap may be performed on this data set							
27					the resulting calculations may not be reliable enough tp draw conclusions							
28												
29					It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.							
30												
31												
32					UCL Statistics							
33					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
34						Shapiro Wilk Test Statistic	0.898			Shapiro Wilk Test Statistic	0.873	
35						5% Shapiro Wilk Critical Value	0.829			5% Shapiro Wilk Critical Value	0.829	
36					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
37												
38					Assuming Normal Distribution					Assuming Lognormal Distribution		
39						DL/2 Substitution Method				DL/2 Substitution Method		
40						Mean	0.311			Mean	-1.182	
41						SD	0.0528			SD	0.173	
42						95% DL/2 (t) UCL	0.337			95% H-Stat (DL/2) UCL	0.386	
43												
44						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
45					MLE method failed to converge properly					Mean in Log Scale	-1.092	
46										SD in Log Scale	0.111	
47										Mean in Original Scale	0.337	
48										SD in Original Scale	0.0358	
49										95% Percentile Bootstrap UCL	0.353	
50										95% BCA Bootstrap UCL	0.351	
51												
52					Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only		
53						k star (bias corrected)	52.82			Data appear Normal at 5% Significance Level		

54					Theta Star	0.00639						
55					nu star	950.8						
56												
57					A-D Test Statistic	0.605	**Nonparametric Statistics**					
58					5% A-D Critical Value	0.72	Kaplan-Meier (KM) Method					
59					K-S Test Statistic	0.72	Mean	0.338				
60					5% K-S Critical Value	0.279	SD	0.0368				
61	**Data follow Appr. Gamma Distribution at 5% Significance Level**						SE of Mean	0.013				
62							95% KM (t) UCL	0.361				
63	**Assuming Gamma Distribution**						95% KM (z) UCL	0.359				
64	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.361				
65	Minimum	0.26					95% KM (bootstrap t) UCL	0.358				
66	Maximum	0.39					95% KM (BCA) UCL	0.357				
67	Mean	0.339					95% KM (Percentile Bootstrap) UCL	0.357				
68	Median	0.34					95% KM (Chebyshev) UCL	0.394				
69	SD	0.0357					97.5% KM (Chebyshev) UCL	0.419				
70	k star	70.81					99% KM (Chebyshev) UCL	0.467				
71	Theta star	0.00478										
72	Nu star	1841					**Potential UCLs to Use**					
73	AppChi2	1742					95% KM (t) UCL	0.361				
74	95% Gamma Approximate UCL	0.358					95% KM (Percentile Bootstrap) UCL	0.357				
75	95% Adjusted Gamma UCL	0.361										
76	**Note: DL/2 is not a recommended method.**											
77												
78												
79	**Fluoride (upstream)**											
80												
81	**General Statistics**											
82	Number of Valid Observations	6					Number of Distinct Observations	4				
83												
84	**Raw Statistics**						**Log-transformed Statistics**					
85	Minimum	0.3					Minimum of Log Data	-1.204				
86	Maximum	0.4					Maximum of Log Data	-0.916				
87	Mean	0.335					Mean of log Data	-1.1				
88	Median	0.32					SD of log Data	0.125				
89	SD	0.0428										
90	Coefficient of Variation	0.128										
91	Skewness	0.724										
92												
93												
94	**Warning: There are only 4 Distinct Values in this data**											
95	**There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.**											
96	**Those methods will return a 'N/A' value on your output display!**											
97												
98	**It is necessary to have 4 or more Distinct Values to compute bootstrap methods.**											
99	**It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.**											
100												
101												
102	**Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!**											
103												
104	**It is suggested to collect at least 8 to 10 observations using these statistical methods!**											
105	**If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
106												

	A	B	C	D	E	F	G	H	I	J	K	L
107	**Relevant UCL Statistics**											
108	**Normal Distribution Test**						**Lognormal Distribution Test**					
109					Shapiro Wilk Test Statistic	0.836					Shapiro Wilk Test Statistic	0.834
110					Shapiro Wilk Critical Value	0.788					Shapiro Wilk Critical Value	0.788
111	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
112												
113	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
114					95% Student's-t UCL	0.37					95% H-UCL	0.374
115	**95% UCLs (Adjusted for Skewness)**										95% Chebyshev (MVUE) UCL	0.409
116					95% Adjusted-CLT UCL	0.369					97.5% Chebyshev (MVUE) UCL	0.441
117					95% Modified-t UCL	0.371					99% Chebyshev (MVUE) UCL	0.505
118												
119	**Gamma Distribution Test**						**Data Distribution**					
120					k star (bias corrected)	38.15	**Data appear Normal at 5% Significance Level**					
121					Theta Star	0.00878						
122					nu star	457.8						
123					Approximate Chi Square Value (.05)	409.2	**Nonparametric Statistics**					
124					Adjusted Level of Significance	0.0122					95% CLT UCL	0.364
125					Adjusted Chi Square Value	392.4					95% Jackknife UCL	0.37
126											95% Standard Bootstrap UCL	0.36
127					Anderson-Darling Test Statistic	0.566					95% Bootstrap-t UCL	0.38
128					Anderson-Darling 5% Critical Value	0.697					95% Hall's Bootstrap UCL	0.355
129					Kolmogorov-Smirnov Test Statistic	0.318					95% Percentile Bootstrap UCL	0.363
130					Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	0.36
131	**Data appear Gamma Distributed at 5% Significance Level**										95% Chebyshev(Mean, Sd) UCL	0.411
132											97.5% Chebyshev(Mean, Sd) UCL	0.444
133	**Assuming Gamma Distribution**										99% Chebyshev(Mean, Sd) UCL	0.509
134					95% Approximate Gamma UCL	0.375						
135					95% Adjusted Gamma UCL	0.391						
136												
137	**Potential UCL to Use**										Use 95% Student's-t UCL	0.37
138												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Hexavalent chromium (downstream)

General Statistics

Number of Valid Data	547	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	546
		Percent Non-Detects	99.82%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Hexavalent chromium (downstream) was not processed!

Hexavalent chromium (other)

General Statistics

Number of Valid Data	26	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	26
		Percent Non-Detects	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Hexavalent chromium (other) was not processed!

Hexavalent chromium (upstream)

General Statistics

Number of Valid Data	420	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	420
		Percent Non-Detects	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Hexavalent chromium (upstream) was not processed!

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Iron, dissolved (downstream)

General Statistics

Number of Valid Data	8	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	8
		Percent Non-Detects	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Iron, dissolved (downstream) was not processed!

Iron, dissolved (upstream)

General Statistics

Number of Valid Data	2	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	2
		Percent Non-Detects	100.00%

Warning: This data set only has 2 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Iron, dissolved (upstream) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	Lead, dissolved (downstream)											
10												
11					General Statistics							
12						Number of Valid Data	5			Number of Detected Data	2	
13						Number of Distinct Detected Data	2			Number of Non-Detect Data	3	
14										Percent Non-Detects	60.00%	
15												
16					Raw Statistics					Log-transformed Statistics		
17						Minimum Detected	0.002			Minimum Detected	-6.215	
18						Maximum Detected	0.0026			Maximum Detected	-5.952	
19						Mean of Detected	0.0023			Mean of Detected	-6.083	
20						SD of Detected	0.0004243			SD of Detected	0.186	
21						Minimum Non-Detect	0.002			Minimum Non-Detect	-6.215	
22						Maximum Non-Detect	0.005			Maximum Non-Detect	-5.298	
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	5	
25	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
26	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
27												
28	Warning: Data set has only 2 Distinct Detected Values.											
29	This may not be adequate enough to compute meaningful and reliable test statistics and estimates.											
30	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
31												
32	Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.											
33												
34	The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.											
35	Those methods will return a 'N/A' value on your output display!											
36												
37	It is necessary to have 4 or more Distinct Values for bootstrap methods.											
38	It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.											
39												
40												
41					UCL Statistics							
42					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
43						Shapiro Wilk Test Statistic	1			Shapiro Wilk Test Statistic	1	
44						5% Shapiro Wilk Critical Value	N/A			5% Shapiro Wilk Critical Value	N/A	
45					Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level		
46												
47					Assuming Normal Distribution					Assuming Lognormal Distribution		
48						DL/2 Substitution Method				DL/2 Substitution Method		
49						Mean	0.00212			Mean	-6.212	
50						SD	0.0006686			SD	0.403	
51						95% DL/2 (t) UCL	0.00276			95% H-Stat (DL/2) UCL	0.0169	
52												
53						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		

54	MLE method failed to converge properly						Mean in Log Scale					N/A
55							SD in Log Scale					N/A
56							Mean in Original Scale					N/A
57							SD in Original Scale					N/A
58							95% Percentile Bootstrap UCL					N/A
59							95% BCA Bootstrap UCL					N/A
60												
61	Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only					
62				k star (bias corrected)		N/A	Data do not follow a Discernable Distribution (0.05)					
63				Theta Star		N/A						
64				nu star		N/A						
65												
66				A-D Test Statistic		0.359	Nonparametric Statistics					
67				5% A-D Critical Value		N/A	Kaplan-Meier (KM) Method					
68				K-S Test Statistic		N/A	Mean					0.0022
69				5% K-S Critical Value		N/A	SD					0.0002828
70	Data not Gamma Distributed at 5% Significance Level						SE of Mean					0.0002309
71							95% KM (t) UCL					0.00269
72	Assuming Gamma Distribution						95% KM (z) UCL					0.00258
73				Gamma ROS Statistics using Extrapolated Data			95% KM (jackknife) UCL					N/A
74				Minimum		N/A	95% KM (bootstrap t) UCL					N/A
75				Maximum		N/A	95% KM (BCA) UCL					N/A
76				Mean		N/A	95% KM (Percentile Bootstrap) UCL					N/A
77				Median		N/A	95% KM (Chebyshev) UCL					0.00321
78				SD		N/A	97.5% KM (Chebyshev) UCL					0.00364
79				k star		N/A	99% KM (Chebyshev) UCL					0.0045
80				Theta star		N/A						
81				Nu star		N/A	Potential UCLs to Use					
82				AppChi2		N/A	95% KM (t) UCL					0.00269
83				95% Gamma Approximate UCL		N/A	95% KM (% Bootstrap) UCL					N/A
84				95% Adjusted Gamma UCL		N/A						
85	Warning: Recommended UCL exceeds the maximum observation											
86	Note: DL/2 is not a recommended method.											
87												
88												
89	Lead, dissolved (upstream)											
90												
91	General Statistics											
92				Number of Valid Data		4	Number of Detected Data					1
93				Number of Distinct Detected Data		1	Number of Non-Detect Data					3
94							Percent Non-Detects					75.00%
95												
96	Warning: This data set only has 4 observations!											
97	Data set is too small to compute reliable and meaningful statistics and estimates!											
98	The data set for variable Lead, dissolved (upstream) was not processed!											
99												
100	It is suggested to collect at least 8 to 10 observations before using these statistical methods!											
101	If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.											
102												
103												

1				**General UCL Statistics for Data Sets with Non-Detects**								
2	**User Selected Options**											
3	From File			\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	**Magnesium, dissolved (downstream)**											
10												
11	**General Statistics**											
12	Number of Valid Observations			39		Number of Distinct Observations					29	
13												
14	**Raw Statistics**					**Log-transformed Statistics**						
15	Minimum			25.2		Minimum of Log Data					3.227	
16	Maximum			36.2		Maximum of Log Data					3.589	
17	Mean			29.41		Mean of log Data					3.378	
18	Median			29.8		SD of log Data					0.0763	
19	SD			2.253								
20	Coefficient of Variation			0.0766								
21	Skewness			0.333								
22												
23	**Relevant UCL Statistics**											
24	**Normal Distribution Test**					**Lognormal Distribution Test**						
25	Shapiro Wilk Test Statistic			0.955		Shapiro Wilk Test Statistic					0.96	
26	Shapiro Wilk Critical Value			0.939		Shapiro Wilk Critical Value					0.939	
27	**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**						
28												
29	**Assuming Normal Distribution**					**Assuming Lognormal Distribution**						
30	95% Student's-t UCL			30.01		95% H-UCL					N/A	
31	**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL					30.97	
32	95% Adjusted-CLT UCL			30.02		97.5% Chebyshev (MVUE) UCL					31.65	
33	95% Modified-t UCL			30.02		99% Chebyshev (MVUE) UCL					32.98	
34												
35	**Gamma Distribution Test**					**Data Distribution**						
36	k star (bias corrected)			162.7		**Data appear Normal at 5% Significance Level**						
37	Theta Star			0.181								
38	nu star			12691								
39	Approximate Chi Square Value (.05)			12430		**Nonparametric Statistics**						
40	Adjusted Level of Significance			0.0437		95% CLT UCL					30	
41	Adjusted Chi Square Value			12420		95% Jackknife UCL					30.01	
42						95% Standard Bootstrap UCL					30	
43	Anderson-Darling Test Statistic			0.538		95% Bootstrap-t UCL					30.04	
44	Anderson-Darling 5% Critical Value			0.747		95% Hall's Bootstrap UCL					30.02	
45	Kolmogorov-Smirnov Test Statistic			0.0943		95% Percentile Bootstrap UCL					30.01	
46	Kolmogorov-Smirnov 5% Critical Value			0.141		95% BCA Bootstrap UCL					29.98	
47	**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL					30.98	
48						97.5% Chebyshev(Mean, Sd) UCL					31.66	
49	**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL					32.99	
50	95% Approximate Gamma UCL			30.02								
51	95% Adjusted Gamma UCL			30.05								
52												
53	**Potential UCL to Use**					Use 95% Student's-t UCL					30.01	

Magnesium, dissolved (upstream)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	5

Raw Statistics		**Log-transformed Statistics**	
Minimum	26.1	Minimum of Log Data	3.262
Maximum	27.9	Maximum of Log Data	3.329
Mean	26.8	Mean of log Data	3.288
Median	26.6	SD of log Data	0.0292
SD	0.785		
Coefficient of Variation	0.0293		
Skewness	0.484		

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.853	Shapiro Wilk Test Statistic	0.852
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	27.45	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	28.19
95% Adjusted-CLT UCL	27.39	97.5% Chebyshev (MVUE) UCL	28.79
95% Modified-t UCL	27.46	99% Chebyshev (MVUE) UCL	29.97
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	703.8	**Data appear Normal at 5% Significance Level**	
Theta Star	0.0381		
nu star	8446		
Approximate Chi Square Value (.05)	8234	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	27.33
Adjusted Chi Square Value	8156	95% Jackknife UCL	27.45
		95% Standard Bootstrap UCL	27.28
Anderson-Darling Test Statistic	0.517	95% Bootstrap-t UCL	27.92
Anderson-Darling 5% Critical Value	0.696	95% Hall's Bootstrap UCL	27.23
Kolmogorov-Smirnov Test Statistic	0.299	95% Percentile Bootstrap UCL	27.27
Kolmogorov-Smirnov 5% Critical Value	0.332	95% BCA Bootstrap UCL	27.32

	A	B	C	D	E	F	G	H	I	J	K	L
107	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					28.2
108							97.5% Chebyshev(Mean, Sd) UCL					28.8
109	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					29.99
110	95% Approximate Gamma UCL					27.49						
111	95% Adjusted Gamma UCL					27.75						
112												
113	**Potential UCL to Use**						Use 95% Student's-t UCL					27.45
114												

1				General UCL Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3			From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	Manganese, dissolved (downstream)											
10												
11					General Statistics							
12						Number of Valid Data	13			Number of Detected Data	5	
13						Number of Distinct Detected Data	5			Number of Non-Detect Data	8	
14										Percent Non-Detects	61.54%	
15												
16					Raw Statistics					Log-transformed Statistics		
17						Minimum Detected	0.0036			Minimum Detected	-5.627	
18						Maximum Detected	0.008			Maximum Detected	-4.828	
19						Mean of Detected	0.0057			Mean of Detected	-5.207	
20						SD of Detected	0.00177			SD of Detected	0.316	
21						Minimum Non-Detect	0.01			Minimum Non-Detect	-4.605	
22						Maximum Non-Detect	0.5			Maximum Non-Detect	-0.693	
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	13	
25	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	0	
26	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	100.00%	
27												
28					Warning: There are only 5 Detected Values in this data							
29					Note: It should be noted that even though bootstrap may be performed on this data set							
30					the resulting calculations may not be reliable enough tp draw conclusions							
31												
32					It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.							
33												
34												
35					UCL Statistics							
36					Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only		
37						Shapiro Wilk Test Statistic	0.94			Shapiro Wilk Test Statistic	0.95	
38						5% Shapiro Wilk Critical Value	0.762			5% Shapiro Wilk Critical Value	0.762	
39					Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level		
40												
41					Assuming Normal Distribution					Assuming Lognormal Distribution		
42						DL/2 Substitution Method				DL/2 Substitution Method		
43						Mean	0.137			Mean	-3.157	
44						SD	0.127			SD	1.999	
45						95% DL/2 (t) UCL	0.2			95% H-Stat (DL/2) UCL	15.47	
46												
47						Maximum Likelihood Estimate(MLE) Method	N/A			Log ROS Method		
48					MLE method failed to converge properly					Mean in Log Scale	-5.207	
49										SD in Log Scale	0.295	
50										Mean in Original Scale	0.0057	
51										SD in Original Scale	0.00167	
52										95% Percentile Bootstrap UCL	0.00645	
53										95% BCA Bootstrap UCL	0.0065	

54												
55	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
56				k star (bias corrected)		5.266	**Data appear Normal at 5% Significance Level**					
57				Theta Star		0.00108						
58				nu star		52.66						
59												
60				A-D Test Statistic		0.291	**Nonparametric Statistics**					
61				5% A-D Critical Value		0.679				Kaplan-Meier (KM) Method		
62				K-S Test Statistic		0.679				Mean		0.0057
63				5% K-S Critical Value		0.357				SD		0.00158
64	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.0007912
65										95% KM (t) UCL		0.00711
66	**Assuming Gamma Distribution**									95% KM (z) UCL		0.007
67				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00721
68				Minimum		0.00276				95% KM (bootstrap t) UCL		0.00859
69				Maximum		0.008				95% KM (BCA) UCL		0.007
70				Mean		0.0057				95% KM (Percentile Bootstrap) UCL		0.007
71				Median		0.00594				95% KM (Chebyshev) UCL		0.00915
72				SD		0.00162				97.5% KM (Chebyshev) UCL		0.0106
73				k star		9.214				99% KM (Chebyshev) UCL		0.0136
74				Theta star		0.0006182						
75				Nu star		239.6	**Potential UCLs to Use**					
76				AppChi2		204.7				95% KM (t) UCL		0.00711
77				95% Gamma Approximate UCL		0.00666				95% KM (Percentile Bootstrap) UCL		0.007
78				95% Adjusted Gamma UCL		0.00682						
79	**Note: DL/2 is not a recommended method.**											
80												
81												
82	**Manganese, dissolved (upstream)**											
83												
84	**General Statistics**											
85				Number of Valid Data		6				Number of Detected Data		2
86				Number of Distinct Detected Data		2				Number of Non-Detect Data		4
87										Percent Non-Detects		66.67%
88												
89	**Raw Statistics**						**Log-transformed Statistics**					
90				Minimum Detected		0.002				Minimum Detected		-6.215
91				Maximum Detected		0.0055				Maximum Detected		-5.203
92				Mean of Detected		0.00375				Mean of Detected		-5.709
93				SD of Detected		0.00247				SD of Detected		0.715
94				Minimum Non-Detect		0.005				Minimum Non-Detect		-5.298
95				Maximum Non-Detect		0.5				Maximum Non-Detect		-0.693
96												
97	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		6
98	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
99	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
100												
101	**Warning: Data set has only 2 Distinct Detected Values.**											
102	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
103	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
104												
105	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
106												

	A	B	C	D	E	F	G	H	I	J	K	L
107	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
108	**Those methods will return a 'N/A' value on your output display!**											
109												
110	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
111	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
112												
113												
114	**UCL Statistics**											
115	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
116					Shapiro Wilk Test Statistic	1					Shapiro Wilk Test Statistic	1
117					5% Shapiro Wilk Critical Value	N/A					5% Shapiro Wilk Critical Value	N/A
118	**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**					
119												
120	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
121					DL/2 Substitution Method						DL/2 Substitution Method	
122					Mean	0.0446					Mean	-5.014
123					SD	0.101					SD	1.824
124					95% DL/2 (t) UCL	0.127					95% H-Stat (DL/2) UCL	19.24
125												
126					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
127	**MLE method failed to converge properly**										Mean in Log Scale	N/A
128											SD in Log Scale	N/A
129											Mean in Original Scale	N/A
130											SD in Original Scale	N/A
131											95% Percentile Bootstrap UCL	N/A
132											95% BCA Bootstrap UCL	N/A
133												
134	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
135					k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**					
136					Theta Star	N/A						
137					nu star	N/A						
138												
139					A-D Test Statistic	0.359	**Nonparametric Statistics**					
140					5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method					
141					K-S Test Statistic	N/A					Mean	0.00288
142					5% K-S Critical Value	N/A					SD	0.00152
143	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.00107
144											95% KM (t) UCL	0.00503
145	**Assuming Gamma Distribution**										95% KM (z) UCL	0.00464
146					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.00577
147					Minimum	N/A					95% KM (bootstrap t) UCL	1.8E+308
148					Maximum	N/A					95% KM (BCA) UCL	N/A
149					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.0055
150					Median	N/A					95% KM (Chebyshev) UCL	0.00755
151					SD	N/A					97.5% KM (Chebyshev) UCL	0.00957
152					k star	N/A					99% KM (Chebyshev) UCL	0.0135
153					Theta star	N/A						
154					Nu star	N/A	**Potential UCLs to Use**					
155					AppChi2	N/A					95% KM (t) UCL	0.00503
156					95% Gamma Approximate UCL	N/A					95% KM (% Bootstrap) UCL	0.0055
157					95% Adjusted Gamma UCL	N/A						
158	**Note: DL/2 is not a recommended method.**											
159												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Molybdenum, dissolved (downstream)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	4

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0042	Minimum of Log Data	-5.473
Maximum	0.007	Maximum of Log Data	-4.962
Mean	0.00527	Mean of log Data	-5.258
Median	0.005	SD of log Data	0.167
SD	0.0009352		
Coefficient of Variation	0.178		
Skewness	1.445		

Warning: There are only 4 Distinct Values in this data

There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.

It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.837	Shapiro Wilk Test Statistic	0.875
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.00604	95% H-UCL	0.00614
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.00683
95% Adjusted-CLT UCL	0.00614	97.5% Chebyshev (MVUE) UCL	0.00751
95% Modified-t UCL	0.00607	99% Chebyshev (MVUE) UCL	0.00884
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	20.83	**Data appear Normal at 5% Significance Level**	
Theta Star	0.0002528		
nu star	250		
Approximate Chi Square Value (.05)	214.4	**Nonparametric Statistics**	

54				Adjusted Level of Significance	0.0122					95% CLT UCL	0.00589	
55				Adjusted Chi Square Value	202.4					95% Jackknife UCL	0.00604	
56										95% Standard Bootstrap UCL	0.00585	
57				Anderson-Darling Test Statistic	0.568					95% Bootstrap-t UCL	0.00641	
58				Anderson-Darling 5% Critical Value	0.697					95% Hall's Bootstrap UCL	0.00959	
59				Kolmogorov-Smirnov Test Statistic	0.277					95% Percentile Bootstrap UCL	0.00587	
60				Kolmogorov-Smirnov 5% Critical Value	0.332					95% BCA Bootstrap UCL	0.00593	
61				**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL	0.00693	
62										97.5% Chebyshev(Mean, Sd) UCL	0.00765	
63				**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL	0.00907	
64				95% Approximate Gamma UCL	0.00614							
65				95% Adjusted Gamma UCL	0.0065							
66												
67				**Potential UCL to Use**						Use 95% Student's-t UCL	0.00604	
68												
69												
70	**Molybdenum, dissolved (upstream)**											
71												
72					**General Statistics**							
73				Number of Valid Data	4					Number of Detected Data	2	
74				Number of Distinct Detected Data	2					Number of Non-Detect Data	2	
75										Percent Non-Detects	50.00%	
76												
77				**Warning: This data set only has 4 observations!**								
78				**Data set is too small to compute reliable and meaningful statistics and estimates!**								
79				**The data set for variable Molybdenum, dissolved (upstream) was not processed!**								
80												
81				**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**								
82				**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**								
83												
84												

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Nickel, dissolved (downstream)											
10												
11	General Statistics											
12	Number of Valid Data			132		Number of Detected Data			52			
13	Number of Distinct Detected Data			37		Number of Non-Detect Data			80			
14						Percent Non-Detects			60.61%			
15												
16	Raw Statistics					Log-transformed Statistics						
17	Minimum Detected			0.00094		Minimum Detected			-6.97			
18	Maximum Detected			0.03		Maximum Detected			-3.507			
19	Mean of Detected			0.00488		Mean of Detected			-5.783			
20	SD of Detected			0.00611		SD of Detected			0.882			
21	Minimum Non-Detect			0.005		Minimum Non-Detect			-5.298			
22	Maximum Non-Detect			0.25		Maximum Non-Detect			-1.386			
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect			132			
25	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected			0			
26	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage			100.00%			
27												
28	UCL Statistics											
29	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
30	Lilliefors Test Statistic			0.259		Lilliefors Test Statistic			0.155			
31	5% Lilliefors Critical Value			0.123		5% Lilliefors Critical Value			0.123			
32	Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level						
33												
34	Assuming Normal Distribution					Assuming Lognormal Distribution						
35	DL/2 Substitution Method					DL/2 Substitution Method						
36	Mean			0.00953		Mean			-5.04			
37	SD			0.0115		SD			0.933			
38	95% DL/2 (t) UCL			0.0112		95% H-Stat (DL/2) UCL			0.0189			
39												
40	Maximum Likelihood Estimate(MLE) Method			N/A		Log ROS Method						
41	MLE method failed to converge properly					Mean in Log Scale			-5.879			
42						SD in Log Scale			0.77			
43						Mean in Original Scale			0.00392			
44						SD in Original Scale			0.0043			
45						95% Percentile Bootstrap UCL			0.00455			
46						95% BCA Bootstrap UCL			0.0046			
47												
48	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
49	k star (bias corrected)			1.166		Data do not follow a Discernable Distribution (0.05)						
50	Theta Star			0.00419								
51	nu star			121.3								
52												
53	A-D Test Statistic			2.911		Nonparametric Statistics						

54				5% A-D Critical Value	0.774					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.774					Mean		0.00411
56				5% K-S Critical Value	0.126					SD		0.00495
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.0005805
58										95% KM (t) UCL		0.00507
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.00507
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.00507
61				Minimum	1E-09					95% KM (bootstrap t) UCL		0.00533
62				Maximum	0.03					95% KM (BCA) UCL		0.0052
63				Mean	0.00537					95% KM (Percentile Bootstrap) UCL		0.00511
64				Median	0.00426					95% KM (Chebyshev) UCL		0.00664
65				SD	0.00489					97.5% KM (Chebyshev) UCL		0.00774
66				k star	0.479					99% KM (Chebyshev) UCL		0.00989
67				Theta star	0.0112							
68				Nu star	126.5					**Potential UCLs to Use**		
69				AppChi2	101.5					95% KM (t) UCL		0.00507
70				95% Gamma Approximate UCL	0.00669					95% KM (% Bootstrap) UCL		0.00511
71				95% Adjusted Gamma UCL	0.00671							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Nickel, dissolved (upstream)**											
76												
77										**General Statistics**		
78				Number of Valid Data	38					Number of Detected Data		10
79				Number of Distinct Detected Data	10					Number of Non-Detect Data		28
80										Percent Non-Detects		73.68%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.001					Minimum Detected		-6.908
84				Maximum Detected	0.0069					Maximum Detected		-4.976
85				Mean of Detected	0.00276					Mean of Detected		-6.062
86				SD of Detected	0.00182					SD of Detected		0.603
87				Minimum Non-Detect	0.005					Minimum Non-Detect		-5.298
88				Maximum Non-Detect	0.0278					Maximum Non-Detect		-3.583
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		38
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		0
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		100.00%
93												
94										**UCL Statistics**		
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Shapiro Wilk Test Statistic	0.853					Shapiro Wilk Test Statistic		0.975
97				5% Shapiro Wilk Critical Value	0.842					5% Shapiro Wilk Critical Value		0.842
98				**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	0.00846					Mean		-5.02
103				SD	0.00458					SD		0.824
104				95% DL/2 (t) UCL	0.00971					95% H-Stat (DL/2) UCL		0.0193
105												
106				Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method		

107	**MLE method failed to converge properly**									Mean in Log Scale		-6.098
108										SD in Log Scale		0.499
109										Mean in Original Scale		0.00254
110										SD in Original Scale		0.00135
111										95% Percentile Bootstrap UCL		0.00291
112										95% BCA Bootstrap UCL		0.00294
113												
114	**Gamma Distribution Test with Detected Values Only**									**Data Distribution Test with Detected Values Only**		
115					k star (bias corrected)	2.236				**Data appear Normal at 5% Significance Level**		
116					Theta Star	0.00123						
117					nu star	44.73						
118												
119					A-D Test Statistic	0.254				**Nonparametric Statistics**		
120					5% A-D Critical Value	0.732				Kaplan-Meier (KM) Method		
121					K-S Test Statistic	0.732				Mean		0.00265
122					5% K-S Critical Value	0.268				SD		0.00161
123	**Data appear Gamma Distributed at 5% Significance Level**									SE of Mean		0.0005032
124										95% KM (t) UCL		0.0035
125	**Assuming Gamma Distribution**									95% KM (z) UCL		0.00348
126					Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL		0.00353
127					Minimum	0.001				95% KM (bootstrap t) UCL		0.00422
128					Maximum	0.0069				95% KM (BCA) UCL		0.00356
129					Mean	0.00285				95% KM (Percentile Bootstrap) UCL		0.00351
130					Median	0.00289				95% KM (Chebyshev) UCL		0.00485
131					SD	0.001				97.5% KM (Chebyshev) UCL		0.0058
132					k star	8.134				99% KM (Chebyshev) UCL		0.00766
133					Theta star	0.0003508						
134					Nu star	618.2				**Potential UCLs to Use**		
135					AppChi2	561.5				95% KM (t) UCL		0.0035
136					95% Gamma Approximate UCL	0.00314				95% KM (Percentile Bootstrap) UCL		0.00351
137					95% Adjusted Gamma UCL	0.00315						
138	**Note: DL/2 is not a recommended method.**											
139												

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_nitrate_dat								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Nitrate as Nitrogen (downstream)											
10												
11	General Statistics											
12	Number of Valid Data			49		Number of Detected Data						27
13	Number of Distinct Detected Data			21		Number of Non-Detect Data						22
14						Percent Non-Detects						44.90%
15												
16	Raw Statistics					Log-transformed Statistics						
17	Minimum Detected			0.176		Minimum Detected						-1.737
18	Maximum Detected			0.89		Maximum Detected						-0.117
19	Mean of Detected			0.471		Mean of Detected						-0.796
20	SD of Detected			0.134		SD of Detected						0.308
21	Minimum Non-Detect			0.4		Minimum Non-Detect						-0.916
22	Maximum Non-Detect			12.5		Maximum Non-Detect						2.526
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect						49
25	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected						0
26	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage						100.00%
27												
28	UCL Statistics											
29	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
30	Shapiro Wilk Test Statistic			0.832		Shapiro Wilk Test Statistic						0.837
31	5% Shapiro Wilk Critical Value			0.923		5% Shapiro Wilk Critical Value						0.923
32	Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level						
33												
34	Assuming Normal Distribution					Assuming Lognormal Distribution						
35	DL/2 Substitution Method					DL/2 Substitution Method						
36	Mean			0.49		Mean						-1.013
37	SD			0.854		SD						0.571
38	95% DL/2 (t) UCL			0.695		95% H-Stat (DL/2) UCL						0.52
39												
40	Maximum Likelihood Estimate(MLE) Method			N/A		Log ROS Method						
41	MLE method failed to converge properly					Mean in Log Scale						-0.93
42						SD in Log Scale						0.296
43						Mean in Original Scale						0.412
44						SD in Original Scale						0.124
45						95% Percentile Bootstrap UCL						0.441
46						95% BCA Bootstrap UCL						0.445
47												
48	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
49	k star (bias corrected)			10.73		Data do not follow a Discernable Distribution (0.05)						
50	Theta Star			0.0439								
51	nu star			579.5								
52												
53	A-D Test Statistic			2.03		Nonparametric Statistics						

54				5% A-D Critical Value	0.744				Kaplan-Meier (KM) Method			
55				K-S Test Statistic	0.744				Mean			0.41
56				5% K-S Critical Value	0.168				SD			0.126
57				**Data not Gamma Distributed at 5% Significance Level**					SE of Mean			0.0211
58									95% KM (t) UCL			0.445
59				**Assuming Gamma Distribution**					95% KM (z) UCL			0.444
60				Gamma ROS Statistics using Extrapolated Data					95% KM (jackknife) UCL			0.446
61				Minimum	0.176				95% KM (bootstrap t) UCL			0.445
62				Maximum	0.89				95% KM (BCA) UCL			0.442
63				Mean	0.473				95% KM (Percentile Bootstrap) UCL			0.444
64				Median	0.49				95% KM (Chebyshev) UCL			0.502
65				SD	0.0997				97.5% KM (Chebyshev) UCL			0.541
66				k star	19.95				99% KM (Chebyshev) UCL			0.619
67				Theta star	0.0237							
68				Nu star	1955				**Potential UCLs to Use**			
69				AppChi2	1854				95% KM (t) UCL			0.445
70				95% Gamma Approximate UCL	0.499				95% KM (% Bootstrap) UCL			0.444
71				95% Adjusted Gamma UCL	0.5							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Nitrate as Nitrogen (other)**											
76												
77					**General Statistics**							
78				Number of Valid Data	2				Number of Detected Data			0
79				Number of Distinct Detected Data	0				Number of Non-Detect Data			2
80									Percent Non-Detects			100.00%
81												
82					**Warning: This data set only has 2 observations!**							
83					**Data set is too small to compute reliable and meaningful statistics and estimates!**							
84					**The data set for variable Nitrate as Nitrogen (other) was not processed!**							
85												
86					**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**							
87					**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**							
88												
89												
90												
91	**Nitrate as Nitrogen (upstream)**											
92												
93					**General Statistics**							
94				Number of Valid Data	6				Number of Detected Data			5
95				Number of Distinct Detected Data	5				Number of Non-Detect Data			1
96									Percent Non-Detects			16.67%
97												
98				**Raw Statistics**					**Log-transformed Statistics**			
99				Minimum Detected	0.0452				Minimum Detected			-3.098
100				Maximum Detected	0.452				Maximum Detected			-0.795
101				Mean of Detected	0.273				Mean of Detected			-1.536
102				SD of Detected	0.154				SD of Detected			0.913
103				Minimum Non-Detect	0.4				Minimum Non-Detect			-0.916
104				Maximum Non-Detect	0.4				Maximum Non-Detect			-0.916
105												
106												

	A	B	C	D	E	F	G	H	I	J	K	L
107	**Warning: There are only 5 Detected Values in this data**											
108	**Note: It should be noted that even though bootstrap may be performed on this data set**											
109	**the resulting calculations may not be reliable enough tp draw conclusions**											
110												
111	**It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.**											
112												
113												
114	**UCL Statistics**											
115	**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**					
116					Shapiro Wilk Test Statistic	0.974					Shapiro Wilk Test Statistic	0.815
117					5% Shapiro Wilk Critical Value	0.762					5% Shapiro Wilk Critical Value	0.762
118	**Data appear Normal at 5% Significance Level**						**Data appear Lognormal at 5% Significance Level**					
119												
120	**Assuming Normal Distribution**						**Assuming Lognormal Distribution**					
121					DL/2 Substitution Method						DL/2 Substitution Method	
122					Mean	0.261					Mean	-1.548
123					SD	0.141					SD	0.817
124					95% DL/2 (t) UCL	0.377					95% H-Stat (DL/2) UCL	1.004
125												
126					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
127	**MLE method failed to converge properly**										Mean in Log Scale	-1.578
128											SD in Log Scale	0.823
129											Mean in Original Scale	0.255
130											SD in Original Scale	0.145
131											95% Percentile Bootstrap UCL	0.34
132											95% BCA Bootstrap UCL	0.34
133												
134	**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**					
135					k star (bias corrected)	1.039	**Data appear Normal at 5% Significance Level**					
136					Theta Star	0.262						
137					nu star	10.39						
138												
139					A-D Test Statistic	0.427	**Nonparametric Statistics**					
140					5% A-D Critical Value	0.684					Kaplan-Meier (KM) Method	
141					K-S Test Statistic	0.684					Mean	0.265
142					5% K-S Critical Value	0.36					SD	0.136
143	**Data appear Gamma Distributed at 5% Significance Level**										SE of Mean	0.0667
144											95% KM (t) UCL	0.4
145	**Assuming Gamma Distribution**										95% KM (z) UCL	0.375
146					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.403
147					Minimum	0.0452					95% KM (bootstrap t) UCL	0.385
148					Maximum	0.452					95% KM (BCA) UCL	0.363
149					Mean	0.273					95% KM (Percentile Bootstrap) UCL	0.363
150					Median	0.271					95% KM (Chebyshev) UCL	0.556
151					SD	0.138					97.5% KM (Chebyshev) UCL	0.682
152					k star	1.456					99% KM (Chebyshev) UCL	0.929
153					Theta star	0.187						
154					Nu star	17.47	**Potential UCLs to Use**					
155					AppChi2	9.008					95% KM (t) UCL	0.4
156					95% Gamma Approximate UCL	0.529					95% KM (Percentile Bootstrap) UCL	0.363
157					95% Adjusted Gamma UCL	0.687						
158	**Note: DL/2 is not a recommended method.**											
159												

	General UCL Statistics for Data Sets with Non-Detects	
	User Selected Options	
	From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_
	Full Precision	OFF
	Confidence Coefficient	95%
	Number of Bootstrap Operations	2000

Nitrate (downstream)

General Statistics

Number of Valid Observations	3	Number of Distinct Observations	3

Warning: This data set only has 3 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Nitrate (downstream) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Nitrate (upstream)

General Statistics

Number of Valid Observations	4	Number of Distinct Observations	4

Warning: This data set only has 4 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Nitrate (upstream) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Perchlorate (downstream)

General Statistics

Number of Valid Data	1	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	1
		Percent Non-Detects	100.00%

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Perchlorate (downstream) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Perchlorate (upstream)

General Statistics

Number of Valid Data	1	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	1
		Percent Non-Detects	100.00%

Warning: This data set only has 1 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable Perchlorate (upstream) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Potassium, dissolved (downstream)

General Statistics

Number of Valid Observations	39	Number of Distinct Observations	35

Raw Statistics		**Log-transformed Statistics**	
Minimum	3.12	Minimum of Log Data	1.138
Maximum	6.56	Maximum of Log Data	1.881
Mean	5.117	Mean of log Data	1.62
Median	4.95	SD of log Data	0.166
SD	0.817		
Coefficient of Variation	0.16		
Skewness	-0.173		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.968	Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	5.338	95% H-UCL	5.364
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.717
95% Adjusted-CLT UCL	5.328	97.5% Chebyshev (MVUE) UCL	5.976
95% Modified-t UCL	5.337	99% Chebyshev (MVUE) UCL	6.484
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	35.48	**Data appear Normal at 5% Significance Level**	
Theta Star	0.144		
nu star	2767		
Approximate Chi Square Value (.05)	2646	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0437	95% CLT UCL	5.332
Adjusted Chi Square Value	2641	95% Jackknife UCL	5.338
		95% Standard Bootstrap UCL	5.333
Anderson-Darling Test Statistic	0.41	95% Bootstrap-t UCL	5.33
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	5.324
Kolmogorov-Smirnov Test Statistic	0.0895	95% Percentile Bootstrap UCL	5.33
Kolmogorov-Smirnov 5% Critical Value	0.141	95% BCA Bootstrap UCL	5.335
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.687
		97.5% Chebyshev(Mean, Sd) UCL	5.934
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.418
95% Approximate Gamma UCL	5.352		
95% Adjusted Gamma UCL	5.361		
Potential UCL to Use		Use 95% Student's-t UCL	5.338

Potassium, dissolved (upstream)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	4.2	Minimum of Log Data	1.435
Maximum	5.54	Maximum of Log Data	1.712
Mean	4.608	Mean of log Data	1.523
Median	4.5	SD of log Data	0.106
SD	0.511		
Coefficient of Variation	0.111		
Skewness	1.461		

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.819	Shapiro Wilk Test Statistic	0.837
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	5.029	95% H-UCL	5.058
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.476
95% Adjusted-CLT UCL	5.084	97.5% Chebyshev (MVUE) UCL	5.852
95% Modified-t UCL	5.049	99% Chebyshev (MVUE) UCL	6.59
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	52.07	**Data appear Normal at 5% Significance Level**	
Theta Star	0.0885		
nu star	624.8		
Approximate Chi Square Value (.05)	567.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	4.951
Adjusted Chi Square Value	548	95% Jackknife UCL	5.029
		95% Standard Bootstrap UCL	4.923
Anderson-Darling Test Statistic	0.543	95% Bootstrap-t UCL	5.377
Anderson-Darling 5% Critical Value	0.696	95% Hall's Bootstrap UCL	5.962
Kolmogorov-Smirnov Test Statistic	0.247	95% Percentile Bootstrap UCL	4.957
Kolmogorov-Smirnov 5% Critical Value	0.332	95% BCA Bootstrap UCL	5.037

	A	B	C	D	E	F	G	H	I	J	K	L
107	**Data appear Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					5.518
108							97.5% Chebyshev(Mean, Sd) UCL					5.911
109	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					6.684
110	95% Approximate Gamma UCL					5.071						
111	95% Adjusted Gamma UCL					5.254						
112												
113	**Potential UCL to Use**						Use 95% Student's-t UCL					5.029
114												

	General UCL Statistics for Data Sets with Non-Detects	
	User Selected Options	
	From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_
	Full Precision	OFF
	Confidence Coefficient	95%
	Number of Bootstrap Operations	2000

Sodium, dissolved (downstream)

General Statistics

Number of Valid Observations	39	Number of Distinct Observations	33

Raw Statistics		**Log-transformed Statistics**	
Minimum	75.6	Minimum of Log Data	4.325
Maximum	114	Maximum of Log Data	4.736
Mean	95.42	Mean of log Data	4.554
Median	95.8	SD of log Data	0.0997
SD	9.287		
Coefficient of Variation	0.0973		
Skewness	-0.295		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.968	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	97.93	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	102.1
95% Adjusted-CLT UCL	97.79	97.5% Chebyshev (MVUE) UCL	105
95% Modified-t UCL	97.92	99% Chebyshev (MVUE) UCL	110.6
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	97.16	**Data appear Normal at 5% Significance Level**	
Theta Star	0.982		
nu star	7578		
Approximate Chi Square Value (.05)	7377	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0437	95% CLT UCL	97.87
Adjusted Chi Square Value	7369	95% Jackknife UCL	97.93
		95% Standard Bootstrap UCL	97.88
Anderson-Darling Test Statistic	0.393	95% Bootstrap-t UCL	97.95
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	97.85
Kolmogorov-Smirnov Test Statistic	0.0791	95% Percentile Bootstrap UCL	97.87
Kolmogorov-Smirnov 5% Critical Value	0.141	95% BCA Bootstrap UCL	97.69
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	101.9
		97.5% Chebyshev(Mean, Sd) UCL	104.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	110.2
95% Approximate Gamma UCL	98.03		
95% Adjusted Gamma UCL	98.13		
Potential UCL to Use		Use 95% Student's-t UCL	97.93

Sodium, dissolved (upstream)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	80.8	Minimum of Log Data	4.392
Maximum	126	Maximum of Log Data	4.836
Mean	93.45	Mean of log Data	4.526
Median	89.05	SD of log Data	0.161
SD	16.57		
Coefficient of Variation	0.177		
Skewness	2.054		

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.743	Shapiro Wilk Test Statistic	0.786
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	107.1	95% H-UCL	108.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	120.1
95% Adjusted-CLT UCL	110.6	97.5% Chebyshev (MVUE) UCL	131.6
95% Modified-t UCL	108	99% Chebyshev (MVUE) UCL	154.3
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	21.97	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	4.254		
nu star	263.6		
Approximate Chi Square Value (.05)	227	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	104.6
Adjusted Chi Square Value	214.7	95% Jackknife UCL	107.1
		95% Standard Bootstrap UCL	103.6
Anderson-Darling Test Statistic	0.728	95% Bootstrap-t UCL	128.5
Anderson-Darling 5% Critical Value	0.697	95% Hall's Bootstrap UCL	148.6
Kolmogorov-Smirnov Test Statistic	0.351	95% Percentile Bootstrap UCL	105.3
Kolmogorov-Smirnov 5% Critical Value	0.332	95% BCA Bootstrap UCL	108

	A	B	C	D	E	F	G	H	I	J	K	L
107	**Data not Gamma Distributed at 5% Significance Level**						95% Chebyshev(Mean, Sd) UCL					122.9
108							97.5% Chebyshev(Mean, Sd) UCL					135.7
109	**Assuming Gamma Distribution**						99% Chebyshev(Mean, Sd) UCL					160.8
110	95% Approximate Gamma UCL					108.5						
111	95% Adjusted Gamma UCL					114.8						
112												
113	**Potential UCL to Use**						Use 95% Student's-t UCL					107.1
114							or 95% Modified-t UCL					108
115												

	General UCL Statistics for Data Sets with Non-Detects	
User Selected Options		
From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Sulfate (downstream)

General Statistics

Number of Valid Observations	39	Number of Distinct Observations	27

Raw Statistics		**Log-transformed Statistics**	
Minimum	220	Minimum of Log Data	5.394
Maximum	296	Maximum of Log Data	5.69
Mean	250	Mean of log Data	5.519
Median	253	SD of log Data	0.073
SD	18.19		
Coefficient of Variation	0.0728		
Skewness	0.0669		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.944	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	254.9	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	262.7
95% Adjusted-CLT UCL	254.8	97.5% Chebyshev (MVUE) UCL	268.3
95% Modified-t UCL	254.9	99% Chebyshev (MVUE) UCL	279.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	178.5	**Data appear Normal at 5% Significance Level**	
Theta Star	1.401		
nu star	13922		
Approximate Chi Square Value (.05)	13649	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0437	95% CLT UCL	254.8
Adjusted Chi Square Value	13638	95% Jackknife UCL	254.9
		95% Standard Bootstrap UCL	254.9
Anderson-Darling Test Statistic	0.734	95% Bootstrap-t UCL	254.7
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	254.7
Kolmogorov-Smirnov Test Statistic	0.122	95% Percentile Bootstrap UCL	254.9
Kolmogorov-Smirnov 5% Critical Value	0.141	95% BCA Bootstrap UCL	254.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	262.7
		97.5% Chebyshev(Mean, Sd) UCL	268.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	279
95% Approximate Gamma UCL	255		
95% Adjusted Gamma UCL	255.2		
Potential UCL to Use		Use 95% Student's-t UCL	254.9

Sulfate (upstream)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	215	Minimum of Log Data	5.371
Maximum	252	Maximum of Log Data	5.529
Mean	238	Mean of log Data	5.471
Median	240	SD of log Data	0.0555
SD	12.88		
Coefficient of Variation	0.0541		
Skewness	-1.226		

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,

the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Test Statistic	0.894
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	248.6	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	261.5
95% Adjusted-CLT UCL	243.8	97.5% Chebyshev (MVUE) UCL	271.7
95% Modified-t UCL	248.2	99% Chebyshev (MVUE) UCL	291.6
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	198.4	**Data appear Normal at 5% Significance Level**	
Theta Star	1.2		
nu star	2380		
Approximate Chi Square Value (.05)	2268	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	246.7
Adjusted Chi Square Value	2228	95% Jackknife UCL	248.6
		95% Standard Bootstrap UCL	246
Anderson-Darling Test Statistic	0.393	95% Bootstrap-t UCL	245.7
Anderson-Darling 5% Critical Value	0.696	95% Hall's Bootstrap UCL	244.5
Kolmogorov-Smirnov Test Statistic	0.239	95% Percentile Bootstrap UCL	245.2
Kolmogorov-Smirnov 5% Critical Value	0.332	95% BCA Bootstrap UCL	244.2

	A	B	C	D	E	F	G	H	I	J	K	L
107	**Data appear Gamma Distributed at 5% Significance Level**									95% Chebyshev(Mean, Sd) UCL		260.9
108										97.5% Chebyshev(Mean, Sd) UCL		270.8
109	**Assuming Gamma Distribution**									99% Chebyshev(Mean, Sd) UCL		290.3
110					95% Approximate Gamma UCL	249.8						
111					95% Adjusted Gamma UCL	254.3						
112												
113	**Potential UCL to Use**									Use 95% Student's-t UCL		248.6
114												

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Sulfide (downstream)											
10												
11	General Statistics											
12	Number of Valid Data			8		Number of Detected Data			1			
13	Number of Distinct Detected Data			1		Number of Non-Detect Data			7			
14						Percent Non-Detects			87.50%			
15												
16	Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!											
17	It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).											
18												
19	The data set for variable Sulfide (downstream) was not processed!											
20												
21												
22												
23	Sulfide (upstream)											
24												
25	General Statistics											
26	Number of Valid Data			5		Number of Detected Data			0			
27	Number of Distinct Detected Data			0		Number of Non-Detect Data			5			
28						Percent Non-Detects			100.00%			
29												
30	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!											
31	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!											
32	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
33												
34	The data set for variable Sulfide (upstream) was not processed!											
35												
36												

General UCL Statistics for Data Sets with Non-Detects		
User Selected Options		
From File	\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

Vanadium, dissolved (downstream)

General Statistics

Number of Valid Data	6	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	3
		Percent Non-Detects	50.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0022	Minimum Detected	-6.119
Maximum Detected	0.253	Maximum Detected	-1.374
Mean of Detected	0.0859	Mean of Detected	-4.509
SD of Detected	0.145	SD of Detected	2.715
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.751	Shapiro Wilk Test Statistic	0.764
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0454	Mean	-4.903
SD	0.102	SD	1.771
95% DL/2 (t) UCL	0.129	95% H-Stat (DL/2) UCL	2.88
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-5.204
		SD in Log Scale	2.088
		Mean in Original Scale	0.0454
		SD in Original Scale	0.102
		95% Percentile Bootstrap UCL	0.127
		95% BCA Bootstrap UCL	0.131
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	

54				k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**						
55				Theta Star	N/A							
56				nu star	N/A							
57												
58				A-D Test Statistic	0.58	**Nonparametric Statistics**						
59				5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method						
60				K-S Test Statistic	N/A	Mean						0.0441
61				5% K-S Critical Value	N/A	SD						0.0934
62				**Data not Gamma Distributed at 5% Significance Level**		SE of Mean						0.0467
63						95% KM (t) UCL						0.138
64				**Assuming Gamma Distribution**		95% KM (z) UCL						0.121
65				Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL						0.128
66				Minimum	N/A	95% KM (bootstrap t) UCL						39.13
67				Maximum	N/A	95% KM (BCA) UCL						0.253
68				Mean	N/A	95% KM (Percentile Bootstrap) UCL						0.253
69				Median	N/A	95% KM (Chebyshev) UCL						0.248
70				SD	N/A	97.5% KM (Chebyshev) UCL						0.336
71				k star	N/A	99% KM (Chebyshev) UCL						0.509
72				Theta star	N/A							
73				Nu star	N/A	**Potential UCLs to Use**						
74				AppChi2	N/A	99% KM (Chebyshev) UCL						0.509
75				95% Gamma Approximate UCL	N/A							
76				95% Adjusted Gamma UCL	N/A							
77	**Warning: Recommended UCL exceeds the maximum observation**											
78	**Note: DL/2 is not a recommended method.**											
79												
80												
81	**Vanadium, dissolved (upstream)**											
82												
83	**General Statistics**											
84				Number of Valid Data	4	Number of Detected Data						2
85				Number of Distinct Detected Data	2	Number of Non-Detect Data						2
86						Percent Non-Detects						50.00%
87												
88	**Warning: This data set only has 4 observations!**											
89	**Data set is too small to compute reliable and meaningful statistics and estimates!**											
90	**The data set for variable Vanadium, dissolved (upstream) was not processed!**											
91												
92	**It is suggested to collect at least 8 to 10 observations before using these statistical methods!**											
93	**If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.**											
94												
95												

1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			\\irisdata\iris\pg&e\topock\GW_Risk_Assessment\Data_Analysis\ProUCL_Input\Final Input Table\Surface_Water_								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Zinc, dissolved (downstream)											
10												
11	General Statistics											
12	Number of Valid Data			132		Number of Detected Data					103	
13	Number of Distinct Detected Data			77		Number of Non-Detect Data					29	
14						Percent Non-Detects					21.97%	
15												
16	Raw Statistics					Log-transformed Statistics						
17	Minimum Detected			0.0036		Minimum Detected					-5.627	
18	Maximum Detected			1.06		Maximum Detected					0.0583	
19	Mean of Detected			0.0753		Mean of Detected					-3.594	
20	SD of Detected			0.157		SD of Detected					1.374	
21	Minimum Non-Detect			0.005		Minimum Non-Detect					-5.298	
22	Maximum Non-Detect			0.053		Maximum Non-Detect					-2.937	
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended					Number treated as Non-Detect					95	
25	For all methods (except KM, DL/2, and ROS Methods),					Number treated as Detected					37	
26	Observations < Largest ND are treated as NDs					Single DL Non-Detect Percentage					71.97%	
27												
28	UCL Statistics											
29	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
30	Lilliefors Test Statistic			0.323		Lilliefors Test Statistic					0.126	
31	5% Lilliefors Critical Value			0.0873		5% Lilliefors Critical Value					0.0873	
32	Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level						
33												
34	Assuming Normal Distribution					Assuming Lognormal Distribution						
35	DL/2 Substitution Method					DL/2 Substitution Method						
36	Mean			0.0599		Mean					-4.027	
37	SD			0.141		SD					1.502	
38	95% DL/2 (t) UCL			0.0803		95% H-Stat (DL/2) UCL					0.0687	
39												
40	Maximum Likelihood Estimate(MLE) Method			N/A		Log ROS Method						
41	MLE yields a negative mean					Mean in Log Scale					-4.088	
42						SD in Log Scale					1.577	
43						Mean in Original Scale					0.0596	
44						SD in Original Scale					0.141	
45						95% Percentile Bootstrap UCL					0.0822	
46						95% BCA Bootstrap UCL					0.0896	
47												
48	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
49	k star (bias corrected)			0.6		Data do not follow a Discernable Distribution (0.05)						
50	Theta Star			0.125								
51	nu star			123.7								
52												
53	A-D Test Statistic			4.123		Nonparametric Statistics						

54				5% A-D Critical Value	0.808					Kaplan-Meier (KM) Method		
55				K-S Test Statistic	0.808					Mean		0.0599
56				5% K-S Critical Value	0.0931					SD		0.141
57				**Data not Gamma Distributed at 5% Significance Level**						SE of Mean		0.0123
58										95% KM (t) UCL		0.0803
59				**Assuming Gamma Distribution**						95% KM (z) UCL		0.0801
60				Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL		0.0802
61				Minimum	1E-09					95% KM (bootstrap t) UCL		0.101
62				Maximum	1.06					95% KM (BCA) UCL		0.0801
63				Mean	0.0601					95% KM (Percentile Bootstrap) UCL		0.081
64				Median	0.014					95% KM (Chebyshev) UCL		0.114
65				SD	0.141					97.5% KM (Chebyshev) UCL		0.137
66				k star	0.202					99% KM (Chebyshev) UCL		0.182
67				Theta star	0.297							
68				Nu star	53.39					**Potential UCLs to Use**		
69				AppChi2	37.6					95% KM (Chebyshev) UCL		0.114
70				95% Gamma Approximate UCL	0.0854							
71				95% Adjusted Gamma UCL	0.0857							
72	**Note: DL/2 is not a recommended method.**											
73												
74												
75	**Zinc, dissolved (upstream)**											
76												
77										**General Statistics**		
78				Number of Valid Data	38					Number of Detected Data		29
79				Number of Distinct Detected Data	26					Number of Non-Detect Data		9
80										Percent Non-Detects		23.68%
81												
82				**Raw Statistics**						**Log-transformed Statistics**		
83				Minimum Detected	0.0039					Minimum Detected		-5.547
84				Maximum Detected	0.308					Maximum Detected		-1.178
85				Mean of Detected	0.0602					Mean of Detected		-3.755
86				SD of Detected	0.0866					SD of Detected		1.423
87				Minimum Non-Detect	0.005					Minimum Non-Detect		-5.298
88				Maximum Non-Detect	0.0971					Maximum Non-Detect		-2.332
89												
90	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect		33
91	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		5
92	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		86.84%
93												
94										**UCL Statistics**		
95				**Normal Distribution Test with Detected Values Only**						**Lognormal Distribution Test with Detected Values Only**		
96				Shapiro Wilk Test Statistic	0.68					Shapiro Wilk Test Statistic		0.911
97				5% Shapiro Wilk Critical Value	0.926					5% Shapiro Wilk Critical Value		0.926
98				**Data not Normal at 5% Significance Level**						**Data not Lognormal at 5% Significance Level**		
99												
100				**Assuming Normal Distribution**						**Assuming Lognormal Distribution**		
101				DL/2 Substitution Method						DL/2 Substitution Method		
102				Mean	0.05					Mean		-3.999
103				SD	0.0781					SD		1.453
104				95% DL/2 (t) UCL	0.0714					95% H-Stat (DL/2) UCL		0.094
105												
106				Maximum Likelihood Estimate(MLE) Method						Log ROS Method		

107					Mean	0.237					Mean in Log Scale	-4.114
108					SD	0.0682					SD in Log Scale	1.446
109					95% MLE (t) UCL	0.256					Mean in Original Scale	0.0475
110					95% MLE (Tiku) UCL	0.288					SD in Original Scale	0.0788
111											95% Percentile Bootstrap UCL	0.0699
112											95% BCA Bootstrap UCL	0.0752
113												
114	**Gamma Distribution Test with Detected Values Only**										**Data Distribution Test with Detected Values Only**	
115					k star (bias corrected)	0.603					**Data do not follow a Discernable Distribution (0.05)**	
116					Theta Star	0.0999						
117					nu star	34.96						
118												
119					A-D Test Statistic	1.303					**Nonparametric Statistics**	
120					5% A-D Critical Value	0.795					Kaplan-Meier (KM) Method	
121					K-S Test Statistic	0.795					Mean	0.0482
122					5% K-S Critical Value	0.17					SD	0.0777
123	**Data not Gamma Distributed at 5% Significance Level**										SE of Mean	0.0129
124											95% KM (t) UCL	0.0699
125	**Assuming Gamma Distribution**										95% KM (z) UCL	0.0693
126					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0698
127					Minimum	1E-09					95% KM (bootstrap t) UCL	0.0781
128					Maximum	0.308					95% KM (BCA) UCL	0.0704
129					Mean	0.0512					95% KM (Percentile Bootstrap) UCL	0.0687
130					Median	0.014					95% KM (Chebyshev) UCL	0.104
131					SD	0.0779					97.5% KM (Chebyshev) UCL	0.129
132					k star	0.315					99% KM (Chebyshev) UCL	0.176
133					Theta star	0.163						
134					Nu star	23.9					**Potential UCLs to Use**	
135					AppChi2	13.78					97.5% KM (Chebyshev) UCL	0.129
136					95% Gamma Approximate UCL	0.0888						
137					95% Adjusted Gamma UCL	0.0909						
138	**Note: DL/2 is not a recommended method.**											
139												

Floodplain

Quantile p s

Non-parametric Quantile Hypothosis Test for Full Dataset (No NDs)		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\surface water\metropolitan\ProUCL_Input.wst	
Full Precision	OFF	
Confidence Coefficient	95%	
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)	
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration	

Area of Concern Data: Barium(downstream)

Background Data: Barium(upstream)

Raw Statistics

	Site	Background
Number of Valid Observations	30	15
Number of Distinct Observations	22	12
Minimum	128	130
Maximum	168	164
Mean	147.7	147.9
Median	149	148
SD	9.425	8.535
SE of Mean	1.721	2.204

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.045)	7
Approximate K Value (0.045)	7
R Value Adjusted for Ties in Data	9
K Value Adjusted for Ties in Data	9
Number of Site Observations in 'R' Largest	7
Calculated Alpha	0.0449

Conclusion with Alpha = 0.045

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney Ranked Sum Test

Non-parametric Quantile Hypothosis Test for Full Dataset (No NDs)

User Selected Options

From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\surface water\metropolitan\ProUCL_Input.wst
Full Precision	OFF
Confidence Coefficient	95%
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: Vanadium(downstream)

Background Data: Vanadium(upstream)

Raw Statistics

	Site	Background
Number of Valid Observations	28	14
Number of Distinct Observations	6	5
Minimum	2.2	2.2
Maximum	2.8	2.6
Mean	2.468	2.486
Median	2.5	2.5
SD	0.133	0.123
SE of Mean	0.0252	0.0329

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.045)	7
Approximate K Value (0.045)	7
R Value Adjusted for Ties in Data	13
K Value Adjusted for Ties in Data	13
Number of Site Observations in 'R' Largest	8
Calculated Alpha	0.0439

Conclusion with Alpha = 0.045

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney Ranked Sum Test

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Floodplain

Mann-Whitney Outputs

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\surface water\metropolitan\ProUCL_Input.wst	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Barium(downstream)

Background Data: Barium(upstream)

Raw Statistics

	Site	Background
Number of Valid Observations	30	15
Number of Distinct Observations	22	12
Minimum	128	130
Maximum	168	164
Mean	147.7	147.9
Median	149	148
SD	9.425	8.535
SE of Mean	1.721	2.204

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	690.5
WMW Test U-Stat	225.5
WMW Critical Value (0.050)	349
Approximate P-Value	0.5

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs		
User Selected Options		
From File	I:\pg&e\topock\GW_Risk_Assessment\Data_Analysis\surface water\metropolitan\ProUCL_Input.wst	
Full Precision	OFF	
Confidence Coefficient	95%	
Substantial Difference	0	
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)	
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median	

Area of Concern Data: Vanadium(downstream)

Background Data: Vanadium(upstream)

Raw Statistics

	Site	Background
Number of Valid Observations	28	14
Number of Distinct Observations	6	5
Minimum	2.2	2.2
Maximum	2.8	2.6
Mean	2.468	2.486
Median	2.5	2.5
SD	0.133	0.123
SE of Mean	0.0252	0.0329

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	577
WMW Test U-Stat	171
WMW Critical Value (0.050)	299
Approximate P-Value	0.752

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

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Appendix G

Groundwater Risk Assessment
Sensitivity Analysis

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Infrastructure, environment, buildings

Imagine the result

Pacific Gas and Electric Company

Appendix G – Groundwater Risk Assessment Sensitivity Analysis

HERA of Groundwater Impacted by Activities at
SWMU 1/AOC 1 and SWMU 2
Topock Compressor Station, Needles, California

November 2009

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Acronyms and Abbreviations

AOC	Area of Concern
CDI	chronic daily intake
COPC	constituent of potential concern
EPC	exposure point concentration
OTM	of the mean
SWMU	Solid Waste Management Unit
UCL	upper confidence limit

1. Introduction

This appendix documents a sensitivity analysis of the groundwater human health risk assessment presented in the Human and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2 (main text). Estimated exposure point concentrations (EPCs) of constituents of potential concern (COPCs) are altered from the assumptions used in the main text, as discussed below, for the well-specific groundwater analyses. Calculations here are otherwise based on the same exposure assessment, toxicity assessment, and risk characterization presented in Sections 5 through 7 of the main text.

2. Exposure Point Concentrations

In the groundwater risk assessment presented in the main text, estimated EPCs of COPCs in groundwater (see Table 4-2) are based on maximum detected concentrations, for those datasets with too few results (less than eight results or less than five detections) to calculate 95 percent upper confidence limits (95% UCLs) of the mean (OTM) with ProUCL 4.0. This methodology is particularly conservative for those datasets with a large number of nondetects and few detections.

Evaluated here is the sensitivity of the risk assessment to this conservative use of maximum concentrations. In this sensitivity analysis, estimated EPCs are based on average, rather than maximum, detected concentrations. For the purpose of calculating these average chemical concentrations, nondetect results are assumed equal to one-half the laboratory reporting limit. EPCs calculated by this alternative method are presented in Table G-1 for individual groundwater wells. The mean concentrations presented here are generally lower than the maximum concentrations presented in the main text, although mean concentrations may be greater than maximum concentrations for datasets with nondetect results at high reporting limits. As indicated in Table G-1, the mean concentration of thallium at the two wells where thallium was detected is greater than the maximum detected concentration due to elevated detection limits.

3. Well-Specific Risk Characterization

Well-specific carcinogenic and noncarcinogenic chronic daily intakes (CDIs) are presented in Tables G-2 and G-3, respectively. Well-specific estimated cancer risks and noncancer hazards are presented in Tables G-4 and G-5, respectively. A well-specific comparison of estimated lead EPCs to the lead drinking water notification level is presented in Table G-6. The percent contributions of individual COPCs to cumulative noncancer hazard are presented in Tables G-7.

Overall, the results of the well-specific sensitivity analysis presented in this appendix were generally similar to the results of the primary analysis in the main text, with the primary analysis providing slightly more conservative results. Nonetheless, for specific wells and specific chemicals, the results of the sensitivity analysis provide important information for understanding well-specific risk conclusions. Most importantly, although the main analysis indicated that lead should be considered to be a low to moderate potential hazard to hypothetical future groundwater users, the sensitivity analysis presented here indicates that lead would be a low potential hazard to hypothetical groundwater user. Information in these tables is integrated into the risk characterization discussion (Section 7 of the main report) in order to provide the risk managers with a better understanding of the range of hypothetical future risks and noncancer hazards estimated for each well.

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Tables

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
Aluminum							
CW-1D	8	1	0.118	0.118	0.0373	NA	0.037
MW-1	2	1	0.0686	0.0686	0.0468	NA	0.047
MW-10	6	2	0.0559	0.0645	0.0744	NA	0.074
MW-12	6	1	0.0679	0.0679	0.0702	NA	0.070
MW-3	2	1	0.0636	0.0636	0.0443	NA	0.044
MW-34-80	6	1	0.0605	0.0605	0.0688	NA	0.069
MW-4	2	1	0.0618	0.0618	0.0434	NA	0.043
MW-5	2	1	0.0585	0.0585	0.0418	NA	0.042
MW-6	2	1	0.0618	0.0618	0.0434	NA	0.043
OW-1M	15	1	0.111	0.111	0.0316	NA	0.032
OW-1S	13	1	0.118	0.118	0.0329	NA	0.033
OW-2S	13	3	0.0567	0.152	0.0410	NA	0.041
OW-5D	13	2	0.138	0.202	0.0661	NA	0.066
OW-5M	13	1	0.749	0.749	0.0815	NA	0.082
OW-5S	13	1	0.0991	0.0991	0.0315	NA	0.032
TW-2S	3	1	0.141	0.141	0.0637	NA	0.064

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
Antimony							
MW-10	15	1	0.0033	0.0033	0.00159	NA	0.0016
MW-12	17	2	0.013	0.0209	0.00324	NA	0.0032
MW-20-100	1	1	0.043	0.043	0.0430	NA	0.043
MW-20-70	13	1	0.0088	0.0088	0.00198	NA	0.0020
MW-34-55	9	1	0.026	0.026	0.00433	NA	0.0043
OW-5M	14	1	0.0111	0.0111	0.00229	NA	0.0023
TW-2D	3	1	0.155	0.155	0.0528	NA	0.053
TW-2S	3	1	0.153	0.153	0.0522	NA	0.052
Arsenic							
MW-12	17	17	0.052	0.157	0.0921	Y	0.11
MW-24A	4	3	0.0054	0.0336	0.0131	NA	0.013
MW-43-25	3	3	0.0189	0.0244	0.0221	NA	0.022
Barium							
MW-11	14	11	0.028	0.22	0.0833	Y	0.092
MW-22	7	3	0.11	0.5	0.209	NA	0.21
MW-23	8	3	0.089	5.3	0.827	NA	0.83
MW-24A	7	4	0.026	0.944	0.228	NA	0.23

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-24BR	4	3	0.19	0.3	0.235	NA	0.24
MW-27-20	4	3	0.069	0.26	0.170	NA	0.17
MW-28-25	4	3	0.12	0.24	0.190	NA	0.19
MW-29	4	3	0.034	0.3	0.158	NA	0.16
MW-30-30	5	4	0.083	1.1	0.381	NA	0.38
MW-32-20	1	1	5.14	5.14	5.14	NA	5.1
Beryllium							
CW-1D	7	1	0.0024	0.0024	0.00114	NA	0.0011
CW-2D	7	1	0.0024	0.0024	0.00114	NA	0.0011
CW-3D	7	1	0.0024	0.0024	0.00114	NA	0.0011
CW-3M	7	1	0.0019	0.0019	0.000986	NA	0.00099
CW-4D	7	1	0.002	0.002	0.00101	NA	0.0010
CW-4M	7	1	0.0016	0.0016	0.000950	NA	0.00095
MW-43-25	3	1	0.0011	0.0011	0.000700	NA	0.00070
OW-1D	15	2	0.0011	0.0028	0.00107	NA	0.0011
OW-1M	14	2	0.0012	0.0025	0.00103	NA	0.0010
OW-2D	14	2	0.0013	0.0023	0.00134	NA	0.0013
OW-2M	13	2	0.0011	0.0023	0.00131	NA	0.0013
OW-2S	13	1	0.0018	0.0018	0.00130	NA	0.0013
OW-5D	14	2	0.0014	0.0025	0.00104	NA	0.0010
OW-5M	14	2	0.0023	0.0088	0.00180	NA	0.0018

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
Cadmium							
OW-5M	14	1	0.0105	0.0105	0.00173	NA	0.0017
Chromium, hexavalent							
MW-10	37	37	0.755	4.57	1.84	Y	2.0
MW-11	34	34	0.02	1.71	0.599	Y	0.86
MW-12	40	40	0.311	2.97	1.16	Y	1.3
MW-14	37	36	0.01	0.099	0.0326	Y	0.044
MW-15	32	23	0.0076	0.05	0.0126	Y	0.016
MW-19	34	34	0.557	1.39	0.839	Y	0.90
MW-20-100	37	37	1.35	10.4	5.12	Y	7.4
MW-20-130	38	38	3.66	14.4	7.77	Y	8.5
MW-20-70	39	39	2.4	13.2	8.78	Y	9.7
MW-24A	32	32	2.48	4.3	3.24	Y	3.4
MW-24B	34	34	0.741	6.12	4.62	Y	4.9
MW-24BR	34	1	0.346	0.346	0.0129	NA	0.013
MW-25	33	33	0.933	2.98	2.19	Y	2.4
MW-26	35	34	0.759	4.06	2.94	Y	3.7
MW-30-50	45	34	0.0185	3.76	1.07	Y	1.3
MW-31-135	14	14	0.0332	0.422	0.221	Y	0.28
MW-31-60	36	36	0.626	4.52	3.03	Y	3.9
MW-34-100	79	79	0.0739	0.976	0.679	Y	0.71

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-35-135	14	13	0.0079	0.0354	0.0214	Y	0.026
MW-35-60	13	13	0.0048	0.0351	0.0274	Y	0.037
MW-36-100	51	51	0.157	2.98	1.03	Y	1.6
MW-36-90	39	38	0.002	3.66	0.711	Y	2.5
MW-37D	15	15	0.834	1.97	1.42	Y	1.6
MW-38D	11	11	0.0331	0.328	0.164	Y	0.22
MW-38S	11	11	0.332	0.964	0.781	Y	0.89
MW-39-100	41	41	1.66	12.9	5.54	Y	7.9
MW-39-50	18	12	0.0662	4.14	1.07	Y	1.7
MW-39-60	18	16	0.0011	3.81	1.43	Y	2.9
MW-39-70	27	27	0.0045	8.21	2.34	Y	4.3
MW-39-80	40	40	0.0433	10.9	3.03	Y	4.4
MW-40D	15	15	0.0076	0.112	0.0680	Y	0.083
MW-44-115	32	32	0.62	1.71	1.26	Y	1.3
MW-44-125	29	29	0.157	0.634	0.339	Y	0.38
MW-45-095a	3	3	0.169	0.259	0.208	NA	0.21
MW-46-175	29	29	0.0779	0.287	0.159	Y	0.18
MW-47-55	8	8	0.0109	0.0619	0.0418	Y	0.055
MW-50-095	8	8	0.164	0.304	0.241	Y	0.27
MW-50-200	8	8	5.81	12.3	9.56	Y	11
MW-51	7	7	4.13	4.69	4.51	NA	4.5

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-8	6	6	0.02	0.0509	0.0427	NA	0.043
MW-9	35	35	0.265	0.402	0.339	Y	0.35
OW-2S	16	15	0.0153	0.0404	0.0298	Y	0.040
OW-5S	16	16	0.0223	0.0326	0.0255	Y	0.027
PE-1	24	21	0.0471	0.148	0.0824	Y	0.10
PGE-6	18	13	0.16	3.1	0.776	Y	1.2
PGE-7	16	15	0.827	5.4	3.94	Y	5.6
PT-1D	2	2	2.47	3.08	2.78	NA	2.8
PT-2D	2	2	1.67	2.31	1.99	NA	2.0
PT-3D	2	2	4.39	4.44	4.42	NA	4.4
PT-4D	1	1	5.96	5.96	5.96	NA	6.0
PT-5D	2	1	6.15	6.15	3.08	NA	3.1
PT-6D	2	2	2.27	3.31	2.79	NA	2.8
PT-7D	1	1	7.26	7.26	7.26	NA	7.3
PT-7M	1	1	2.32	2.32	2.32	NA	2.3
PT-7S	1	1	1.2	1.2	1.20	NA	1.2
PT-8D	1	1	6.54	6.54	6.54	NA	6.5
PT-8M	1	1	3.96	3.96	3.96	NA	4.0
PT-8S	1	1	1.75	1.75	1.75	NA	1.8
PT-9D	1	1	15.7	15.7	15.7	NA	16
PT-9M	1	1	2.34	2.34	2.34	NA	2.3

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
PT-9S	1	1	1.18	1.18	1.18	NA	1.2
PTI-1D	1	1	3.35	3.35	3.35	NA	3.4
PTR-1	1	1	0.538	0.538	0.538	NA	0.54
PTR-2	1	1	3.19	3.19	3.19	NA	3.2
TW-1	3	3	3.82	4.61	4.14	NA	4.1
TW-2D	12	12	0.21	7.41	3.24	Y	5.5
TW-2S	10	10	1.25	7.19	3.79	Y	4.9
TW-3D	22	22	1.93	4.33	2.63	Y	2.8
TW-4	6	5	0.001	0.0355	0.0203	NA	0.020
Cobalt							
MW-14	2	1	0.00101	0.00101	0.000755	NA	0.00076
MW-20-130	12	1	0.00109	0.00109	0.000970	NA	0.00097
MW-22	3	1	0.005	0.005	0.00333	NA	0.0033
MW-33-210	1	1	0.00126	0.00126	0.00126	NA	0.0013
MW-34-80	13	5	0.00108	0.00139	0.00126	Y	0.0013
MW-37D	13	2	0.00106	0.00117	0.00106	NA	0.0011
OW-5M	14	1	0.01	0.01	0.00244	NA	0.0024
OW-5S	14	1	0.00125	0.00125	0.00185	NA	0.0019

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
Copper							
CW-4D	8	1	0.0154	0.0154	0.00455	NA	0.0046
CW-4M	8	2	0.00389	0.0218	0.00577	NA	0.0058
MW-10	39	16	0.00118	0.026	0.00479	Y	0.0049
MW-11	35	12	0.00122	0.019	0.0106	Y	0.0048
MW-12	41	14	0.0013	0.018	0.00942	Y	0.0049
MW-13	27	11	0.0016	0.011	0.0129	Y	0.0065
MW-14	26	12	0.00348	0.0297	0.00645	Y	0.0080
MW-15	24	7	0.00111	0.019	0.0146	Y	0.0093
MW-19	22	6	0.0016	0.0126	0.0142	Y	0.0065
MW-20-100	23	10	0.002	0.05	0.0163	Y	0.012
MW-20-130	34	10	0.00162	0.1	0.0133	Y	0.012
MW-20-70	36	16	0.00107	0.0785	0.0121	Y	0.011
MW-21	25	17	0.0047	0.111	0.0248	Y	0.027
MW-22	27	14	0.0033	0.2	0.0269	Y	0.078
MW-23	26	10	0.0031	0.1	0.0185	Y	0.019
MW-24A	25	10	0.0027	0.076	0.00874	Y	0.014
MW-24B	23	8	0.0026	0.019	0.0142	Y	0.0065

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-24BR	22	8	0.0025	0.0655	0.0189	Y	0.015
MW-25	29	7	0.00134	0.02	0.0122	Y	0.0076
MW-26	25	13	0.0037	0.0342	0.00746	Y	0.0094
MW-27-20	22	11	0.0033	0.0961	0.0110	Y	0.019
MW-28-25	21	10	0.0032	0.0269	0.00705	Y	0.0088
MW-29	22	12	0.0031	0.0187	0.0164	Y	0.0098
MW-30-30	22	11	0.0023	0.2	0.0247	Y	0.035
MW-30-50	6	1	0.0392	0.0392	0.0108	NA	0.011
MW-31-60	23	7	0.0037	0.05	0.0185	Y	0.015
MW-33-40	6	1	0.0189	0.0189	0.00743	NA	0.0074
MW-33-90	6	1	0.306	0.306	0.0546	NA	0.055
MW-34-55	14	2	0.0066	0.012	0.00434	NA	0.0043
MW-34-80	18	4	0.0011	0.0106	0.00369	NA	0.0037
MW-8	5	2	0.00211	0.0114	0.00570	NA	0.0057
MW-9	27	17	0.0024	0.0167	0.00702	Y	0.0073
OW-1D	15	3	0.00252	0.0216	0.00532	NA	0.0053
OW-1M	15	2	0.00241	0.021	0.00463	NA	0.0046
OW-2D	14	4	0.00103	0.0186	0.00497	NA	0.0050

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
OW-2M	13	1	0.0206	0.0206	0.00478	NA	0.0048
OW-5D	14	4	0.00294	0.015	0.00483	NA	0.0048
OW-5S	14	4	0.00114	0.015	0.00451	NA	0.0045
PGE-6	17	10	0.0034	0.047	0.00949	Y	0.014
PGE-7	15	4	0.0026	0.0192	0.0188	NA	0.019
Fluoride							
CW-2D	8	7	0.982	7.26	2.96	Y	4.4
MW-1	7	7	0.735	7.95	2.12	NA	2.1
MW-10	6	6	10	24.6	16.2	NA	16
MW-33-40	3	3	8.2	8.78	8.53	NA	8.5
MW-6	6	6	6.87	8.6	7.90	NA	7.9
Lead							
CW-1D	8	1	0.0036	0.0036	0.00139	NA	0.0014
CW-1M	8	1	0.0054	0.0054	0.00156	NA	0.0016
CW-2M	8	1	0.0067	0.0067	0.00172	NA	0.0017
CW-3M	8	1	0.0029	0.0029	0.00131	NA	0.0013
CW-4M	8	1	0.0055	0.0055	0.00163	NA	0.0016
MW-10	17	6	0.00106	0.008	0.00182	Y	0.0025

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-11	13	3	0.00083	0.006	0.00144	NA	0.0014
MW-12	20	4	0.001	0.0067	0.00176	NA	0.0018
MW-14	6	3	0.00138	0.0026	0.00326	NA	0.0033
MW-15	4	2	0.00127	0.0039	0.00254	NA	0.0025
MW-20-100	4	2	0.00094	0.017	0.00574	NA	0.0057
MW-20-130	15	1	0.042	0.042	0.00377	NA	0.0038
MW-20-70	16	3	0.00137	0.003	0.00125	NA	0.0013
MW-22	5	1	0.076	0.076	0.0163	NA	0.016
MW-23	6	2	0.00426	0.027	0.00638	NA	0.0064
MW-26	6	1	0.0021	0.0021	0.00193	NA	0.0019
MW-27-20	3	3	0.0017	0.024	0.00970	NA	0.0097
MW-28-25	3	2	0.0038	0.014	0.00677	NA	0.0068
MW-29	3	1	0.0033	0.0033	0.00277	NA	0.0028
MW-30-30	4	2	0.067	0.073	0.0381	NA	0.038
MW-31-60	5	1	0.021	0.021	0.00551	NA	0.0055
MW-34-55	9	1	0.0122	0.0122	0.00236	NA	0.0024
MW-43-25	3	1	0.0059	0.0059	0.00247	NA	0.0025
MW-51	3	1	0.0058	0.0058	0.00260	NA	0.0026

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-9	5	2	0.002	0.00317	0.00224	NA	0.0022
OW-1M	15	1	0.0049	0.0049	0.00132	NA	0.0013
OW-1S	13	2	0.0026	0.0047	0.00138	NA	0.0014
OW-2D	14	2	0.0024	0.0029	0.00129	NA	0.0013
OW-2M	13	1	0.0032	0.0032	0.00123	NA	0.0012
OW-3D	2	1	0.0024	0.0024	0.00173	NA	0.0017
OW-3S	3	1	0.0046	0.0046	0.00205	NA	0.0021
OW-5D	14	1	0.0037	0.0037	0.00125	NA	0.0013
OW-5M	14	1	0.0102	0.0102	0.00171	NA	0.0017
OW-5S	14	1	0.0028	0.0028	0.00119	NA	0.0012
PGE-6	3	1	0.006	0.006	0.00367	NA	0.0037
TW-1	4	1	0.0051	0.0051	0.00204	NA	0.0020
Mercury							
MW-22	3	1	0.0004	0.0004	0.000200	NA	0.00020
Molybdenum							
CW-1D	8	8	0.012	0.0518	0.0303	Y	0.040
CW-2D	8	8	0.0339	0.0732	0.0527	Y	0.061
CW-3D	8	8	0.0292	0.0882	0.0522	Y	0.065

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
CW-3M	8	8	0.0154	0.0378	0.0248	Y	0.030
CW-4D	8	8	0.0218	0.0442	0.0365	Y	0.042
MW-1	12	3	0.0057	0.078	0.0110	NA	0.011
MW-10	17	17	0.0683	0.301	0.140	Y	0.17
MW-12	20	20	0.019	0.087	0.0461	Y	0.054
MW-20-130	15	15	0.018	0.0576	0.0435	Y	0.048
MW-21	6	5	0.0239	0.052	0.0304	NA	0.030
MW-22	6	5	0.031	0.0562	0.0343	NA	0.034
MW-24A	5	5	0.011	0.0397	0.0233	NA	0.023
MW-24B	3	3	0.053	0.0649	0.0603	NA	0.060
MW-24BR	2	2	0.036	0.058	0.0470	NA	0.047
MW-26	6	6	0.0288	0.043	0.0328	NA	0.033
MW-3	12	11	0.025	0.041	0.0309	Y	0.034
MW-30-30	4	2	0.011	0.1	0.0309	NA	0.031
MW-33-90	1	1	0.0369	0.0369	0.0369	NA	0.037
MW-34-100	2	2	0.0362	0.0367	0.0365	NA	0.037
MW-37D	13	13	0.034	0.0518	0.0444	Y	0.047
MW-38D	1	1	0.0797	0.0797	0.0797	NA	0.080

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-38S	1	1	0.0637	0.0637	0.0637	NA	0.064
MW-40D	1	1	0.0458	0.0458	0.0458	NA	0.046
MW-44-115	3	3	0.0729	0.0856	0.0805	NA	0.081
MW-44-125	1	1	0.125	0.125	0.125	NA	0.13
MW-46-175	1	1	0.196	0.196	0.196	NA	0.20
MW-5	12	11	0.039	0.15	0.0505	Y	0.091
MW-50-200	3	3	0.0404	0.054	0.0462	NA	0.046
MW-51	3	3	0.0336	0.04	0.0371	NA	0.037
OW-1D	17	17	0.0088	0.0518	0.0267	Y	0.032
OW-2D	16	16	0.0082	0.0665	0.0205	Y	0.041
OW-2S	15	15	0.029	0.0893	0.0414	Y	0.048
OW-3D	2	2	0.031	0.0437	0.0374	NA	0.037
OW-5D	16	16	0.0118	0.0838	0.0349	Y	0.048
OW-5M	16	16	0.0098	0.0501	0.0266	Y	0.032
PGE-7	2	2	0.054	0.056	0.0550	NA	0.055
PGE-8	3	3	0.056	0.078	0.0693	NA	0.069
TW-2D	3	3	0.0332	0.05	0.0427	NA	0.043

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
Nickel							
MW-1	5	4	0.00671	0.023	0.0120	NA	0.012
MW-10	39	20	0.00165	0.033	0.00756	Y	0.0067
MW-11	35	16	0.00096	0.0203	0.00744	Y	0.0070
MW-12	41	20	0.0013	0.0179	0.00731	Y	0.0063
MW-13	27	19	0.0035	0.168	0.0154	Y	0.027
MW-14	26	17	0.0013	0.0397	0.0113	Y	0.013
MW-15	24	14	0.0014	0.028	0.00877	Y	0.0079
MW-19	22	10	0.0012	0.0202	0.00871	Y	0.0076
MW-20-100	23	13	0.0011	0.13	0.0139	Y	0.023
MW-20-130	34	14	0.00079	0.25	0.0204	Y	0.033
MW-20-70	36	15	0.0012	0.029	0.00764	Y	0.0070
MW-21	25	20	0.0017	0.158	0.0217	Y	0.049
MW-22	27	17	0.0013	0.5	0.0343	Y	0.15
MW-23	26	15	0.0015	0.25	0.0235	Y	0.082
MW-24A	25	11	0.0013	0.0225	0.00817	Y	0.0066
MW-24B	23	12	0.00069	0.053	0.0188	Y	0.012
MW-24BR	22	11	0.0017	0.0172	0.00837	Y	0.0076

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-25	29	15	0.00122	0.0213	0.00720	Y	0.0058
MW-26	25	11	0.0014	0.0183	0.00955	Y	0.0099
MW-27-20	22	12	0.0014	0.11	0.0151	Y	0.047
MW-28-25	21	10	0.0022	0.0206	0.00943	Y	0.0089
MW-29	22	14	0.0015	0.0213	0.00923	Y	0.010
MW-3	5	5	0.0125	0.042	0.0302	NA	0.030
MW-30-30	22	15	0.0017	0.5	0.0467	Y	0.26
MW-31-60	23	12	0.0017	0.13	0.0121	Y	0.044
MW-34-55	14	6	0.00122	0.0223	0.00865	Y	0.011
MW-34-80	18	11	0.001	0.0222	0.00742	Y	0.0081
MW-37D	13	4	0.0015	0.0254	0.00553	NA	0.0055
MW-4	5	5	0.00774	0.022	0.0162	NA	0.016
MW-5	5	4	0.00497	0.02	0.0114	NA	0.011
MW-7	5	5	0.00529	0.02	0.0115	NA	0.012
MW-8	5	4	0.00246	0.016	0.00924	NA	0.0092
MW-9	27	15	0.0014	0.0297	0.00814	Y	0.0080
OW-2D	14	3	0.00102	0.0135	0.00694	NA	0.0069

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
OW-5M	14	4	0.00128	0.0201	0.00747	NA	0.0075
PGE-6	17	10	0.00091	0.014	0.0185	Y	0.0063
PGE-7	15	9	0.0015	0.015	0.0202	Y	0.0077
PGE-8	17	9	0.0012	0.045	0.0221	Y	0.013
Nitrate as nitrogen							
CW-3M	8	8	0.594	5.98	1.39	Y	4.3
MW-1	2	2	6.16	6.28	6.22	NA	6.2
MW-10	7	7	3.81602	16.1	9.65	NA	9.7
MW-11	8	8	0.51934	16.4	6.90	Y	10
MW-14	8	8	1.10642	5.74	3.88	Y	7.3
MW-15	7	7	0.72256	9.73	3.97	NA	4.0
MW-20-100	19	19	2.9354	23.2	9.50	Y	14
MW-20-130	19	19	6.0966	20.4	10.0	Y	11
MW-20-70	20	20	2.4838	25.1	10.5	Y	12
MW-22	8	3	2.9354	6.75142	2.36	NA	2.4
MW-24A	7	7	3.47732	18.3	11.2	NA	11
MW-24B	8	8	3.1612	16	11.0	Y	14
MW-26	17	17	1.33222	7.84	4.68	Y	5.4

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-3	2	2	9	11	10.0	NA	10
MW-30-30	16	3	10.161	14.40604	9.56	NA	9.6
MW-31-60	17	17	1.78382	6.2	4.47	Y	5.0
MW-38D	4	4	0.697	14.7	4.39	NA	4.4
MW-38S	4	4	8.73	10.5	9.81	NA	9.8
MW-39-100	4	3	2.68	9.8	4.30	NA	4.3
MW-39-50	3	1	6.3	6.3	2.35	NA	2.4
MW-39-60	4	1	6.3	6.3	1.83	NA	1.8
MW-39-70	4	1	9	9	2.50	NA	2.5
MW-39-80	4	3	0.931	8.9	4.58	NA	4.6
MW-4	2	2	5.49	6.28	5.89	NA	5.9
MW-40D	3	3	1	19.7	7.68	NA	7.7
MW-40S	3	3	4.6	6.6	5.86	NA	5.9
MW-44-125	2	2	1.72	6.43	4.08	NA	4.1
MW-5	2	2	14.8	18.9	16.9	NA	17
MW-50-200	1	1	6.06	6.06	6.06	NA	6.1
MW-51	1	1	14.1	14.1	14.1	NA	14
MW-7	2	2	7.06	7.83	7.45	NA	7.5

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-8	2	2	15	20.5	17.8	NA	18
MW-9	7	7	1.62576	22.6	7.92	NA	7.9
OW-2D	15	14	0.107	7.57	2.95	Y	4.8
OW-2M	15	15	0.574	7.16	2.80	Y	3.5
OW-2S	14	14	3.24	7.75	4.38	Y	4.9
OW-5S	15	15	1.74	7.67	3.85	Y	4.5
Park Moabi-4	2	2	2.8	25.9	14.4	NA	14
PGE-7	3	3	5.1934	10.3868	7.78	NA	7.8
PT-7D	1	1	7.41	7.41	7.41	NA	7.4
PT-7M	1	1	25.2	25.2	25.2	NA	25
PT-7S	1	1	22	22	22.0	NA	22
PT-8D	1	1	9.72	9.72	9.72	NA	9.7
PT-8M	1	1	31.8	31.8	31.8	NA	32
PT-8S	1	1	25.1	25.1	25.1	NA	25
PT-9D	1	1	9.3	9.3	9.30	NA	9.3
PT-9M	1	1	24.6	24.6	24.6	NA	25
PT-9S	1	1	16.4	16.4	16.4	NA	16
PTR-1	1	1	18.4	18.4	18.4	NA	18

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
PTR-2	1	1	25.8	25.8	25.8	NA	26
TW-1	1	1	5.42	5.42	5.42	NA	5.4
TW-2S	2	2	5.3	6.71	6.01	NA	6.0
Selenium							
MW-10	14	10	0.00193	0.02	0.00518	Y	0.0075
MW-11	10	7	0.0045	0.0136	0.00593	Y	0.0081
MW-20-130	12	11	0.0107	0.023	0.0134	Y	0.016
MW-20-70	13	9	0.007829999	0.0181	0.00903	Y	0.012
MW-21	4	4	0.012	0.038	0.0240	NA	0.024
MW-23	4	4	0.00544	0.0109	0.00715	NA	0.0072
MW-24A	3	2	0.00529	0.0507	0.0195	NA	0.020
MW-24B	1	1	0.0143	0.0143	0.0143	NA	0.014
MW-25	10	7	0.00204	0.0131	0.00401	Y	0.0057
MW-26	3	3	0.0144	0.0168	0.0153	NA	0.015
MW-34-55	9	1	0.0125	0.0125	0.00356	NA	0.0036
MW-5	2	2	0.0173	0.0203	0.0188	NA	0.019
MW-51	3	3	0.0115	0.0182	0.0154	NA	0.015
MW-9	2	2	0.00622	0.0132	0.00971	NA	0.0097

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
OW-5M	14	3	0.00236	0.0186	0.00402	NA	0.0040
TW-1	4	4	0.0553	0.155	0.107	NA	0.11
TW-2S	3	1	0.02	0.02	0.00850	NA	0.0085
Silver							
MW-10	14	1	0.0618	0.0618	0.00538	NA	0.0054
MW-34-55	9	1	0.0404	0.0404	0.00549	NA	0.0055
MW-9	1	1	0.0059	0.0059	0.00590	NA	0.0059
OW-2D	14	1	0.0085	0.0085	0.00229	NA	0.0023
OW-5M	14	1	0.02	0.02	0.00315	NA	0.0032
OW-5S	14	1	0.0649	0.0649	0.00632	NA	0.0063
TW-1	4	2	0.0122	0.0873	0.0261	NA	0.026
Thallium							
CW-3D	7	1	0.0012	0.0012	0.00268	NA	0.0027
MW-12	17	1	0.00111	0.00111	0.00257	NA	0.0026
Vanadium							
CW-1D	7	6	0.00416	0.0893	0.0230	NA	0.023
CW-1M	7	6	0.00357	0.0977	0.0219	NA	0.022
CW-2D	7	6	0.00545	0.121	0.0291	NA	0.029

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
CW-2M	7	6	0.00417	0.124	0.0260	NA	0.026
CW-3D	7	6	0.00219	0.115	0.0255	NA	0.026
CW-3M	7	6	0.00224	0.0983	0.0217	NA	0.022
CW-4D	7	6	0.00284	0.109	0.0216	NA	0.022
CW-4M	7	6	0.0034	0.0953	0.0192	NA	0.019
MW-10	17	17	0.02	0.165	0.0443	Y	0.059
MW-12	20	20	0.009	0.218	0.0401	Y	0.082
MW-20-130	15	11	0.0028	0.172	0.0222	Y	0.10
MW-20-70	16	15	0.0034	0.117	0.0215	Y	0.058
MW-22	6	2	0.044	0.179	0.0393	NA	0.039
MW-30-30	4	1	0.2	0.2	0.0540	NA	0.054
MW-31-60	5	4	0.0058	0.118	0.0372	NA	0.037
MW-34-55	9	5	0.00115	0.227	0.0278	Y	0.29
OW-1D	15	14	0.00169	0.122	0.0221	Y	0.075
OW-5D	14	11	0.00166	0.0966	0.0198	Y	0.072
OW-5M	14	12	0.00181	0.122	0.0209	Y	0.061

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
Zinc							
CW-1D	8	4	0.0185	0.113	0.0383	NA	0.038
CW-1M	8	3	0.019	0.248	0.0484	NA	0.048
CW-2M	8	3	0.0272	0.215	0.0388	NA	0.039
MW-10	39	28	0.0053	0.637	0.0580	Y	0.18
MW-11	35	26	0.0053	0.45	0.0570	Y	0.18
MW-13	27	23	0.0068	0.451	0.0796	Y	0.22
MW-14	26	24	0.008	0.498	0.0800	Y	0.18
MW-15	24	21	0.004	0.419	0.0616	Y	0.19
MW-19	22	19	0.011	0.398	0.0764	Y	0.22
MW-20-100	23	21	0.0065	0.486	0.0924	Y	0.19
MW-20-130	34	27	0.0102	0.445	0.0798	Y	0.11
MW-20-70	36	28	0.0112	0.53	0.0730	Y	0.20
MW-21	25	20	0.0053	0.692	0.148	Y	0.33
MW-22	27	22	0.0068	0.734	0.0763	Y	0.20
MW-23	26	22	0.0066	0.817	0.106	Y	0.27
MW-24A	25	21	0.0056	0.62	0.0893	Y	0.21
MW-24B	23	20	0.0096	0.468	0.0775	Y	0.23

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
MW-24BR	22	19	0.009	0.152	0.0610	Y	0.079
MW-25	29	23	0.0073	0.555	0.0717	Y	0.17
MW-26	25	23	0.0088	0.514	0.0988	Y	0.21
MW-27-20	22	18	0.0053	0.44	0.0774	Y	0.18
MW-28-25	21	19	0.0053	0.286	0.0606	Y	0.15
MW-29	22	21	0.0049	0.356	0.0751	Y	0.17
MW-30-30	22	18	0.008	0.597	0.0637	Y	0.18
MW-30-50	6	5	0.0467	0.365	0.130	NA	0.13
MW-31-60	23	21	0.0073	0.274	0.0755	Y	0.15
MW-32-20	6	5	0.0359	0.0857	0.0631	NA	0.063
MW-32-35	9	5	0.0398	0.381	0.139	Y	0.32
MW-33-40	6	4	0.0331	0.171	0.0622	NA	0.062
MW-33-90	6	5	0.017	0.315	0.115	NA	0.12
MW-9	27	26	0.0034	0.363	0.0787	Y	0.21
Park Moabi-4	1	1	0.605	0.605	0.605	NA	0.61
PGE-6	17	16	0.0067	1.5	0.134	Y	0.67
PGE-7	15	15	0.01	0.125	0.0379	Y	0.052
PGE-8	17	17	0.015	0.82	0.177	Y	0.31

Table G-1. Estimated EPCs of Well-Specific COPCs in Groundwater: Sensitivity Analysis

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Mean Concentration (mg/L)	Result of Statistical Analysis	Estimated EPC (mg/L)
TW-1	4	4	0.0386	0.11	0.0804	NA	0.080
TW-2S	3	2	0.05	0.217	0.0907	NA	0.091

Notes:

(1) Data shown here fit one of two criteria

(a) For data with eight or more samples and five or more detections, statistical hypothesis tests conducted are presented in Table 4-1a to confirm the concentration in the well is greater than the background concentration. For these wells, the 95% UCL OTM calculated using ProUCL is used as the EPC.

(b) For data with fewer samples or detections, the maximum detected chemical concentration at individual wells exceed the UTL. For these wells the mean concentration is used as the EPC.

(2) Non-detects are assumed equal to one-half the reporting limit in calculating mean concentrations.

(3) Nitrate as NO_3^-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

COPC = constituent of potential concern
EPC = exposure point concentration
mg/L = milligram's) per liter
NA = not applicable – data do not meet minimum criteria to perform statistical tests
OTM = of the mean
UCL = upper confidence limit
UTL = upper tolerance limit
Y = statistical tests conclude site concentration is greater than background concentration

Table G-2. Groundwater CDIs – Well-Specific – Carcinogenic Effects: Sensitivity Analysis

Constituent of Potential Concern	Groundwater CDI – Carcinogenic Effects (mg/kg/d)					
	On-Site Resident Child		On-Site Resident Adult		On-Site Resident Age-Adjusted	
	Dermal Contact	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-12						
Aluminum	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC
Arsenic	3.8E-06	5.8E-04	6.5E-06	1.2E-03	9.0E-06	1.6E-03
Barium	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC

Table G-2. Groundwater CDIs – Well-Specific – Carcinogenic Effects: Sensitivity Analysis

Constituent of Potential Concern	Groundwater CDI – Carcinogenic Effects (mg/kg/d)					
	On-Site Resident Child		On-Site Resident Adult		On-Site Resident Age-Adjusted	
	Dermal Contact	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-24A						
Aluminum	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC
Arsenic	4.7E-07	7.2E-05	8.0E-07	1.5E-04	1.1E-06	1.9E-04
Barium	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC

Table G-2. Groundwater CDIs – Well-Specific – Carcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Carcinogenic Effects (mg/kg/d)					
	On-Site Resident Child		On-Site Resident Adult		On-Site Resident Age-Adjusted	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-43-25						
Aluminum	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC
Arsenic	8.0E-07	1.2E-04	1.4E-06	2.6E-04	1.9E-06	3.3E-04
Barium	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC

Table G-2. Groundwater CDIs – Well-Specific – Carcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Carcinogenic Effects (mg/kg/d)					
	On-Site Resident Child		On-Site Resident Adult		On-Site Resident Age-Adjusted	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Ingestion

Notes:

CDI = chronic daily intake

mg/kg/d = milligrams per kilogram per day

NC = noncarcinogenic compound

ND = not detected or not detected above background concentrations

NS = not sampled

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-1				
Aluminum	2.0E-05	3.0E-03	6.7E-06	1.3E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	8.9E-04	1.4E-01	3.0E-04	5.8E-02
Mercury	ND	ND	ND	ND
Molybdenum	4.6E-06	7.0E-04	1.6E-06	3.0E-04
Nickel	1.0E-06	7.7E-04	3.4E-07	3.3E-04
Nitrate as nitrogen	2.6E-03	4.0E-01	8.9E-04	1.7E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-3				
Aluminum	1.9E-05	2.8E-03	6.3E-06	1.2E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.4E-05	2.2E-03	4.9E-06	9.4E-04
Nickel	2.5E-06	1.9E-03	8.6E-07	8.3E-04
Nitrate as nitrogen	4.2E-03	6.4E-01	1.4E-03	2.7E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-4				
Aluminum	1.8E-05	2.8E-03	6.2E-06	1.2E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	1.4E-06	1.0E-03	4.6E-07	4.4E-04
Nitrate as nitrogen	2.5E-03	3.8E-01	8.4E-04	1.6E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-5				
Aluminum	1.8E-05	2.7E-03	6.0E-06	1.1E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	3.9E-05	5.8E-03	1.3E-05	2.5E-03
Nickel	9.6E-07	7.3E-04	3.3E-07	3.1E-04
Nitrate as nitrogen	7.1E-03	1.1E+00	2.4E-03	4.6E-01
Selenium	7.9E-06	1.2E-03	2.7E-06	5.2E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-6				
Aluminum	1.8E-05	2.8E-03	6.2E-06	1.2E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	3.3E-03	5.1E-01	1.1E-03	2.2E-01
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-7				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	9.7E-07	7.4E-04	3.3E-07	3.2E-04
Nitrate as nitrogen	3.1E-03	4.8E-01	1.1E-03	2.0E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-8				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.6E-05	2.7E-03	1.2E-05	1.2E-03
Cobalt	ND	ND	ND	ND
Copper	2.4E-06	3.6E-04	8.2E-07	1.6E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	7.8E-07	5.9E-04	2.6E-07	2.5E-04
Nitrate as nitrogen	7.5E-03	1.1E+00	2.5E-03	4.9E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-9				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.9E-04	2.2E-02	1.0E-04	9.5E-03
Cobalt	ND	ND	ND	ND
Copper	3.1E-06	4.7E-04	1.0E-06	2.0E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	6.8E-07	5.1E-04	2.3E-07	2.2E-04
Nitrate as nitrogen	3.3E-03	5.1E-01	1.1E-03	2.2E-01
Selenium	4.1E-06	6.2E-04	1.4E-06	2.7E-04
Silver	1.5E-06	3.8E-04	5.1E-07	1.6E-04
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.2E-05	1.3E-02	1.8E-05	5.6E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-10				
Aluminum	3.1E-05	4.8E-03	1.1E-05	2.0E-03
Antimony	6.7E-07	1.0E-04	2.3E-07	4.4E-05
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	1.7E-03	1.3E-01	5.8E-04	5.6E-02
Cobalt	ND	ND	ND	ND
Copper	2.1E-06	3.1E-04	7.0E-07	1.3E-04
Fluoride	6.8E-03	1.0E+00	2.3E-03	4.4E-01
Mercury	ND	ND	ND	ND
Molybdenum	7.0E-05	1.1E-02	2.4E-05	4.6E-03
Nickel	5.6E-07	4.3E-04	1.9E-07	1.8E-04
Nitrate as nitrogen	4.1E-03	6.2E-01	1.4E-03	2.6E-01
Selenium	3.2E-06	4.8E-04	1.1E-06	2.1E-04
Silver	1.4E-06	3.4E-04	4.6E-07	1.5E-04
Thallium	ND	ND	ND	ND
Vanadium	2.5E-05	3.8E-03	8.4E-06	1.6E-03
Zinc	4.6E-05	1.2E-02	1.6E-05	5.0E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-11				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	3.9E-05	5.9E-03	1.3E-05	2.5E-03
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	7.3E-04	5.5E-02	2.5E-04	2.4E-02
Cobalt	ND	ND	ND	ND
Copper	2.0E-06	3.1E-04	6.9E-07	1.3E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	5.9E-07	4.4E-04	2.0E-07	1.9E-04
Nitrate as nitrogen	4.4E-03	6.7E-01	1.5E-03	2.9E-01
Selenium	3.4E-06	5.2E-04	1.2E-06	2.2E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	4.5E-05	1.1E-02	1.5E-05	4.9E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-12				
Aluminum	3.0E-05	4.5E-03	1.0E-05	1.9E-03
Antimony	1.4E-06	2.1E-04	4.6E-07	8.9E-05
Arsenic	4.5E-05	6.8E-03	1.5E-05	2.9E-03
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	1.1E-03	8.6E-02	3.8E-04	3.7E-02
Cobalt	ND	ND	ND	ND
Copper	2.1E-06	3.2E-04	7.1E-07	1.4E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.3E-05	3.5E-03	7.8E-06	1.5E-03
Nickel	5.3E-07	4.0E-04	1.8E-07	1.7E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	1.1E-06	1.6E-04	3.7E-07	7.0E-05
Vanadium	3.5E-05	5.2E-03	1.2E-05	2.2E-03
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-13				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	2.7E-06	4.1E-04	9.3E-07	1.8E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	2.3E-06	1.7E-03	7.7E-07	7.4E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.5E-05	1.4E-02	1.9E-05	5.9E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-14				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.7E-05	2.8E-03	1.2E-05	1.2E-03
Cobalt	3.2E-07	4.8E-05	1.1E-07	2.1E-05
Copper	3.4E-06	5.1E-04	1.1E-06	2.2E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	1.1E-06	8.6E-04	3.8E-07	3.7E-04
Nitrate as nitrogen	3.1E-03	4.7E-01	1.0E-03	2.0E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	4.5E-05	1.1E-02	1.5E-05	4.8E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-15				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.4E-05	1.0E-03	4.7E-06	4.5E-04
Cobalt	NS	NS	NS	NS
Copper	3.9E-06	6.0E-04	1.3E-06	2.6E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	6.6E-07	5.0E-04	2.3E-07	2.2E-04
Nitrate as nitrogen	1.7E-03	2.5E-01	5.7E-04	1.1E-01
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	4.8E-05	1.2E-02	1.6E-05	5.2E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-19				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	7.6E-04	5.8E-02	2.6E-04	2.5E-02
Cobalt	ND	ND	ND	ND
Copper	2.8E-06	4.2E-04	9.4E-07	1.8E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	6.4E-07	4.8E-04	2.2E-07	2.1E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.5E-05	1.4E-02	1.9E-05	6.0E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-20-70				
Aluminum	ND	ND	ND	ND
Antimony	8.4E-07	1.3E-04	2.8E-07	5.4E-05
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	8.1E-03	6.2E-01	2.8E-03	2.6E-01
Cobalt	ND	ND	ND	ND
Copper	4.6E-06	6.9E-04	1.5E-06	3.0E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	5.9E-07	4.5E-04	2.0E-07	1.9E-04
Nitrate as nitrogen	5.2E-03	7.9E-01	1.8E-03	3.4E-01
Selenium	5.0E-06	7.5E-04	1.7E-06	3.2E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	2.4E-05	3.7E-03	8.3E-06	1.6E-03
Zinc	5.0E-05	1.3E-02	1.7E-05	5.4E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-20-100				
Aluminum	NS	NS	NS	NS
Antimony	1.8E-05	2.7E-03	6.1E-06	1.2E-03
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	6.2E-03	4.7E-01	2.1E-03	2.0E-01
Cobalt	ND	ND	ND	ND
Copper	4.9E-06	7.4E-04	1.6E-06	3.2E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	1.9E-06	1.5E-03	6.5E-07	6.2E-04
Nitrate as nitrogen	5.9E-03	9.0E-01	2.0E-03	3.9E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	4.9E-05	1.2E-02	1.6E-05	5.3E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-20-130				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	7.2E-03	5.5E-01	2.4E-03	2.3E-01
Cobalt	4.1E-07	6.2E-05	1.4E-07	2.7E-05
Copper	5.0E-06	7.5E-04	1.7E-06	3.2E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.0E-05	3.1E-03	6.8E-06	1.3E-03
Nickel	2.8E-06	2.1E-03	9.3E-07	8.9E-04
Nitrate as nitrogen	4.8E-03	7.3E-01	1.6E-03	3.1E-01
Selenium	6.7E-06	1.0E-03	2.3E-06	4.3E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	4.3E-05	6.5E-03	1.4E-05	2.8E-03
Zinc	2.7E-05	6.9E-03	9.3E-06	3.0E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-21				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	1.1E-05	1.7E-03	3.8E-06	7.4E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.3E-05	1.9E-03	4.3E-06	8.3E-04
Nickel	4.1E-06	3.1E-03	1.4E-06	1.3E-03
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	1.0E-05	1.5E-03	3.4E-06	6.6E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	8.3E-05	2.1E-02	2.8E-05	8.9E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-22				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	8.8E-05	1.3E-02	3.0E-05	5.7E-03
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	1.4E-06	2.1E-04	4.8E-07	9.1E-05
Copper	3.3E-05	5.0E-03	1.1E-05	2.1E-03
Fluoride	ND	ND	ND	ND
Mercury	8.4E-08	1.3E-05	2.9E-08	5.5E-06
Molybdenum	1.4E-05	2.2E-03	4.9E-06	9.4E-04
Nickel	1.3E-05	9.6E-03	4.3E-06	4.1E-03
Nitrate as nitrogen	1.0E-03	1.5E-01	3.4E-04	6.5E-02
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	1.7E-05	2.5E-03	5.6E-06	1.1E-03
Zinc	5.0E-05	1.3E-02	1.7E-05	5.4E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-23				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	3.5E-04	5.3E-02	1.2E-04	2.3E-02
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	7.8E-06	1.2E-03	2.6E-06	5.1E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	6.9E-06	5.3E-03	2.4E-06	2.3E-03
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	3.0E-06	4.6E-04	1.0E-06	2.0E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	6.7E-05	1.7E-02	2.3E-05	7.3E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-24A				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	5.5E-06	8.4E-04	1.9E-06	3.6E-04
Barium	9.6E-05	1.5E-02	3.3E-05	6.2E-03
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.8E-03	2.1E-01	9.6E-04	9.2E-02
Cobalt	ND	ND	ND	ND
Copper	5.9E-06	9.0E-04	2.0E-06	3.9E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	9.8E-06	1.5E-03	3.3E-06	6.4E-04
Nickel	5.6E-07	4.2E-04	1.9E-07	1.8E-04
Nitrate as nitrogen	4.7E-03	7.2E-01	1.6E-03	3.1E-01
Selenium	8.2E-06	1.2E-03	2.8E-06	5.3E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.4E-05	1.4E-02	1.8E-05	5.8E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-24B				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	4.2E-03	3.1E-01	1.4E-03	1.3E-01
Cobalt	ND	ND	ND	ND
Copper	2.7E-06	4.1E-04	9.3E-07	1.8E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.5E-05	3.9E-03	8.6E-06	1.7E-03
Nickel	1.0E-06	7.9E-04	3.5E-07	3.4E-04
Nitrate as nitrogen	5.9E-03	8.9E-01	2.0E-03	3.8E-01
Selenium	6.0E-06	9.1E-04	2.0E-06	3.9E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.9E-05	1.5E-02	2.0E-05	6.4E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-24BR				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	9.9E-05	1.5E-02	3.4E-05	6.4E-03
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.1E-05	8.2E-04	3.7E-06	3.5E-04
Cobalt	NS	NS	NS	NS
Copper	6.5E-06	9.8E-04	2.2E-06	4.2E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	2.0E-05	3.0E-03	6.7E-06	1.3E-03
Nickel	6.4E-07	4.8E-04	2.2E-07	2.1E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	2.0E-05	5.0E-03	6.8E-06	2.2E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-25				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.0E-03	1.5E-01	6.8E-04	6.5E-02
Cobalt	ND	ND	ND	ND
Copper	3.2E-06	4.9E-04	1.1E-06	2.1E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	4.9E-07	3.7E-04	1.7E-07	1.6E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	2.4E-06	3.6E-04	8.1E-07	1.6E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	4.2E-05	1.1E-02	1.4E-05	4.5E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-26				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.1E-03	2.4E-01	1.1E-03	1.0E-01
Cobalt	ND	ND	ND	ND
Copper	4.0E-06	6.0E-04	1.3E-06	2.6E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.4E-05	2.1E-03	4.7E-06	9.0E-04
Nickel	8.4E-07	6.4E-04	2.8E-07	2.7E-04
Nitrate as nitrogen	2.3E-03	3.4E-01	7.7E-04	1.5E-01
Selenium	6.5E-06	9.8E-04	2.2E-06	4.2E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.3E-05	1.3E-02	1.8E-05	5.8E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-27-20				
Aluminum	ND	ND	ND	ND
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	7.2E-05	1.1E-02	2.4E-05	4.7E-03
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	8.0E-06	1.2E-03	2.7E-06	5.2E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	3.9E-06	3.0E-03	1.3E-06	1.3E-03
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	4.5E-05	1.1E-02	1.5E-05	4.9E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-28-25				
Aluminum	ND	ND	ND	ND
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	8.0E-05	1.2E-02	2.7E-05	5.2E-03
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	3.7E-06	5.6E-04	1.3E-06	2.4E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	7.5E-07	5.7E-04	2.6E-07	2.4E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	3.9E-05	9.8E-03	1.3E-05	4.2E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-29				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	6.7E-05	1.0E-02	2.3E-05	4.3E-03
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	4.1E-06	6.2E-04	1.4E-06	2.7E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	8.6E-07	6.5E-04	2.9E-07	2.8E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	4.3E-05	1.1E-02	1.4E-05	4.6E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-30-30				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	1.6E-04	2.4E-02	5.4E-05	1.0E-02
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	1.5E-05	2.2E-03	5.0E-06	9.5E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.3E-05	2.0E-03	4.4E-06	8.5E-04
Nickel	2.2E-05	1.7E-02	7.5E-06	7.2E-03
Nitrate as nitrogen	4.0E-03	6.1E-01	1.4E-03	2.6E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	2.3E-05	3.5E-03	7.7E-06	1.5E-03
Zinc	4.5E-05	1.1E-02	1.5E-05	4.9E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-30-50				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.1E-03	8.5E-02	3.8E-04	3.6E-02
Cobalt	NS	NS	NS	NS
Copper	4.6E-06	6.9E-04	1.5E-06	3.0E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	3.3E-05	8.3E-03	1.1E-05	3.6E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-31-60				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.3E-03	2.5E-01	1.1E-03	1.1E-01
Cobalt	ND	ND	ND	ND
Copper	6.2E-06	9.5E-04	2.1E-06	4.1E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	3.7E-06	2.8E-03	1.3E-06	1.2E-03
Nitrate as nitrogen	2.1E-03	3.2E-01	7.2E-04	1.4E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	1.6E-05	2.4E-03	5.3E-06	1.0E-03
Zinc	3.8E-05	9.7E-03	1.3E-05	4.1E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-31-135				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.4E-04	1.8E-02	8.1E-05	7.8E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-32-20				
Aluminum	ND	ND	ND	ND
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	2.2E-03	3.3E-01	7.4E-04	1.4E-01
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	1.6E-05	4.0E-03	5.4E-06	1.7E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-32-35				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	NS	NS	NS	NS
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	8.0E-05	2.0E-02	2.7E-05	8.7E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-33-40				
Aluminum	ND	ND	ND	ND
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	3.1E-06	4.7E-04	1.1E-06	2.0E-04
Fluoride	3.6E-03	5.5E-01	1.2E-03	2.3E-01
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	1.6E-05	4.0E-03	5.3E-06	1.7E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-33-90				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	2.3E-05	3.5E-03	7.8E-06	1.5E-03
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.6E-05	2.4E-03	5.3E-06	1.0E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	2.9E-05	7.4E-03	9.9E-06	3.2E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-33-210				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	5.3E-07	8.1E-05	1.8E-07	3.5E-05
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-34-55				
Aluminum	ND	ND	ND	ND
Antimony	1.8E-06	2.8E-04	6.2E-07	1.2E-04
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	1.8E-06	2.8E-04	6.2E-07	1.2E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	8.9E-07	6.8E-04	3.0E-07	2.9E-04
Nitrate as nitrogen	NS	NS	NS	NS
Selenium	1.5E-06	2.3E-04	5.1E-07	9.8E-05
Silver	1.4E-06	3.5E-04	4.7E-07	1.5E-04
Thallium	ND	ND	ND	ND
Vanadium	1.2E-04	1.8E-02	4.1E-05	7.9E-03
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-34-80				
Aluminum	2.9E-05	4.4E-03	9.8E-06	1.9E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	5.5E-07	8.3E-05	1.9E-07	3.6E-05
Copper	1.6E-06	2.4E-04	5.3E-07	1.0E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	6.9E-07	5.2E-04	2.3E-07	2.2E-04
Nitrate as nitrogen	NS	NS	NS	NS
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-34-100				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	6.0E-04	4.6E-02	2.0E-04	2.0E-02
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.5E-05	2.3E-03	5.2E-06	1.0E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-35-60				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.1E-05	2.4E-03	1.1E-05	1.0E-03
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-35-135				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.2E-05	1.7E-03	7.5E-06	7.2E-04
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-36-90				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.1E-03	1.6E-01	7.3E-04	7.0E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-36-100				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.3E-03	9.9E-02	4.4E-04	4.2E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-37D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	1.3E-03	1.0E-01	4.5E-04	4.3E-02
Cobalt	4.5E-07	6.8E-05	1.5E-07	2.9E-05
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.0E-05	3.0E-03	6.8E-06	1.3E-03
Nickel	4.7E-07	3.5E-04	1.6E-07	1.5E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-38S				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	7.5E-04	5.7E-02	2.5E-04	2.4E-02
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.7E-05	4.1E-03	9.1E-06	1.7E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	4.1E-03	6.3E-01	1.4E-03	2.7E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-38D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.8E-04	1.4E-02	6.3E-05	6.0E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	3.4E-05	5.1E-03	1.1E-05	2.2E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	1.9E-03	2.8E-01	6.3E-04	1.2E-01
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-39-50				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.4E-03	1.1E-01	4.8E-04	4.6E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	9.9E-04	1.5E-01	3.4E-04	6.4E-02
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-39-60				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.5E-03	1.9E-01	8.4E-04	8.0E-02
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	7.7E-04	1.2E-01	2.6E-04	5.0E-02
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-39-70				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	3.6E-03	2.7E-01	1.2E-03	1.2E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.1E-03	1.6E-01	3.6E-04	6.8E-02
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-39-80				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	3.7E-03	2.8E-01	1.3E-03	1.2E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.9E-03	2.9E-01	6.6E-04	1.3E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-39-100				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	6.6E-03	5.0E-01	2.3E-03	2.2E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.8E-03	2.7E-01	6.1E-04	1.2E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-40S				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.5E-03	3.7E-01	8.4E-04	1.6E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-40D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	7.0E-05	5.3E-03	2.4E-05	2.3E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	1.9E-05	2.9E-03	6.6E-06	1.3E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	3.2E-03	4.9E-01	1.1E-03	2.1E-01
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-43-25				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	9.3E-06	1.4E-03	3.2E-06	6.1E-04
Barium	ND	ND	ND	ND
Beryllium	3.0E-07	4.5E-05	1.0E-07	1.9E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	NS	NS	NS	NS
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-44-115				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	1.1E-03	8.6E-02	3.8E-04	3.7E-02
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS
Mercury	ND	ND	ND	ND
Molybdenum	3.4E-05	5.1E-03	1.2E-05	2.2E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-44-125				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	3.2E-04	2.4E-02	1.1E-04	1.0E-02
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	5.3E-05	8.0E-03	1.8E-05	3.4E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	1.7E-03	2.6E-01	5.8E-04	1.1E-01
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-45-095a				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.8E-04	1.3E-02	5.9E-05	5.7E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-46-175				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.5E-04	1.1E-02	5.0E-05	4.8E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	8.3E-05	1.3E-02	2.8E-05	5.4E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-47-55				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	4.6E-05	3.5E-03	1.6E-05	1.5E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-50-095				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.3E-04	1.7E-02	7.8E-05	7.5E-03
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-50-200				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	9.2E-03	7.0E-01	3.1E-03	3.0E-01
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS
Mercury	ND	ND	ND	ND
Molybdenum	1.9E-05	3.0E-03	6.6E-06	1.3E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.6E-03	3.9E-01	8.7E-04	1.7E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-51				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.8E-03	2.9E-01	1.3E-03	1.2E-01
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS
Mercury	ND	ND	ND	ND
Molybdenum	1.6E-05	2.4E-03	5.3E-06	1.0E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	5.9E-03	9.0E-01	2.0E-03	3.9E-01
Selenium	6.5E-06	9.8E-04	2.2E-06	4.2E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-1S				
Aluminum	1.4E-05	2.1E-03	4.7E-06	9.0E-04
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-1M				
Aluminum	1.3E-05	2.0E-03	4.5E-06	8.7E-04
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	4.3E-07	6.6E-05	1.5E-07	2.8E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	2.0E-06	3.0E-04	6.6E-07	1.3E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-1D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	4.5E-07	6.8E-05	1.5E-07	2.9E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	2.2E-06	3.4E-04	7.6E-07	1.5E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.4E-05	2.1E-03	4.6E-06	8.9E-04
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	3.2E-05	4.8E-03	1.1E-05	2.1E-03
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-2S				
Aluminum	1.7E-05	2.6E-03	5.9E-06	1.1E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	5.5E-07	8.3E-05	1.9E-07	3.6E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.4E-05	2.5E-03	1.1E-05	1.1E-03
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.0E-05	3.0E-03	6.8E-06	1.3E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.1E-03	3.2E-01	7.1E-04	1.4E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-2M				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	5.5E-07	8.4E-05	1.9E-07	3.6E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	2.0E-06	3.1E-04	6.8E-07	1.3E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	1.5E-03	2.2E-01	5.0E-04	9.6E-02
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-2D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	5.7E-07	8.6E-05	1.9E-07	3.7E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	2.1E-06	3.2E-04	7.1E-07	1.4E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.7E-05	2.6E-03	5.9E-06	1.1E-03
Nickel	5.9E-07	4.4E-04	2.0E-07	1.9E-04
Nitrate as nitrogen	2.0E-03	3.1E-01	6.9E-04	1.3E-01
Selenium	ND	ND	ND	ND
Silver	5.8E-07	1.5E-04	2.0E-07	6.3E-05
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-3D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.6E-05	2.4E-03	5.3E-06	1.0E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-5S				
Aluminum	1.3E-05	2.0E-03	4.5E-06	8.6E-04
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.3E-05	1.7E-03	7.6E-06	7.3E-04
Cobalt	7.8E-07	1.2E-04	2.6E-07	5.1E-05
Copper	1.9E-06	2.9E-04	6.4E-07	1.2E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	1.9E-03	2.9E-01	6.4E-04	1.2E-01
Selenium	ND	ND	ND	ND
Silver	1.6E-06	4.0E-04	5.4E-07	1.7E-04
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-5M				
Aluminum	3.4E-05	5.2E-03	1.2E-05	2.2E-03
Antimony	9.7E-07	1.5E-04	3.3E-07	6.3E-05
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	7.6E-07	1.2E-04	2.6E-07	4.9E-05
Cadmium	7.3E-07	1.1E-04	2.5E-07	4.7E-05
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	1.0E-06	1.6E-04	3.5E-07	6.7E-05
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.3E-05	2.0E-03	4.5E-06	8.7E-04
Nickel	6.3E-07	4.8E-04	2.1E-07	2.0E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	1.7E-06	2.6E-04	5.7E-07	1.1E-04
Silver	8.0E-07	2.0E-04	2.7E-07	8.6E-05
Thallium	ND	ND	ND	ND
Vanadium	2.6E-05	3.9E-03	8.7E-06	1.7E-03
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-5D				
Aluminum	2.8E-05	4.2E-03	9.5E-06	1.8E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	4.4E-07	6.6E-05	1.5E-07	2.8E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	2.0E-06	3.1E-04	6.9E-07	1.3E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.0E-05	3.0E-03	6.8E-06	1.3E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	3.0E-05	4.6E-03	1.0E-05	2.0E-03
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PE-1				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	8.4E-05	6.4E-03	2.9E-05	2.7E-03
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PGE-6				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.0E-03	7.6E-02	3.4E-04	3.2E-02
Cobalt	NS	NS	NS	NS
Copper	6.1E-06	9.2E-04	2.1E-06	3.9E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	5.3E-07	4.0E-04	1.8E-07	1.7E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	1.7E-04	4.3E-02	5.8E-05	1.8E-02

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PGE-7				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	4.7E-03	3.6E-01	1.6E-03	1.5E-01
Cobalt	NS	NS	NS	NS
Copper	7.9E-06	1.2E-03	2.7E-06	5.2E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	2.3E-05	3.5E-03	7.9E-06	1.5E-03
Nickel	6.5E-07	4.9E-04	2.2E-07	2.1E-04
Nitrate as nitrogen	3.3E-03	5.0E-01	1.1E-03	2.1E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	1.3E-05	3.3E-03	4.5E-06	1.4E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PGE-8				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	2.9E-05	4.4E-03	9.9E-06	1.9E-03
Nickel	1.1E-06	8.5E-04	3.8E-07	3.6E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	7.8E-05	2.0E-02	2.7E-05	8.5E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
Park Moabi-4				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	6.1E-03	9.2E-01	2.1E-03	3.9E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	1.5E-04	3.9E-02	5.2E-05	1.7E-02

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-1D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.3E-03	1.8E-01	8.0E-04	7.6E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-2D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.7E-03	1.3E-01	5.7E-04	5.5E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-3D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	3.7E-03	2.8E-01	1.3E-03	1.2E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-4D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	5.0E-03	3.8E-01	1.7E-03	1.6E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-5D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.6E-03	2.0E-01	8.8E-04	8.4E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-6D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.4E-03	1.8E-01	8.0E-04	7.6E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-7S				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.0E-03	7.7E-02	3.4E-04	3.3E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	9.3E-03	1.4E+00	3.1E-03	6.0E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-7M				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.0E-03	1.5E-01	6.6E-04	6.4E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.1E-02	1.6E+00	3.6E-03	6.9E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-7D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	6.1E-03	4.6E-01	2.1E-03	2.0E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	3.1E-03	4.7E-01	1.1E-03	2.0E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-8S				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.5E-03	1.1E-01	5.0E-04	4.8E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.1E-02	1.6E+00	3.6E-03	6.9E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-8M				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	3.3E-03	2.5E-01	1.1E-03	1.1E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.3E-02	2.0E+00	4.5E-03	8.7E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-8D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	5.5E-03	4.2E-01	1.9E-03	1.8E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	4.1E-03	6.2E-01	1.4E-03	2.7E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-9S				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.0E-03	7.5E-02	3.4E-04	3.2E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	6.9E-03	1.0E+00	2.3E-03	4.5E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-9M				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.0E-03	1.5E-01	6.7E-04	6.4E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.0E-02	1.6E+00	3.5E-03	6.7E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-9D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.3E-02	1.0E+00	4.5E-03	4.3E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	3.9E-03	5.9E-01	1.3E-03	2.5E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PTI-1D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.8E-03	2.1E-01	9.6E-04	9.2E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PTR-1				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	4.5E-04	3.4E-02	1.5E-04	1.5E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	7.8E-03	1.2E+00	2.6E-03	5.0E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PTR-2				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.7E-03	2.0E-01	9.1E-04	8.7E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.1E-02	1.6E+00	3.7E-03	7.1E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
TW-1				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.5E-03	2.6E-01	1.2E-03	1.1E-01
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.3E-03	3.5E-01	7.8E-04	1.5E-01
Selenium	4.5E-05	6.8E-03	1.5E-05	2.9E-03
Silver	6.6E-06	1.7E-03	2.2E-06	7.2E-04
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	2.0E-05	5.1E-03	6.9E-06	2.2E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
TW-2S				
Aluminum	2.7E-05	4.1E-03	9.1E-06	1.7E-03
Antimony	2.2E-05	3.3E-03	7.5E-06	1.4E-03
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	4.1E-03	3.1E-01	1.4E-03	1.3E-01
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.5E-03	3.8E-01	8.6E-04	1.6E-01
Selenium	3.6E-06	5.4E-04	1.2E-06	2.3E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	2.3E-05	5.8E-03	7.8E-06	2.5E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
TW-2D				
Aluminum	ND	ND	ND	ND
Antimony	2.2E-05	3.4E-03	7.6E-06	1.4E-03
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	4.6E-03	3.5E-01	1.6E-03	1.5E-01
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.8E-05	2.7E-03	6.1E-06	1.2E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
TW-3D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.4E-03	1.8E-01	8.1E-04	7.8E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
TW-4				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.7E-05	1.3E-03	5.8E-06	5.6E-04
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-1M				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	9.2E-06	1.4E-03	3.1E-06	6.0E-04
Zinc	1.2E-05	3.1E-03	4.2E-06	1.3E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-1D				
Aluminum	1.6E-05	2.4E-03	5.3E-06	1.0E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	4.8E-07	7.3E-05	1.6E-07	3.1E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.7E-05	2.6E-03	5.8E-06	1.1E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	9.7E-06	1.5E-03	3.3E-06	6.3E-04
Zinc	9.7E-06	2.4E-03	3.3E-06	1.0E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-2M				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	1.1E-05	1.7E-03	3.7E-06	7.1E-04
Zinc	9.8E-06	2.5E-03	3.3E-06	1.1E-03

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-2D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	4.8E-07	7.3E-05	1.6E-07	3.1E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	1.8E-03	2.8E-01	6.2E-04	1.2E-01
Mercury	ND	ND	ND	ND
Molybdenum	2.6E-05	3.9E-03	8.8E-06	1.7E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	1.2E-05	1.9E-03	4.2E-06	8.0E-04
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-3M				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	4.2E-07	6.3E-05	1.4E-07	2.7E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.3E-05	1.9E-03	4.3E-06	8.2E-04
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	1.8E-03	2.7E-01	6.1E-04	1.2E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	9.2E-06	1.4E-03	3.1E-06	5.9E-04
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-3D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	4.8E-07	7.3E-05	1.6E-07	3.1E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.8E-05	4.2E-03	9.3E-06	1.8E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	1.1E-06	1.7E-04	3.8E-07	7.3E-05
Vanadium	1.1E-05	1.6E-03	3.6E-06	7.0E-04
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-4M				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	4.0E-07	6.1E-05	1.4E-07	2.6E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	2.4E-06	3.7E-04	8.3E-07	1.6E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	8.1E-06	1.2E-03	2.7E-06	5.3E-04
Zinc	ND	ND	ND	ND

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-4D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	4.3E-07	6.5E-05	1.4E-07	2.8E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	1.9E-06	2.9E-04	6.5E-07	1.2E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.8E-05	2.7E-03	6.0E-06	1.2E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	9.1E-06	1.4E-03	3.1E-06	5.9E-04
Zinc	ND	ND	ND	ND

Notes:

Table G-3. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects: Sensitivity Analysis

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Constituent of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion

CDI = chronic daily intake

mg/kg/d = milligrams per kilogram per day

ND = not detected or not detected above background concentrations

NS = not sampled

Table G-4. Estimated Potential Cancer Risks – Hypothetical Future Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Cancer Risk								
	On-Site Resident Child			On-Site Resident Adult			On-Site Resident Age-Adjusted		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk
MW-12									
Aluminum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	3.6E-05	5.5E-03	5.5E-03	6.1E-05	1.2E-02	1.2E-02	8.5E-05	1.5E-02	1.5E-02
Barium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cumulative risk	3.6E-05	5.5E-03	5.5E-03	6.1E-05	1.2E-02	1.2E-02	8.5E-05	1.5E-02	1.5E-02

Table G-4. Estimated Potential Cancer Risks – Hypothetical Future Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Cancer Risk								
	On-Site Resident Child			On-Site Resident Adult			On-Site Resident Age-Adjusted		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk
MW-24A									
Aluminum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	4.5E-06	6.8E-04	6.8E-04	7.6E-06	1.5E-03	1.5E-03	1.1E-05	1.8E-03	1.9E-03
Barium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cumulative risk	4.5E-06	6.8E-04	6.8E-04	7.6E-06	1.5E-03	1.5E-03	1.1E-05	1.8E-03	1.9E-03

Table G-4. Estimated Potential Cancer Risks – Hypothetical Future Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Cancer Risk								
	On-Site Resident Child			On-Site Resident Adult			On-Site Resident Age-Adjusted		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk
MW-43-25									
Aluminum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	7.6E-06	1.1E-03	1.2E-03	1.3E-05	2.5E-03	2.5E-03	1.8E-05	3.1E-03	3.1E-03
Barium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cumulative risk	7.6E-06	1.1E-03	1.2E-03	1.3E-05	2.5E-03	2.5E-03	1.8E-05	3.1E-03	3.1E-03

Notes:

NA = not applicable

NC = noncarcinogenic compound

ND = not detected or not detected above background concentrations

NS = not sampled

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-1						
Aluminum	2.0E-05	3.0E-03	3.0E-03	6.7E-06	1.3E-03	1.3E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	1.5E-02	2.3E+00	2.3E+00	5.1E-03	9.7E-01	9.7E-01
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	9.3E-04	1.4E-01	1.4E-01	3.1E-04	6.0E-02	6.1E-02
Nickel	5.1E-05	3.8E-02	3.8E-02	1.7E-05	1.6E-02	1.6E-02
Nitrate as nitrogen	1.6E-03	2.5E-01	2.5E-01	5.6E-04	1.1E-01	1.1E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.8E-02	2.7E+00	2.7E+00	5.9E-03	1.2E+00	1.2E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-3						
Aluminum	1.9E-05	2.8E-03	2.9E-03	6.3E-06	1.2E-03	1.2E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.9E-03	4.4E-01	4.4E-01	9.8E-04	1.9E-01	1.9E-01
Nickel	1.3E-04	9.7E-02	9.7E-02	4.3E-05	4.1E-02	4.1E-02
Nitrate as nitrogen	2.6E-03	4.0E-01	4.0E-01	8.9E-04	1.7E-01	1.7E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	5.7E-03	9.4E-01	9.4E-01	1.9E-03	4.0E-01	4.0E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-4						
Aluminum	1.8E-05	2.8E-03	2.8E-03	6.2E-06	1.2E-03	1.2E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	6.8E-05	5.2E-02	5.2E-02	2.3E-05	2.2E-02	2.2E-02
Nitrate as nitrogen	1.6E-03	2.4E-01	2.4E-01	5.3E-04	1.0E-01	1.0E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.6E-03	2.9E-01	2.9E-01	5.6E-04	1.2E-01	1.2E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-5						
Aluminum	1.8E-05	2.7E-03	2.7E-03	6.0E-06	1.1E-03	1.2E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	7.7E-03	1.2E+00	1.2E+00	2.6E-03	5.0E-01	5.0E-01
Nickel	4.8E-05	3.6E-02	3.6E-02	1.6E-05	1.6E-02	1.6E-02
Nitrate as nitrogen	4.5E-03	6.8E-01	6.8E-01	1.5E-03	2.9E-01	2.9E-01
Selenium	1.6E-03	2.4E-01	2.4E-01	5.4E-04	1.0E-01	1.0E-01
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.4E-02	2.1E+00	2.1E+00	4.7E-03	9.1E-01	9.1E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-6						
Aluminum	1.8E-05	2.8E-03	2.8E-03	6.2E-06	1.2E-03	1.2E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	5.6E-02	8.4E+00	8.5E+00	1.9E-02	3.6E+00	3.6E+00
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	5.6E-02	8.4E+00	8.5E+00	1.9E-02	3.6E+00	3.6E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-7						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	4.9E-05	3.7E-02	3.7E-02	1.6E-05	1.6E-02	1.6E-02
Nitrate as nitrogen	2.0E-03	3.0E-01	3.0E-01	6.7E-04	1.3E-01	1.3E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.0E-03	3.3E-01	3.4E-01	6.8E-04	1.4E-01	1.4E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-8						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.2E-02	9.1E-01	9.2E-01	4.1E-03	3.9E-01	3.9E-01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	6.0E-05	9.1E-03	9.2E-03	2.0E-05	3.9E-03	3.9E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.9E-05	3.0E-02	3.0E-02	1.3E-05	1.3E-02	1.3E-02
Nitrate as nitrogen	4.7E-03	7.1E-01	7.2E-01	1.6E-03	3.0E-01	3.1E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.7E-02	1.7E+00	1.7E+00	5.7E-03	7.1E-01	7.2E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-9						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	9.8E-02	7.4E+00	7.5E+00	3.3E-02	3.2E+00	3.2E+00
Cobalt	ND	ND	ND	ND	ND	ND
Copper	7.7E-05	1.2E-02	1.2E-02	2.6E-05	5.0E-03	5.1E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.4E-05	2.6E-02	2.6E-02	1.1E-05	1.1E-02	1.1E-02
Nitrate as nitrogen	2.1E-03	3.2E-01	3.2E-01	7.1E-04	1.4E-01	1.4E-01
Selenium	8.2E-04	1.2E-01	1.2E-01	2.8E-04	5.3E-02	5.3E-02
Silver	3.0E-04	7.5E-02	7.6E-02	1.0E-04	3.2E-02	3.2E-02
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.7E-04	4.4E-02	4.4E-02	5.9E-05	1.9E-02	1.9E-02
Cumulative noncancer hazard index	1.0E-01	8.0E+00	8.1E+00	3.4E-02	3.4E+00	3.5E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-10						
Aluminum	3.1E-05	4.8E-03	4.8E-03	1.1E-05	2.0E-03	2.0E-03
Antimony	1.7E-03	2.5E-01	2.6E-01	5.7E-04	1.1E-01	1.1E-01
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	5.7E-01	4.3E+01	4.4E+01	1.9E-01	1.9E+01	1.9E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	5.2E-05	7.8E-03	7.9E-03	1.8E-05	3.4E-03	3.4E-03
Fluoride	1.1E-01	1.7E+01	1.7E+01	3.9E-02	7.4E+00	7.4E+00
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	1.4E-02	2.1E+00	2.1E+00	4.8E-03	9.2E-01	9.2E-01
Nickel	2.8E-05	2.1E-02	2.1E-02	9.5E-06	9.1E-03	9.1E-03
Nitrate as nitrogen	2.5E-03	3.9E-01	3.9E-01	8.6E-04	1.7E-01	1.7E-01
Selenium	6.3E-04	9.6E-02	9.7E-02	2.2E-04	4.1E-02	4.1E-02
Silver	2.7E-04	6.9E-02	6.9E-02	9.2E-05	2.9E-02	3.0E-02
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	3.6E-03	5.4E-01	5.4E-01	1.2E-03	2.3E-01	2.3E-01
Zinc	1.5E-04	3.9E-02	3.9E-02	5.2E-05	1.7E-02	1.7E-02
Cumulative noncancer hazard index	7.1E-01	6.4E+01	6.5E+01	2.4E-01	2.7E+01	2.8E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-11						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	1.9E-04	2.9E-02	3.0E-02	6.6E-05	1.3E-02	1.3E-02
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.4E-01	1.8E+01	1.9E+01	8.2E-02	7.9E+00	7.9E+00
Cobalt	ND	ND	ND	ND	ND	ND
Copper	5.1E-05	7.7E-03	7.8E-03	1.7E-05	3.3E-03	3.3E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	2.9E-05	2.2E-02	2.2E-02	9.9E-06	9.5E-03	9.5E-03
Nitrate as nitrogen	2.8E-03	4.2E-01	4.2E-01	9.3E-04	1.8E-01	1.8E-01
Selenium	6.9E-04	1.0E-01	1.0E-01	2.3E-04	4.5E-02	4.5E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.5E-04	3.8E-02	3.8E-02	5.1E-05	1.6E-02	1.6E-02
Cumulative noncancer hazard index	2.5E-01	1.9E+01	1.9E+01	8.3E-02	8.1E+00	8.2E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-12						
Aluminum	3.0E-05	4.5E-03	4.5E-03	1.0E-05	1.9E-03	1.9E-03
Antimony	3.4E-03	5.2E-01	5.2E-01	1.2E-03	2.2E-01	2.2E-01
Arsenic	1.5E-01	2.3E+01	2.3E+01	5.1E-02	9.7E+00	9.7E+00
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	3.8E-01	2.9E+01	2.9E+01	1.3E-01	1.2E+01	1.2E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	5.2E-05	7.9E-03	7.9E-03	1.8E-05	3.4E-03	3.4E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.6E-03	6.9E-01	7.0E-01	1.6E-03	3.0E-01	3.0E-01
Nickel	2.7E-05	2.0E-02	2.0E-02	9.0E-06	8.7E-03	8.7E-03
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	1.7E-02	2.5E+00	2.5E+00	5.7E-03	1.1E+00	1.1E+00
Vanadium	4.9E-03	7.5E-01	7.5E-01	1.7E-03	3.2E-01	3.2E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	5.6E-01	5.6E+01	5.6E+01	1.9E-01	2.4E+01	2.4E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-13						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	6.8E-05	1.0E-02	1.0E-02	2.3E-05	4.4E-03	4.5E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	1.1E-04	8.6E-02	8.6E-02	3.9E-05	3.7E-02	3.7E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.8E-04	4.6E-02	4.6E-02	6.2E-05	2.0E-02	2.0E-02
Cumulative noncancer hazard index	3.6E-04	1.4E-01	1.4E-01	1.2E-04	6.1E-02	6.1E-02

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-14						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.2E-02	9.3E-01	9.4E-01	4.2E-03	4.0E-01	4.0E-01
Cobalt	1.1E-03	1.6E-01	1.6E-01	3.6E-04	6.9E-02	6.9E-02
Copper	8.4E-05	1.3E-02	1.3E-02	2.9E-05	5.5E-03	5.5E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	5.7E-05	4.3E-02	4.3E-02	1.9E-05	1.8E-02	1.8E-02
Nitrate as nitrogen	1.9E-03	2.9E-01	2.9E-01	6.5E-04	1.2E-01	1.3E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.5E-04	3.8E-02	3.8E-02	5.1E-05	1.6E-02	1.6E-02
Cumulative noncancer hazard index	1.6E-02	1.5E+00	1.5E+00	5.3E-03	6.3E-01	6.4E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-15						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	4.6E-03	3.5E-01	3.5E-01	1.6E-03	1.5E-01	1.5E-01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	9.8E-05	1.5E-02	1.5E-02	3.3E-05	6.4E-03	6.4E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.3E-05	2.5E-02	2.5E-02	1.1E-05	1.1E-02	1.1E-02
Nitrate as nitrogen	1.0E-03	1.6E-01	1.6E-01	3.5E-04	6.8E-02	6.8E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.6E-04	4.0E-02	4.1E-02	5.4E-05	1.7E-02	1.7E-02
Cumulative noncancer hazard index	5.9E-03	5.9E-01	5.9E-01	2.0E-03	2.5E-01	2.5E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-19						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.5E-01	1.9E+01	1.9E+01	8.6E-02	8.2E+00	8.3E+00
Cobalt	ND	ND	ND	ND	ND	ND
Copper	6.9E-05	1.0E-02	1.1E-02	2.3E-05	4.5E-03	4.5E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.2E-05	2.4E-02	2.4E-02	1.1E-05	1.0E-02	1.0E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.8E-04	4.7E-02	4.7E-02	6.3E-05	2.0E-02	2.0E-02
Cumulative noncancer hazard index	2.5E-01	1.9E+01	2.0E+01	8.6E-02	8.3E+00	8.3E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-20-70						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	2.1E-03	3.2E-01	3.2E-01	7.1E-04	1.4E-01	1.4E-01
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.7E+00	2.1E+02	2.1E+02	9.2E-01	8.8E+01	8.9E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.1E-04	1.7E-02	1.7E-02	3.9E-05	7.4E-03	7.4E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	2.9E-05	2.2E-02	2.2E-02	1.0E-05	9.5E-03	9.6E-03
Nitrate as nitrogen	3.3E-03	4.9E-01	5.0E-01	1.1E-03	2.1E-01	2.1E-01
Selenium	1.0E-03	1.5E-01	1.5E-01	3.4E-04	6.5E-02	6.5E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	3.5E-03	5.3E-01	5.3E-01	1.2E-03	2.3E-01	2.3E-01
Zinc	1.7E-04	4.2E-02	4.2E-02	5.6E-05	1.8E-02	1.8E-02
Cumulative noncancer hazard index	2.7E+00	2.1E+02	2.1E+02	9.2E-01	8.9E+01	9.0E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-20-100						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	4.5E-02	6.9E+00	6.9E+00	1.5E-02	2.9E+00	3.0E+00
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.1E+00	1.6E+02	1.6E+02	7.1E-01	6.8E+01	6.8E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.2E-04	1.8E-02	1.9E-02	4.1E-05	7.9E-03	7.9E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	9.6E-05	7.3E-02	7.3E-02	3.3E-05	3.1E-02	3.1E-02
Nitrate as nitrogen	3.7E-03	5.6E-01	5.7E-01	1.3E-03	2.4E-01	2.4E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.6E-04	4.1E-02	4.1E-02	5.5E-05	1.8E-02	1.8E-02
Cumulative noncancer hazard index	2.1E+00	1.7E+02	1.7E+02	7.2E-01	7.1E+01	7.2E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-20-130						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.4E+00	1.8E+02	1.8E+02	8.1E-01	7.8E+01	7.9E+01
Cobalt	1.4E-03	2.1E-01	2.1E-01	4.6E-04	8.9E-02	8.9E-02
Copper	1.2E-04	1.9E-02	1.9E-02	4.2E-05	8.1E-03	8.1E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.0E-03	6.1E-01	6.2E-01	1.4E-03	2.6E-01	2.6E-01
Nickel	1.4E-04	1.0E-01	1.0E-01	4.7E-05	4.5E-02	4.5E-02
Nitrate as nitrogen	3.0E-03	4.5E-01	4.6E-01	1.0E-03	1.9E-01	2.0E-01
Selenium	1.3E-03	2.0E-01	2.0E-01	4.5E-04	8.7E-02	8.7E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	6.1E-03	9.2E-01	9.3E-01	2.1E-03	4.0E-01	4.0E-01
Zinc	9.1E-05	2.3E-02	2.3E-02	3.1E-05	9.9E-03	9.9E-03
Cumulative noncancer hazard index	2.4E+00	1.8E+02	1.9E+02	8.2E-01	7.9E+01	8.0E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-21						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	2.8E-04	4.3E-02	4.3E-02	9.6E-05	1.8E-02	1.9E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.6E-03	3.9E-01	3.9E-01	8.7E-04	1.7E-01	1.7E-01
Nickel	2.1E-04	1.6E-01	1.6E-01	7.0E-05	6.7E-02	6.7E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	2.0E-03	3.1E-01	3.1E-01	6.9E-04	1.3E-01	1.3E-01
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	2.8E-04	6.9E-02	7.0E-02	9.3E-05	3.0E-02	3.0E-02
Cumulative noncancer hazard index	5.4E-03	9.6E-01	9.7E-01	1.8E-03	4.1E-01	4.2E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-22						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	4.4E-04	6.7E-02	6.7E-02	1.5E-04	2.9E-02	2.9E-02
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	4.7E-03	7.1E-01	7.1E-01	1.6E-03	3.0E-01	3.1E-01
Copper	8.2E-04	1.2E-01	1.3E-01	2.8E-04	5.3E-02	5.4E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	2.8E-04	4.3E-02	4.3E-02	9.5E-05	1.8E-02	1.8E-02
Molybdenum	2.9E-03	4.4E-01	4.4E-01	9.8E-04	1.9E-01	1.9E-01
Nickel	6.3E-04	4.8E-01	4.8E-01	2.1E-04	2.1E-01	2.1E-01
Nitrate as nitrogen	6.2E-04	9.4E-02	9.5E-02	2.1E-04	4.0E-02	4.1E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	2.4E-03	3.6E-01	3.6E-01	8.0E-04	1.5E-01	1.5E-01
Zinc	1.7E-04	4.2E-02	4.2E-02	5.6E-05	1.8E-02	1.8E-02
Cumulative noncancer hazard index	1.3E-02	2.4E+00	2.4E+00	4.4E-03	1.0E+00	1.0E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-23						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	1.7E-03	2.6E-01	2.7E-01	5.9E-04	1.1E-01	1.1E-01
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	2.0E-04	3.0E-02	3.0E-02	6.6E-05	1.3E-02	1.3E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.5E-04	2.6E-01	2.6E-01	1.2E-04	1.1E-01	1.1E-01
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	6.0E-04	9.1E-02	9.2E-02	2.0E-04	3.9E-02	3.9E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	2.2E-04	5.6E-02	5.7E-02	7.6E-05	2.4E-02	2.4E-02
Cumulative noncancer hazard index	3.1E-03	7.0E-01	7.1E-01	1.1E-03	3.0E-01	3.0E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-24A						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	1.8E-02	2.8E+00	2.8E+00	6.2E-03	1.2E+00	1.2E+00
Barium	4.8E-04	7.3E-02	7.3E-02	1.6E-04	3.1E-02	3.1E-02
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	9.5E-01	7.2E+01	7.3E+01	3.2E-01	3.1E+01	3.1E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.5E-04	2.3E-02	2.3E-02	5.0E-05	9.7E-03	9.7E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.0E-03	3.0E-01	3.0E-01	6.7E-04	1.3E-01	1.3E-01
Nickel	2.8E-05	2.1E-02	2.1E-02	9.4E-06	9.0E-03	9.0E-03
Nitrate as nitrogen	3.0E-03	4.5E-01	4.5E-01	1.0E-03	1.9E-01	1.9E-01
Selenium	1.6E-03	2.5E-01	2.5E-01	5.6E-04	1.1E-01	1.1E-01
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.8E-04	4.5E-02	4.5E-02	6.1E-05	1.9E-02	1.9E-02
Cumulative noncancer hazard index	9.7E-01	7.6E+01	7.7E+01	3.3E-01	3.2E+01	3.3E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-24B						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.4E+00	1.0E+02	1.1E+02	4.7E-01	4.5E+01	4.5E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	6.8E-05	1.0E-02	1.0E-02	2.3E-05	4.4E-03	4.5E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	5.1E-03	7.7E-01	7.8E-01	1.7E-03	3.3E-01	3.3E-01
Nickel	5.2E-05	4.0E-02	4.0E-02	1.8E-05	1.7E-02	1.7E-02
Nitrate as nitrogen	3.7E-03	5.6E-01	5.6E-01	1.3E-03	2.4E-01	2.4E-01
Selenium	1.2E-03	1.8E-01	1.8E-01	4.1E-04	7.8E-02	7.9E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	2.0E-04	4.9E-02	5.0E-02	6.6E-05	2.1E-02	2.1E-02
Cumulative noncancer hazard index	1.4E+00	1.1E+02	1.1E+02	4.7E-01	4.6E+01	4.6E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-24BR						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	5.0E-04	7.5E-02	7.6E-02	1.7E-04	3.2E-02	3.2E-02
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	3.6E-03	2.7E-01	2.8E-01	1.2E-03	1.2E-01	1.2E-01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	1.6E-04	2.4E-02	2.5E-02	5.5E-05	1.0E-02	1.1E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	4.0E-03	6.0E-01	6.0E-01	1.3E-03	2.6E-01	2.6E-01
Nickel	3.2E-05	2.4E-02	2.4E-02	1.1E-05	1.0E-02	1.0E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	6.6E-05	1.7E-02	1.7E-02	2.3E-05	7.2E-03	7.2E-03
Cumulative noncancer hazard index	8.4E-03	1.0E+00	1.0E+00	2.8E-03	4.4E-01	4.4E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-25						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	6.6E-01	5.0E+01	5.1E+01	2.3E-01	2.2E+01	2.2E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	8.0E-05	1.2E-02	1.2E-02	2.7E-05	5.2E-03	5.2E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	2.4E-05	1.8E-02	1.8E-02	8.3E-06	7.9E-03	7.9E-03
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	4.8E-04	7.3E-02	7.3E-02	1.6E-04	3.1E-02	3.1E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.4E-04	3.5E-02	3.6E-02	4.7E-05	1.5E-02	1.5E-02
Cumulative noncancer hazard index	6.7E-01	5.0E+01	5.1E+01	2.3E-01	2.2E+01	2.2E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-26						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.0E+00	7.9E+01	8.1E+01	3.6E-01	3.4E+01	3.4E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	9.9E-05	1.5E-02	1.5E-02	3.4E-05	6.4E-03	6.5E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.8E-03	4.2E-01	4.2E-01	9.4E-04	1.8E-01	1.8E-01
Nickel	4.2E-05	3.2E-02	3.2E-02	1.4E-05	1.4E-02	1.4E-02
Nitrate as nitrogen	1.4E-03	2.1E-01	2.2E-01	4.8E-04	9.2E-02	9.2E-02
Selenium	1.3E-03	2.0E-01	2.0E-01	4.4E-04	8.4E-02	8.4E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.8E-04	4.5E-02	4.5E-02	6.0E-05	1.9E-02	1.9E-02
Cumulative noncancer hazard index	1.1E+00	8.0E+01	8.1E+01	3.6E-01	3.4E+01	3.5E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-27-20						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	3.6E-04	5.4E-02	5.5E-02	1.2E-04	2.3E-02	2.3E-02
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	2.0E-04	3.0E-02	3.0E-02	6.8E-05	1.3E-02	1.3E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	2.0E-04	1.5E-01	1.5E-01	6.7E-05	6.4E-02	6.4E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.5E-04	3.8E-02	3.8E-02	5.1E-05	1.6E-02	1.6E-02
Cumulative noncancer hazard index	9.1E-04	2.7E-01	2.7E-01	3.1E-04	1.2E-01	1.2E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-28-25						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	4.0E-04	6.1E-02	6.1E-02	1.4E-04	2.6E-02	2.6E-02
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	9.2E-05	1.4E-02	1.4E-02	3.1E-05	6.0E-03	6.0E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.8E-05	2.9E-02	2.9E-02	1.3E-05	1.2E-02	1.2E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.3E-04	3.3E-02	3.3E-02	4.4E-05	1.4E-02	1.4E-02
Cumulative noncancer hazard index	6.6E-04	1.4E-01	1.4E-01	2.2E-04	5.8E-02	5.8E-02

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-29						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	3.3E-04	5.1E-02	5.1E-02	1.1E-04	2.2E-02	2.2E-02
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	1.0E-04	1.6E-02	1.6E-02	3.5E-05	6.7E-03	6.7E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	4.3E-05	3.3E-02	3.3E-02	1.5E-05	1.4E-02	1.4E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.4E-04	3.6E-02	3.6E-02	4.8E-05	1.5E-02	1.5E-02
Cumulative noncancer hazard index	6.2E-04	1.3E-01	1.4E-01	2.1E-04	5.8E-02	5.8E-02

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-30-30						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	8.0E-04	1.2E-01	1.2E-01	2.7E-04	5.2E-02	5.2E-02
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	3.7E-04	5.5E-02	5.6E-02	1.2E-04	2.4E-02	2.4E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.6E-03	4.0E-01	4.0E-01	8.8E-04	1.7E-01	1.7E-01
Nickel	1.1E-03	8.3E-01	8.4E-01	3.7E-04	3.6E-01	3.6E-01
Nitrate as nitrogen	2.5E-03	3.8E-01	3.8E-01	8.5E-04	1.6E-01	1.6E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	3.3E-03	4.9E-01	5.0E-01	1.1E-03	2.1E-01	2.1E-01
Zinc	1.5E-04	3.8E-02	3.8E-02	5.1E-05	1.6E-02	1.6E-02
Cumulative noncancer hazard index	1.1E-02	2.3E+00	2.3E+00	3.7E-03	9.9E-01	1.0E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-30-50						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	3.7E-01	2.8E+01	2.9E+01	1.3E-01	1.2E+01	1.2E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	1.1E-04	1.7E-02	1.7E-02	3.9E-05	7.4E-03	7.4E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	1.1E-04	2.8E-02	2.8E-02	3.7E-05	1.2E-02	1.2E-02
Cumulative noncancer hazard index	3.7E-01	2.8E+01	2.9E+01	1.3E-01	1.2E+01	1.2E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-31-60						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.1E+00	8.3E+01	8.4E+01	3.7E-01	3.5E+01	3.6E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.6E-04	2.4E-02	2.4E-02	5.3E-05	1.0E-02	1.0E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	1.9E-04	1.4E-01	1.4E-01	6.3E-05	6.0E-02	6.0E-02
Nitrate as nitrogen	1.3E-03	2.0E-01	2.0E-01	4.5E-04	8.6E-02	8.6E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	2.2E-03	3.4E-01	3.4E-01	7.6E-04	1.5E-01	1.5E-01
Zinc	1.3E-04	3.2E-02	3.2E-02	4.3E-05	1.4E-02	1.4E-02
Cumulative noncancer hazard index	1.1E+00	8.3E+01	8.4E+01	3.7E-01	3.6E+01	3.6E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-31-135						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	8.0E-02	6.1E+00	6.1E+00	2.7E-02	2.6E+00	2.6E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	8.0E-02	6.1E+00	6.1E+00	2.7E-02	2.6E+00	2.6E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-32-20						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	1.1E-02	1.6E+00	1.7E+00	3.7E-03	7.0E-01	7.1E-01
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	5.3E-05	1.3E-02	1.3E-02	1.8E-05	5.8E-03	5.8E-03
Cumulative noncancer hazard index	1.1E-02	1.7E+00	1.7E+00	3.7E-03	7.1E-01	7.1E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-32-35						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	NS	NS	NS	NS	NS	NS
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	2.7E-04	6.7E-02	6.8E-02	9.0E-05	2.9E-02	2.9E-02
Cumulative noncancer hazard index	2.7E-04	6.7E-02	6.8E-02	9.0E-05	2.9E-02	2.9E-02

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-33-40						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	7.8E-05	1.2E-02	1.2E-02	2.7E-05	5.1E-03	5.1E-03
Fluoride	6.0E-02	9.1E+00	9.1E+00	2.0E-02	3.9E+00	3.9E+00
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	5.2E-05	1.3E-02	1.3E-02	1.8E-05	5.7E-03	5.7E-03
Cumulative noncancer hazard index	6.0E-02	9.1E+00	9.2E+00	2.0E-02	3.9E+00	3.9E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-33-90						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	5.8E-04	8.7E-02	8.8E-02	2.0E-04	3.7E-02	3.8E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.1E-03	4.7E-01	4.7E-01	1.1E-03	2.0E-01	2.0E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	9.7E-05	2.5E-02	2.5E-02	3.3E-05	1.1E-02	1.1E-02
Cumulative noncancer hazard index	3.8E-03	5.8E-01	5.9E-01	1.3E-03	2.5E-01	2.5E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-33-210						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	1.8E-03	2.7E-01	2.7E-01	6.0E-04	1.2E-01	1.2E-01
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.8E-03	2.7E-01	2.7E-01	6.0E-04	1.2E-01	1.2E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-34-55						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	4.6E-03	6.9E-01	7.0E-01	1.5E-03	3.0E-01	3.0E-01
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	4.6E-05	6.9E-03	7.0E-03	1.6E-05	3.0E-03	3.0E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	4.5E-05	3.4E-02	3.4E-02	1.5E-05	1.5E-02	1.5E-02
Nitrate as nitrogen	NS	NS	NS	NS	NS	NS
Selenium	3.0E-04	4.6E-02	4.6E-02	1.0E-04	2.0E-02	2.0E-02
Silver	2.8E-04	7.0E-02	7.0E-02	9.4E-05	3.0E-02	3.0E-02
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	1.7E-02	2.6E+00	2.7E+00	5.9E-03	1.1E+00	1.1E+00
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.3E-02	3.5E+00	3.5E+00	7.7E-03	1.5E+00	1.5E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-34-80						
Aluminum	2.9E-05	4.4E-03	4.4E-03	9.8E-06	1.9E-03	1.9E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	1.8E-03	2.8E-01	2.8E-01	6.2E-04	1.2E-01	1.2E-01
Copper	3.9E-05	5.9E-03	5.9E-03	1.3E-05	2.5E-03	2.5E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.4E-05	2.6E-02	2.6E-02	1.2E-05	1.1E-02	1.1E-02
Nitrate as nitrogen	NS	NS	NS	NS	NS	NS
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.9E-03	3.1E-01	3.2E-01	6.5E-04	1.3E-01	1.3E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-34-100						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.0E-01	1.5E+01	1.5E+01	6.8E-02	6.5E+00	6.6E+00
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.1E-03	4.7E-01	4.7E-01	1.0E-03	2.0E-01	2.0E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.0E-01	1.6E+01	1.6E+01	6.9E-02	6.7E+00	6.8E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-35-60						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.0E-02	7.9E-01	8.0E-01	3.5E-03	3.4E-01	3.4E-01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.0E-02	7.9E-01	8.0E-01	3.5E-03	3.4E-01	3.4E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-35-135						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	7.4E-03	5.6E-01	5.7E-01	2.5E-03	2.4E-01	2.4E-01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	7.4E-03	5.6E-01	5.7E-01	2.5E-03	2.4E-01	2.4E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-36-90						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	7.2E-01	5.4E+01	5.5E+01	2.4E-01	2.3E+01	2.3E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	7.2E-01	5.4E+01	5.5E+01	2.4E-01	2.3E+01	2.3E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-36-100						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	4.4E-01	3.3E+01	3.3E+01	1.5E-01	1.4E+01	1.4E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	4.4E-01	3.3E+01	3.3E+01	1.5E-01	1.4E+01	1.4E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-37D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	4.4E-01	3.4E+01	3.4E+01	1.5E-01	1.4E+01	1.5E+01
Cobalt	1.5E-03	2.3E-01	2.3E-01	5.1E-04	9.7E-02	9.7E-02
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.0E-03	6.0E-01	6.1E-01	1.4E-03	2.6E-01	2.6E-01
Nickel	2.3E-05	1.8E-02	1.8E-02	7.9E-06	7.6E-03	7.6E-03
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	4.5E-01	3.4E+01	3.5E+01	1.5E-01	1.5E+01	1.5E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-38S						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.5E-01	1.9E+01	1.9E+01	8.4E-02	8.1E+00	8.2E+00
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	5.4E-03	8.1E-01	8.2E-01	1.8E-03	3.5E-01	3.5E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	2.6E-03	3.9E-01	3.9E-01	8.8E-04	1.7E-01	1.7E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.6E-01	2.0E+01	2.0E+01	8.7E-02	8.6E+00	8.7E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-38D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	6.2E-02	4.7E+00	4.7E+00	2.1E-02	2.0E+00	2.0E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	6.7E-03	1.0E+00	1.0E+00	2.3E-03	4.4E-01	4.4E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.2E-03	1.8E-01	1.8E-01	3.9E-04	7.5E-02	7.6E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	6.9E-02	5.9E+00	5.9E+00	2.4E-02	2.5E+00	2.5E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-39-50						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	4.7E-01	3.6E+01	3.6E+01	1.6E-01	1.5E+01	1.6E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	6.2E-04	9.4E-02	9.5E-02	2.1E-04	4.0E-02	4.0E-02
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	4.7E-01	3.6E+01	3.6E+01	1.6E-01	1.5E+01	1.6E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-39-60						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	8.2E-01	6.2E+01	6.3E+01	2.8E-01	2.7E+01	2.7E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	4.8E-04	7.3E-02	7.4E-02	1.6E-04	3.1E-02	3.1E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	8.2E-01	6.2E+01	6.3E+01	2.8E-01	2.7E+01	2.7E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-39-70						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.2E+00	9.1E+01	9.3E+01	4.1E-01	3.9E+01	4.0E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	6.6E-04	1.0E-01	1.0E-01	2.2E-04	4.3E-02	4.3E-02
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.2E+00	9.2E+01	9.3E+01	4.1E-01	3.9E+01	4.0E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-39-80						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.2E+00	9.4E+01	9.5E+01	4.2E-01	4.0E+01	4.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	1.2E-03	1.8E-01	1.8E-01	4.1E-04	7.8E-02	7.9E-02
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.2E+00	9.4E+01	9.5E+01	4.2E-01	4.0E+01	4.1E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-39-100						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	2.2E+00	1.7E+02	1.7E+02	7.5E-01	7.2E+01	7.3E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	1.1E-03	1.7E-01	1.7E-01	3.8E-04	7.4E-02	7.4E-02
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	2.2E+00	1.7E+02	1.7E+02	7.5E-01	7.2E+01	7.3E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-40S						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.5E-03	2.3E-01	2.4E-01	5.2E-04	1.0E-01	1.0E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.5E-03	2.3E-01	2.4E-01	5.2E-04	1.0E-01	1.0E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-40D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	2.3E-02	1.8E+00	1.8E+00	7.9E-03	7.6E-01	7.7E-01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	3.9E-03	5.9E-01	5.9E-01	1.3E-03	2.5E-01	2.5E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	2.0E-03	3.1E-01	3.1E-01	6.9E-04	1.3E-01	1.3E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.9E-02	2.7E+00	2.7E+00	9.9E-03	1.1E+00	1.2E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-43-25						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	3.1E-02	4.7E+00	4.7E+00	1.1E-02	2.0E+00	2.0E+00
Barium	ND	ND	ND	ND	ND	ND
Beryllium	1.5E-04	2.2E-02	2.3E-02	5.0E-05	9.6E-03	9.6E-03
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	NS	NS	NS	NS	NS	NS
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	3.1E-02	4.7E+00	4.8E+00	1.1E-02	2.0E+00	2.0E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-44-115						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	3.8E-01	2.9E+01	2.9E+01	1.3E-01	1.2E+01	1.2E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	6.8E-03	1.0E+00	1.0E+00	2.3E-03	4.4E-01	4.4E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	3.9E-01	3.0E+01	3.0E+01	1.3E-01	1.3E+01	1.3E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-44-125						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.1E-01	8.1E+00	8.2E+00	3.6E-02	3.5E+00	3.5E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	1.1E-02	1.6E+00	1.6E+00	3.6E-03	6.8E-01	6.9E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.1E-03	1.6E-01	1.6E-01	3.6E-04	7.0E-02	7.0E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.2E-01	9.8E+00	9.9E+00	4.0E-02	4.2E+00	4.2E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-45-095a						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	5.9E-02	4.4E+00	4.5E+00	2.0E-02	1.9E+00	1.9E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	5.9E-02	4.4E+00	4.5E+00	2.0E-02	1.9E+00	1.9E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-46-175						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	5.0E-02	3.8E+00	3.8E+00	1.7E-02	1.6E+00	1.6E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	1.7E-02	2.5E+00	2.5E+00	5.6E-03	1.1E+00	1.1E+00
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	6.6E-02	6.3E+00	6.3E+00	2.2E-02	2.7E+00	2.7E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-47-55						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.5E-02	1.2E+00	1.2E+00	5.2E-03	5.0E-01	5.1E-01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.5E-02	1.2E+00	1.2E+00	5.2E-03	5.0E-01	5.1E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-50-095						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	7.7E-02	5.8E+00	5.9E+00	2.6E-02	2.5E+00	2.5E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	7.7E-02	5.8E+00	5.9E+00	2.6E-02	2.5E+00	2.5E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-50-200						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	3.1E+00	2.3E+02	2.4E+02	1.0E+00	9.9E+01	1.0E+02
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.9E-03	5.9E-01	5.9E-01	1.3E-03	2.5E-01	2.5E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.6E-03	2.4E-01	2.4E-01	5.4E-04	1.0E-01	1.0E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	3.1E+00	2.3E+02	2.4E+02	1.0E+00	1.0E+02	1.0E+02

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-51						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.3E+00	9.6E+01	9.7E+01	4.3E-01	4.1E+01	4.2E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.1E-03	4.7E-01	4.8E-01	1.1E-03	2.0E-01	2.0E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	3.7E-03	5.6E-01	5.7E-01	1.3E-03	2.4E-01	2.4E-01
Selenium	1.3E-03	2.0E-01	2.0E-01	4.4E-04	8.4E-02	8.5E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.3E+00	9.7E+01	9.9E+01	4.3E-01	4.2E+01	4.2E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-1S						
Aluminum	1.4E-05	2.1E-03	2.1E-03	4.7E-06	9.0E-04	9.1E-04
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.4E-05	2.1E-03	2.1E-03	4.7E-06	9.0E-04	9.1E-04

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-1M						
Aluminum	1.3E-05	2.0E-03	2.0E-03	4.5E-06	8.7E-04	8.7E-04
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.2E-04	3.3E-02	3.3E-02	7.4E-05	1.4E-02	1.4E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	4.9E-05	7.4E-03	7.4E-03	1.7E-05	3.2E-03	3.2E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.8E-04	4.2E-02	4.3E-02	9.5E-05	1.8E-02	1.8E-02

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-1D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.3E-04	3.4E-02	3.4E-02	7.7E-05	1.5E-02	1.5E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	5.6E-05	8.5E-03	8.6E-03	1.9E-05	3.6E-03	3.7E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.7E-03	4.1E-01	4.2E-01	9.3E-04	1.8E-01	1.8E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	4.5E-03	6.9E-01	6.9E-01	1.5E-03	2.9E-01	3.0E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	7.5E-03	1.1E+00	1.2E+00	2.6E-03	4.9E-01	4.9E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-2S						
Aluminum	1.7E-05	2.6E-03	2.6E-03	5.9E-06	1.1E-03	1.1E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.7E-04	4.2E-02	4.2E-02	9.3E-05	1.8E-02	1.8E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.1E-02	8.5E-01	8.6E-01	3.8E-03	3.6E-01	3.7E-01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.0E-03	6.1E-01	6.1E-01	1.4E-03	2.6E-01	2.6E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.3E-03	2.0E-01	2.0E-01	4.4E-04	8.4E-02	8.5E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.7E-02	1.7E+00	1.7E+00	5.7E-03	7.3E-01	7.3E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-2M						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.8E-04	4.2E-02	4.2E-02	9.4E-05	1.8E-02	1.8E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	5.0E-05	7.6E-03	7.7E-03	1.7E-05	3.3E-03	3.3E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	9.3E-04	1.4E-01	1.4E-01	3.1E-04	6.0E-02	6.1E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.3E-03	1.9E-01	1.9E-01	4.3E-04	8.1E-02	8.2E-02

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-2D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.8E-04	4.3E-02	4.3E-02	9.6E-05	1.8E-02	1.8E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	5.2E-05	7.9E-03	8.0E-03	1.8E-05	3.4E-03	3.4E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.5E-03	5.3E-01	5.3E-01	1.2E-03	2.3E-01	2.3E-01
Nickel	2.9E-05	2.2E-02	2.2E-02	9.9E-06	9.5E-03	9.5E-03
Nitrate as nitrogen	1.3E-03	1.9E-01	1.9E-01	4.3E-04	8.3E-02	8.3E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	1.2E-04	2.9E-02	2.9E-02	3.9E-05	1.3E-02	1.3E-02
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	5.2E-03	8.2E-01	8.3E-01	1.8E-03	3.5E-01	3.5E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-3D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.2E-03	4.8E-01	4.8E-01	1.1E-03	2.0E-01	2.1E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	3.2E-03	4.8E-01	4.8E-01	1.1E-03	2.0E-01	2.1E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-5S						
Aluminum	1.3E-05	2.0E-03	2.0E-03	4.5E-06	8.6E-04	8.7E-04
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	7.5E-03	5.7E-01	5.8E-01	2.5E-03	2.4E-01	2.5E-01
Cobalt	2.6E-03	3.9E-01	4.0E-01	8.8E-04	1.7E-01	1.7E-01
Copper	4.8E-05	7.2E-03	7.3E-03	1.6E-05	3.1E-03	3.1E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.2E-03	1.8E-01	1.8E-01	4.0E-04	7.7E-02	7.7E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	3.2E-04	8.1E-02	8.1E-02	1.1E-04	3.5E-02	3.5E-02
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.2E-02	1.2E+00	1.2E+00	4.0E-03	5.3E-01	5.3E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-5M						
Aluminum	3.4E-05	5.2E-03	5.2E-03	1.2E-05	2.2E-03	2.2E-03
Antimony	2.4E-03	3.7E-01	3.7E-01	8.2E-04	1.6E-01	1.6E-01
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	3.8E-04	5.8E-02	5.8E-02	1.3E-04	2.5E-02	2.5E-02
Cadmium	1.5E-03	2.2E-01	2.2E-01	4.9E-04	9.5E-02	9.5E-02
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	3.4E-03	5.2E-01	5.2E-01	1.2E-03	2.2E-01	2.2E-01
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.7E-03	4.0E-01	4.1E-01	9.0E-04	1.7E-01	1.7E-01
Nickel	3.2E-05	2.4E-02	2.4E-02	1.1E-05	1.0E-02	1.0E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	3.4E-04	5.1E-02	5.2E-02	1.1E-04	2.2E-02	2.2E-02
Silver	1.6E-04	4.0E-02	4.0E-02	5.4E-05	1.7E-02	1.7E-02
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	3.7E-03	5.6E-01	5.6E-01	1.2E-03	2.4E-01	2.4E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.5E-02	2.2E+00	2.3E+00	4.9E-03	9.6E-01	9.7E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-5D						
Aluminum	2.8E-05	4.2E-03	4.3E-03	9.5E-06	1.8E-03	1.8E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.2E-04	3.3E-02	3.3E-02	7.4E-05	1.4E-02	1.4E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	5.1E-05	7.7E-03	7.8E-03	1.7E-05	3.3E-03	3.3E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.0E-03	6.1E-01	6.1E-01	1.4E-03	2.6E-01	2.6E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	4.3E-03	6.5E-01	6.6E-01	1.5E-03	2.8E-01	2.8E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	8.6E-03	1.3E+00	1.3E+00	2.9E-03	5.6E-01	5.6E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PE-1						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	2.8E-02	2.1E+00	2.2E+00	9.5E-03	9.1E-01	9.2E-01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	2.8E-02	2.1E+00	2.2E+00	9.5E-03	9.1E-01	9.2E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PGE-6						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	3.3E-01	2.5E+01	2.6E+01	1.1E-01	1.1E+01	1.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	1.5E-04	2.3E-02	2.3E-02	5.1E-05	9.9E-03	9.9E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	2.6E-05	2.0E-02	2.0E-02	9.0E-06	8.6E-03	8.6E-03
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	5.7E-04	1.4E-01	1.4E-01	1.9E-04	6.2E-02	6.2E-02
Cumulative noncancer hazard index	3.3E-01	2.5E+01	2.6E+01	1.1E-01	1.1E+01	1.1E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PGE-7						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.6E+00	1.2E+02	1.2E+02	5.3E-01	5.1E+01	5.2E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	2.0E-04	3.0E-02	3.0E-02	6.7E-05	1.3E-02	1.3E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	4.6E-03	7.0E-01	7.1E-01	1.6E-03	3.0E-01	3.0E-01
Nickel	3.3E-05	2.5E-02	2.5E-02	1.1E-05	1.1E-02	1.1E-02
Nitrate as nitrogen	2.1E-03	3.1E-01	3.1E-01	7.0E-04	1.3E-01	1.3E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	4.4E-05	1.1E-02	1.1E-02	1.5E-05	4.8E-03	4.8E-03
Cumulative noncancer hazard index	1.6E+00	1.2E+02	1.2E+02	5.3E-01	5.1E+01	5.2E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PGE-8						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	5.8E-03	8.9E-01	8.9E-01	2.0E-03	3.8E-01	3.8E-01
Nickel	5.6E-05	4.3E-02	4.3E-02	1.9E-05	1.8E-02	1.8E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	2.6E-04	6.6E-02	6.6E-02	8.9E-05	2.8E-02	2.8E-02
Cumulative noncancer hazard index	6.2E-03	9.9E-01	1.0E+00	2.1E-03	4.3E-01	4.3E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
Park Moabi-4						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	3.8E-03	5.8E-01	5.8E-01	1.3E-03	2.5E-01	2.5E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	5.1E-04	1.3E-01	1.3E-01	1.7E-04	5.5E-02	5.5E-02
Cumulative noncancer hazard index	4.3E-03	7.0E-01	7.1E-01	1.5E-03	3.0E-01	3.0E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-1D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	7.8E-01	5.9E+01	6.0E+01	2.7E-01	2.5E+01	2.6E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	7.8E-01	5.9E+01	6.0E+01	2.7E-01	2.5E+01	2.6E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-2D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	5.6E-01	4.2E+01	4.3E+01	1.9E-01	1.8E+01	1.8E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	5.6E-01	4.2E+01	4.3E+01	1.9E-01	1.8E+01	1.8E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-3D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.2E+00	9.4E+01	9.5E+01	4.2E-01	4.0E+01	4.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.2E+00	9.4E+01	9.5E+01	4.2E-01	4.0E+01	4.1E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-4D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.7E+00	1.3E+02	1.3E+02	5.7E-01	5.4E+01	5.5E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.7E+00	1.3E+02	1.3E+02	5.7E-01	5.4E+01	5.5E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-5D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	8.7E-01	6.6E+01	6.6E+01	2.9E-01	2.8E+01	2.8E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	8.7E-01	6.6E+01	6.6E+01	2.9E-01	2.8E+01	2.8E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-6D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	7.8E-01	5.9E+01	6.0E+01	2.7E-01	2.5E+01	2.6E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	7.8E-01	5.9E+01	6.0E+01	2.7E-01	2.5E+01	2.6E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-7S						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	3.4E-01	2.6E+01	2.6E+01	1.1E-01	1.1E+01	1.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	5.8E-03	8.8E-01	8.8E-01	2.0E-03	3.8E-01	3.8E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	3.4E-01	2.6E+01	2.7E+01	1.2E-01	1.1E+01	1.1E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-7M						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	6.5E-01	4.9E+01	5.0E+01	2.2E-01	2.1E+01	2.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	6.6E-03	1.0E+00	1.0E+00	2.3E-03	4.3E-01	4.3E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	6.6E-01	5.0E+01	5.1E+01	2.2E-01	2.2E+01	2.2E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-7D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	2.0E+00	1.5E+02	1.6E+02	6.9E-01	6.6E+01	6.7E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	2.0E-03	3.0E-01	3.0E-01	6.6E-04	1.3E-01	1.3E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	2.0E+00	1.5E+02	1.6E+02	6.9E-01	6.6E+01	6.7E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-8S						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	4.9E-01	3.7E+01	3.8E+01	1.7E-01	1.6E+01	1.6E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	6.6E-03	1.0E+00	1.0E+00	2.2E-03	4.3E-01	4.3E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	5.0E-01	3.8E+01	3.9E+01	1.7E-01	1.6E+01	1.7E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-8M						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.1E+00	8.4E+01	8.5E+01	3.8E-01	3.6E+01	3.7E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	8.4E-03	1.3E+00	1.3E+00	2.8E-03	5.4E-01	5.5E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.1E+00	8.6E+01	8.7E+01	3.8E-01	3.7E+01	3.7E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-8D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.8E+00	1.4E+02	1.4E+02	6.2E-01	6.0E+01	6.0E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	2.6E-03	3.9E-01	3.9E-01	8.7E-04	1.7E-01	1.7E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.8E+00	1.4E+02	1.4E+02	6.2E-01	6.0E+01	6.1E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-9S						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	3.3E-01	2.5E+01	2.5E+01	1.1E-01	1.1E+01	1.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	4.3E-03	6.6E-01	6.6E-01	1.5E-03	2.8E-01	2.8E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	3.4E-01	2.6E+01	2.6E+01	1.1E-01	1.1E+01	1.1E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-9M						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	6.6E-01	5.0E+01	5.1E+01	2.2E-01	2.1E+01	2.2E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	6.5E-03	9.8E-01	9.9E-01	2.2E-03	4.2E-01	4.2E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	6.6E-01	5.1E+01	5.2E+01	2.3E-01	2.2E+01	2.2E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-9D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	4.4E+00	3.3E+02	3.4E+02	1.5E+00	1.4E+02	1.4E+02
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	2.5E-03	3.7E-01	3.7E-01	8.3E-04	1.6E-01	1.6E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	4.4E+00	3.3E+02	3.4E+02	1.5E+00	1.4E+02	1.5E+02

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PTI-1D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	9.4E-01	7.1E+01	7.2E+01	3.2E-01	3.1E+01	3.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	9.4E-01	7.1E+01	7.2E+01	3.2E-01	3.1E+01	3.1E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PTR-1						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.5E-01	1.1E+01	1.2E+01	5.1E-02	4.9E+00	5.0E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	4.9E-03	7.4E-01	7.4E-01	1.6E-03	3.2E-01	3.2E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.6E-01	1.2E+01	1.2E+01	5.3E-02	5.2E+00	5.3E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PTR-2						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	9.0E-01	6.8E+01	6.9E+01	3.0E-01	2.9E+01	2.9E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	6.8E-03	1.0E+00	1.0E+00	2.3E-03	4.4E-01	4.4E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	9.0E-01	6.9E+01	7.0E+01	3.1E-01	3.0E+01	3.0E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
TW-1						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.2E+00	8.8E+01	8.9E+01	3.9E-01	3.8E+01	3.8E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.4E-03	2.2E-01	2.2E-01	4.8E-04	9.3E-02	9.3E-02
Selenium	9.0E-03	1.4E+00	1.4E+00	3.1E-03	5.9E-01	5.9E-01
Silver	1.3E-03	3.3E-01	3.4E-01	4.5E-04	1.4E-01	1.4E-01
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	6.8E-05	1.7E-02	1.7E-02	2.3E-05	7.3E-03	7.4E-03
Cumulative noncancer hazard index	1.2E+00	9.0E+01	9.1E+01	4.0E-01	3.9E+01	3.9E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
TW-2S						
Aluminum	2.7E-05	4.1E-03	4.1E-03	9.1E-06	1.7E-03	1.8E-03
Antimony	5.5E-02	8.3E+00	8.4E+00	1.9E-02	3.6E+00	3.6E+00
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.4E+00	1.0E+02	1.1E+02	4.6E-01	4.4E+01	4.5E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.6E-03	2.4E-01	2.4E-01	5.4E-04	1.0E-01	1.0E-01
Selenium	7.2E-04	1.1E-01	1.1E-01	2.4E-04	4.7E-02	4.7E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	7.7E-05	1.9E-02	1.9E-02	2.6E-05	8.3E-03	8.3E-03
Cumulative noncancer hazard index	1.4E+00	1.1E+02	1.1E+02	4.8E-01	4.8E+01	4.9E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
TW-2D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	5.6E-02	8.4E+00	8.5E+00	1.9E-02	3.6E+00	3.6E+00
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.5E+00	1.2E+02	1.2E+02	5.3E-01	5.0E+01	5.1E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.6E-03	5.5E-01	5.5E-01	1.2E-03	2.3E-01	2.4E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.6E+00	1.3E+02	1.3E+02	5.5E-01	5.4E+01	5.5E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
TW-3D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	8.0E-01	6.0E+01	6.1E+01	2.7E-01	2.6E+01	2.6E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	8.0E-01	6.0E+01	6.1E+01	2.7E-01	2.6E+01	2.6E+01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
TW-4						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	5.7E-03	4.3E-01	4.4E-01	1.9E-03	1.9E-01	1.9E-01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	5.7E-03	4.3E-01	4.4E-01	1.9E-03	1.9E-01	1.9E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-1M						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	1.3E-03	2.0E-01	2.0E-01	4.5E-04	8.6E-02	8.6E-02
Zinc	4.1E-05	1.0E-02	1.0E-02	1.4E-05	4.4E-03	4.4E-03
Cumulative noncancer hazard index	1.4E-03	2.1E-01	2.1E-01	4.6E-04	9.0E-02	9.1E-02

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-1D						
Aluminum	1.6E-05	2.4E-03	2.4E-03	5.3E-06	1.0E-03	1.0E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.4E-04	3.6E-02	3.7E-02	8.2E-05	1.6E-02	1.6E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.4E-03	5.2E-01	5.2E-01	1.2E-03	2.2E-01	2.2E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	1.4E-03	2.1E-01	2.1E-01	4.7E-04	9.0E-02	9.0E-02
Zinc	3.2E-05	8.2E-03	8.2E-03	1.1E-05	3.5E-03	3.5E-03
Cumulative noncancer hazard index	5.1E-03	7.7E-01	7.8E-01	1.7E-03	3.3E-01	3.3E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-2M						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	1.6E-03	2.4E-01	2.4E-01	5.3E-04	1.0E-01	1.0E-01
Zinc	3.3E-05	8.3E-03	8.3E-03	1.1E-05	3.5E-03	3.6E-03
Cumulative noncancer hazard index	1.6E-03	2.5E-01	2.5E-01	5.4E-04	1.1E-01	1.1E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-2D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.4E-04	3.6E-02	3.7E-02	8.2E-05	1.6E-02	1.6E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	3.1E-02	4.6E+00	4.7E+00	1.0E-02	2.0E+00	2.0E+00
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	5.2E-03	7.8E-01	7.9E-01	1.8E-03	3.4E-01	3.4E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	1.8E-03	2.7E-01	2.7E-01	5.9E-04	1.1E-01	1.1E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	3.8E-02	5.7E+00	5.8E+00	1.3E-02	2.5E+00	2.5E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-3M						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.1E-04	3.2E-02	3.2E-02	7.1E-05	1.4E-02	1.4E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.5E-03	3.8E-01	3.8E-01	8.5E-04	1.6E-01	1.6E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.1E-03	1.7E-01	1.7E-01	3.8E-04	7.3E-02	7.3E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	1.3E-03	2.0E-01	2.0E-01	4.4E-04	8.5E-02	8.5E-02
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	5.2E-03	7.8E-01	7.9E-01	1.7E-03	3.3E-01	3.4E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-3D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.4E-04	3.6E-02	3.7E-02	8.2E-05	1.6E-02	1.6E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	5.5E-03	8.3E-01	8.4E-01	1.9E-03	3.6E-01	3.6E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	1.7E-02	2.6E+00	2.7E+00	5.9E-03	1.1E+00	1.1E+00
Vanadium	1.5E-03	2.3E-01	2.3E-01	5.2E-04	1.0E-01	1.0E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.5E-02	3.7E+00	3.8E+00	8.4E-03	1.6E+00	1.6E+00

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-4M						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.0E-04	3.0E-02	3.1E-02	6.8E-05	1.3E-02	1.3E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	6.1E-05	9.2E-03	9.3E-03	2.1E-05	4.0E-03	4.0E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	1.2E-03	1.8E-01	1.8E-01	3.9E-04	7.5E-02	7.6E-02
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.4E-03	2.1E-01	2.2E-01	4.8E-04	9.2E-02	9.3E-02

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-4D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.1E-04	3.2E-02	3.2E-02	7.2E-05	1.4E-02	1.4E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	4.8E-05	7.3E-03	7.3E-03	1.6E-05	3.1E-03	3.1E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.6E-03	5.4E-01	5.4E-01	1.2E-03	2.3E-01	2.3E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	1.3E-03	2.0E-01	2.0E-01	4.4E-04	8.5E-02	8.5E-02
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	5.1E-03	7.8E-01	7.8E-01	1.7E-03	3.3E-01	3.3E-01

Table G-5. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific: Sensitivity Analysis

	Groundwater Noncancer Health Hazard					
	On-Site Resident Child			On-Site Resident Adult		
Constituent of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard

Notes:

ND = not detected or not detected above background concentrations

NS = not sampled

Table G-6. Comparison of Estimated Lead EPCs to the California Action Level – Well-Specific: Sensitivity Analysis

Well	EPC (mg/L)	Screening Criteria (mg/L)	Ratio of EPC to Screening Criteria
MW-9	0.00224	0.015	0.15
MW-10	0.00249	0.015	0.17
MW-11	0.00144	0.015	0.096
MW-12	0.00176	0.015	0.12
MW-14	0.00326	0.015	0.22
MW-15	0.00254	0.015	0.17
MW-20-70	0.00125	0.015	0.083
MW-20-100	0.00574	0.015	0.38
MW-20-130	0.00377	0.015	0.25
MW-22	0.0163	0.015	1.1
MW-23	0.00638	0.015	0.43
MW-26	0.00193	0.015	0.13
MW-27-20	0.0097	0.015	0.65
MW-28-25	0.00677	0.015	0.45
MW-29	0.00277	0.015	0.18
MW-30-30	0.0381	0.015	2.5
MW-31-60	0.00551	0.015	0.37
MW-34-55	0.00236	0.015	0.16
MW-43-25	0.00247	0.015	0.16
MW-51	0.0026	0.015	0.17
OW-1S	0.00138	0.015	0.092

Table G-6. Comparison of Estimated Lead EPCs to the California Action Level – Well-Specific: Sensitivity Analysis

Well	EPC (mg/L)	Screening Criteria (mg/L)	Ratio of EPC to Screening Criteria
OW-1M	0.00132	0.015	0.088
OW-2M	0.00123	0.015	0.082
OW-2D	0.00129	0.015	0.086
OW-3S	0.00205	0.015	0.14
OW-3D	0.00173	0.015	0.12
OW-5S	0.00119	0.015	0.079
OW-5M	0.00171	0.015	0.11
OW-5D	0.00125	0.015	0.083
PGE-6	0.00367	0.015	0.24
TW-1	0.00204	0.015	0.14
CW-1M	0.00156	0.015	0.10
CW-1D	0.00139	0.015	0.093
CW-2M	0.00172	0.015	0.11
CW-3M	0.00131	0.015	0.087
CW-4M	0.00163	0.015	0.11

Notes:
(1) Screening criteria for lead is the California Action Level for lead because no MCL is promulgated.
(2) California Action Level for lead provided in CCR Title 22, Division 4, Chapter 17.5, Article 3, Section 64678.
(3) Wells where lead was either not detected or not sampled are not shown.

EPC = exposure point concentration
mg/L = milligram(s) per liter

Table G-7. Percentage Contributions by COPCs to Estimated Potential Cumulative Noncancer Hazard Indices: Future Hypothetical Child Groundwater User – Well-Specific: Sensitivity Analysis

Well	Cumulative Estimated Noncancer Hazard Index	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc
MW-1	2.71	0	ND	ND	ND	ND	ND	ND	ND	ND	84	ND	5	1	9	ND	ND	ND	ND	ND
MW-3	0.94	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	47	10	43	ND	ND	ND	ND	ND
MW-4	0.29	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	81	ND	ND	ND	ND	ND
MW-5	2.14	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	55	2	32	11	ND	ND	ND	ND
MW-6	8.48	0	ND	ND	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-7	0.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	89	ND	ND	ND	ND	ND
MW-8	1.68	ND	ND	ND	ND	ND	ND	55	ND	1	ND	ND	ND	2	43	ND	ND	ND	ND	ND
MW-9	8.11	ND	ND	ND	ND	ND	ND	93	ND	0	ND	ND	ND	0	4	2	1	ND	ND	1
MW-10	64.80	0	0	ND	ND	ND	ND	68	ND	0	27	ND	3	0	1	0	0	ND	1	0
MW-11	19.19	ND	ND	ND	0	ND	ND	97	ND	0	ND	ND	ND	0	2	1	ND	ND	ND	0
MW-12	56.20	0	1	40	ND	ND	ND	51	ND	0	ND	ND	1	0	ND	ND	ND	5	1	ND
MW-13	0.14	ND	ND	ND	ND	ND	ND	ND	ND	7	ND	ND	ND	60	ND	ND	ND	ND	ND	32
MW-14	1.49	ND	ND	ND	ND	ND	ND	63	11	1	ND	ND	ND	3	20	ND	ND	ND	ND	3
MW-15	0.59	NS	NS	ND	ND	NS	NS	59	NS	3	ND	NS	ND	4	27	ND	NS	NS	ND	7
MW-19	19.53	ND	ND	ND	ND	ND	ND	100	ND	0	ND	ND	ND	0	ND	ND	ND	ND	ND	0
MW-20-70	210.01	ND	0	ND	ND	ND	ND	99	ND	0	ND	ND	ND	0	0	0	ND	ND	0	0
MW-20-100	167.45	NS	4	ND	ND	ND	ND	95	ND	0	ND	ND	ND	0	0	ND	ND	ND	ND	0
MW-20-130	186.77	ND	ND	ND	ND	ND	ND	99	0	0	ND	ND	0	0	0	0	ND	ND	0	0
MW-21	0.97	ND	ND	ND	ND	ND	ND	ND	ND	4	ND	ND	40	16	ND	32	ND	ND	ND	7
MW-22	2.37	NS	ND	ND	3	ND	ND	ND	30	5	ND	2	19	20	4	ND	ND	ND	15	2
MW-23	0.71	NS	ND	ND	38	ND	ND	ND	ND	4	ND	ND	ND	37	ND	13	ND	ND	ND	8
MW-24A	76.54	NS	ND	4	0	ND	ND	95	ND	0	ND	ND	0	0	1	0	ND	ND	ND	0
MW-24B	107.85	ND	ND	ND	ND	ND	ND	98	ND	0	ND	ND	1	0	1	0	ND	ND	ND	0
MW-24BR	1.02	NS	NS	NS	7	NS	NS	27	NS	2	ND	NS	59	2	ND	NS	NS	NS	ND	2
MW-25	51.16	ND	ND	ND	ND	ND	ND	100	ND	0	ND	ND	ND	0	ND	0	ND	ND	ND	0
MW-26	81.44	NS	ND	ND	ND	ND	ND	99	ND	0	ND	ND	1	0	0	0	ND	ND	ND	0
MW-27-20	0.27	ND	NS	NS	20	NS	NS	ND	NS	11	ND	NS	ND	55	ND	NS	NS	NS	ND	14
MW-28-25	0.14	ND	NS	NS	45	NS	NS	ND	NS	10	ND	NS	ND	21	ND	NS	NS	NS	ND	24
MW-28-90	0.00	NS	NS	NS	ND	NS	NS	ND	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-29	0.14	NS	NS	NS	38	NS	NS	ND	NS	12	ND	NS	ND	24	ND	NS	NS	NS	ND	27
MW-30-30	2.33	ND	ND	ND	5	ND	ND	ND	ND	2	ND	ND	17	36	16	ND	ND	ND	21	2
MW-30-50	28.67	NS	NS	NS	ND	NS	NS	100	NS	0	ND	NS	NS	ND	ND	NS	NS	NS	NS	0
MW-31-60	84.49	ND	ND	ND	ND	ND	ND	99	ND	0	ND	ND	ND	0	0	ND	ND	ND	0	0
MW-31-135	6.13	NS	NS	ND	ND	NS	NS	100	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	ND
MW-32-20	1.67	ND	NS	NS	99	NS	NS	ND	NS	ND	ND	NS	NS	ND	ND	NS	NS	NS	NS	1
MW-32-35	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	ND	100
MW-33-40	9.17	ND	NS	NS	ND	NS	NS	ND	NS	0	100	NS	NS	ND	ND	NS	NS	NS	NS	0
MW-33-90	0.59	ND	ND	ND	ND	ND	ND	ND	ND	15	ND	ND	81	ND	ND	ND	ND	ND	ND	4
MW-33-150	0.00	NS	NS	NS	ND	NS	NS	ND	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-33-210	0.27	ND	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-34-55	3.51	ND	20	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	1	NS	1	2	ND	76	ND

Table G-7. Percentage Contributions by COPCs to Estimated Potential Cumulative Noncancer Hazard Indices: Future Hypothetical Child Groundwater User – Well-Specific: Sensitivity Analysis

Well	Cumulative Estimated Noncancer Hazard Index	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc
MW-34-80	0.32	1	ND	ND	ND	ND	ND	ND	88	2	ND	ND	ND	8	NS	ND	ND	ND	ND	ND
MW-34-100	15.84	ND	ND	ND	ND	ND	ND	97	ND	ND	ND	ND	3	ND	ND	ND	ND	ND	ND	ND
MW-35-60	0.80	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-35-135	0.57	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-36-20	0.00	NS	NS	NS	ND	NS	NS	ND	NS	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-36-40	0.00	NS	NS	NS	ND	NS	NS	ND	NS	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-36-50	0.00	NS	NS	NS	ND	NS	NS	ND	NS	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-36-70	0.00	NS	NS	NS	ND	NS	NS	ND	NS	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-36-90	54.95	NS	NS	NS	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-36-100	33.49	NS	NS	NS	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-37S	0.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-37D	34.86	ND	ND	ND	ND	ND	ND	98	1	ND	ND	ND	2	0	ND	ND	ND	ND	ND	ND
MW-38S	20.34	ND	ND	ND	ND	ND	ND	94	ND	ND	ND	ND	4	ND	2	ND	ND	ND	ND	ND
MW-38D	5.93	NS	NS	ND	ND	NS	NS	80	NS	ND	ND	NS	17	ND	3	ND	NS	NS	ND	ND
MW-39-40	0.00	NS	NS	NS	ND	NS	NS	ND	NS	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-39-50	36.41	NS	NS	NS	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	0	NS	NS	NS	NS	NS
MW-39-60	63.14	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	0	ND	ND	ND	ND	ND
MW-39-70	92.72	NS	NS	NS	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	0	NS	NS	NS	NS	NS
MW-39-80	95.12	NS	NS	NS	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	0	NS	NS	NS	NS	NS
MW-39-100	170.09	NS	NS	NS	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	0	NS	NS	NS	NS	NS
MW-40S	0.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND
MW-40D	2.70	NS	NS	ND	ND	NS	NS	67	NS	ND	ND	NS	22	ND	11	ND	NS	NS	ND	ND
MW-41S	0.00	NS	NS	NS	NS	NS	NS	ND	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-41M	0.00	NS	NS	NS	NS	NS	NS	ND	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-43-25	4.76	ND	ND	100	ND	0	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	ND	ND
MW-43-75	0.00	ND	NS	NS	ND	NS	NS	ND	NS	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-43-90	0.00	ND	NS	NS	ND	NS	NS	ND	NS	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-44-115	30.10	NS	ND	ND	ND	ND	ND	97	ND	ND	NS	ND	3	ND	ND	ND	ND	ND	ND	ND
MW-44-125	9.93	NS	NS	ND	ND	NS	NS	82	NS	ND	ND	NS	16	ND	2	ND	NS	NS	ND	ND
MW-45-095a	4.49	NS	NS	ND	ND	NS	NS	100	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	ND
MW-46-175	6.32	NS	NS	ND	ND	NS	NS	60	NS	ND	ND	NS	40	ND	ND	ND	NS	NS	ND	ND
MW-46-205	0.00	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-47-55	1.18	NS	NS	ND	ND	NS	NS	100	NS	ND	ND	NS	ND	ND	ND	ND	NS	NS	ND	ND
MW-47-115	0.00	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-49-135	0.00	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-49-275	0.00	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-50-095	5.89	NS	NS	NS	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-50-200	235.96	NS	ND	ND	ND	ND	ND	100	ND	ND	NS	ND	0	ND	0	ND	ND	ND	ND	ND
MW-51	98.61	NS	ND	ND	ND	ND	ND	99	ND	ND	NS	ND	0	ND	1	0	ND	ND	ND	ND
MW-52S	0.00	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-52M	0.00	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS

Table G-7. Percentage Contributions by COPCs to Estimated Potential Cumulative Noncancer Hazard Indices: Future Hypothetical Child Groundwater User – Well-Specific: Sensitivity Analysis

Well	Cumulative Estimated Noncancer Hazard Index	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc
MW-52D	0.00	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
MW-53M	0.00	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
OW-1S	0.00	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OW-1M	0.04	5	ND	ND	ND	78	ND	ND	ND	17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OW-1D	1.15	ND	ND	ND	ND	3	ND	ND	ND	1	ND	ND	36	ND	ND	ND	ND	ND	60	ND
OW-2S	1.71	0	ND	ND	ND	2	ND	50	ND	ND	ND	ND	36	ND	12	ND	ND	ND	ND	ND
OW-2M	0.19	ND	ND	ND	ND	22	ND	ND	ND	4	ND	ND	ND	ND	74	ND	ND	ND	ND	ND
OW-2D	0.83	ND	ND	ND	ND	5	ND	ND	ND	1	ND	ND	64	3	23	ND	4	ND	ND	ND
OW-3S	0.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OW-3M	0.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OW-3D	0.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND
OW-5S	1.24	0	ND	ND	ND	ND	ND	46	32	1	ND	ND	ND	ND	15	ND	7	ND	ND	ND
OW-5M	2.26	0	16	ND	ND	3	10	ND	23	ND	ND	ND	18	1	ND	2	2	ND	25	ND
OW-5D	1.32	0	ND	ND	ND	3	ND	ND	ND	1	ND	ND	47	ND	ND	ND	ND	ND	50	ND
PE-1	2.16	NS	NS	ND	ND	NS	NS	100	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS
PGE-6	25.73	NS	NS	NS	ND	NS	NS	99	NS	0	ND	NS	ND	0	ND	NS	NS	NS	ND	1
PGE-7	121.58	NS	NS	NS	ND	NS	NS	99	NS	0	ND	NS	1	0	0	NS	NS	NS	ND	0
PGE-8	1.00	NS	NS	NS	ND	NS	NS	ND	NS	ND	ND	NS	89	4	ND	NS	NS	NS	ND	7
Park Moabi-4	0.71	NS	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	ND	82	ND	ND	ND	ND	18
PT-1D	60.02	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-2D	42.96	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-3S	0.00	NS	NS	ND	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
PT-3D	95.43	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-4D	128.68	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-5D	66.50	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-6D	60.24	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PT-7S	26.79	NS	NS	ND	NS	NS	NS	97	NS	NS	NS	NS	NS	NS	3	NS	NS	NS	NS	NS
PT-7M	51.10	NS	NS	ND	NS	NS	NS	98	NS	NS	NS	NS	NS	NS	2	NS	NS	NS	NS	NS
PT-7D	157.04	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	0	NS	NS	NS	NS	NS
PT-8S	38.79	NS	NS	ND	NS	NS	NS	97	NS	NS	NS	NS	NS	NS	3	NS	NS	NS	NS	NS
PT-8M	86.78	NS	NS	ND	NS	NS	NS	99	NS	NS	NS	NS	NS	NS	1	NS	NS	NS	NS	NS
PT-8D	141.59	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	0	NS	NS	NS	NS	NS
PT-9S	26.14	NS	NS	ND	NS	NS	NS	97	NS	NS	NS	NS	NS	NS	3	NS	NS	NS	NS	NS
PT-9M	51.51	NS	NS	ND	NS	NS	NS	98	NS	NS	NS	NS	NS	NS	2	NS	NS	NS	NS	NS
PT-9D	339.34	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	0	NS	NS	NS	NS	NS
PTI-1D	72.33	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
PTR-1	12.36	NS	NS	ND	NS	NS	NS	94	NS	NS	NS	NS	NS	NS	6	NS	NS	NS	NS	NS
PTR-2	69.91	NS	NS	ND	NS	NS	NS	99	NS	NS	NS	NS	NS	NS	1	NS	NS	NS	NS	NS
TW-1	91.33	ND	ND	ND	ND	ND	ND	98	ND	ND	NS	ND	ND	ND	0	2	0	ND	ND	0
TW-2S	113.85	0	7	ND	ND	ND	ND	92	ND	ND	ND	ND	ND	ND	0	0	ND	ND	ND	0
TW-2D	127.94	ND	7	ND	ND	ND	ND	93	ND	ND	ND	ND	0	ND	ND	ND	ND	ND	ND	ND

Table G-7. Percentage Contributions by COPCs to Estimated Potential Cumulative Noncancer Hazard Indices: Future Hypothetical Child Groundwater User – Well-Specific: Sensitivity Analysis

Well	Cumulative Estimated Noncancer Hazard Index	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium, hexavalent	Cobalt	Copper	Fluoride	Mercury	Molybdenum	Nickel	Nitrate as nitrogen	Selenium	Silver	Thallium	Vanadium	Zinc
TW-3D	61.27	NS	NS	ND	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
TW-4	0.44	NS	NS	NS	NS	NS	NS	100	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
TW-5	0.00	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS	NS	ND	NS	NS	NS	NS	NS
CW-1M	0.21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	95	5
CW-1D	0.78	0	ND	ND	ND	5	ND	ND	ND	ND	ND	ND	67	ND	ND	ND	ND	ND	27	1
CW-2M	0.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	97	3
CW-2D	5.77	ND	ND	ND	ND	1	ND	ND	ND	ND	81	ND	14	ND	ND	ND	ND	ND	5	ND
CW-3M	0.79	ND	ND	ND	ND	4	ND	ND	ND	ND	ND	ND	49	ND	22	ND	ND	ND	25	ND
CW-3D	3.76	ND	ND	ND	ND	1	ND	ND	ND	ND	ND	ND	22	ND	ND	ND	ND	70	6	ND
CW-4M	0.22	ND	ND	ND	ND	14	ND	ND	ND	4	ND	ND	ND	ND	ND	ND	ND	ND	82	ND
CW-4D	0.78	ND	ND	ND	ND	4	ND	ND	ND	1	ND	ND	69	ND	ND	ND	ND	ND	25	ND
Cumulative Hazard	4330	0	1	1	0	0	0	96	0	0	1	0	1	0	0	0	0	0	0	0

Notes:

(1) Shown is the percentage contribution by COPCs to the estimated potential cumulative noncancer hazard index for the hypothetical child groundwater user.

COPC = constituent of potential concern
ND = not detected or not detected above background concentrations
NS = not sampled

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Appendix H

Human Health and Ecological Surface Water Criteria
(Tables 5-1 and 7-1 from RAWP [ARCADIS, 2008])

Table 5-1
Human Health Surface Water Screening Values
PG&E Topock
Needles, California
Human Health and Ecological Risk Assessment Work Plan

California Code of Regulations Title 22 Metals	California Primary Maximum Contaminant Level	California Toxic Rule Criteria		National Ambient Water Quality Criteria				Chosen Criteria[a]
		Inland Surface Waters		For Human Health and Welfare Protection				
		Human Health (30-day average)		Noncancer Health Effects		One-in-a-Million Cancer Risk Estimate		
		Drinking Water Sources (consumption of water and aquatic organisms)	Other Waters (consumption of aquatic organisms only)	Drinking Water Sources (consumption of water and aquatic organisms)	Other Waters (consumption of aquatic organisms only)	Drinking Water Sources (consumption of water and aquatic organisms)	Other Waters (consumption of aquatic organisms only)	
Aluminum	1000	NA	NA	NA	NA	NA	NA	1000
Antimony	6	14	4300	5.6	640	NA	NA	6
Arsenic	10	NA	NA	NA	NA	0.018	0.14	10 [b]
Barium	1000	NA	NA	1000	NA	NA	NA	1000
Beryllium	4	NA	NA	NA	NA	NA	NA	4
Cadmium	5	NA	NA	NA	NA	NA	NA	5
Chromium, hexavalent	NA	NA	NA	NA	NA	NA	NA	NA
Chromium, total	50	NA	NA	NA	NA	NA	NA	50
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1000 [c]	1300	NA	1300	NA	NA	NA	1000
Lead	15 [d]	NA	NA	NA	NA	NA	NA	15
Manganese	50 [c]	NA	NA	50	100	NA	NA	50
Mercury	2	0.05	0.051	NA	NA	NA	NA	0.05
Molybdenum	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	100	610	4600	610	4600	NA	NA	100
Selenium	50	NA	NA	170	4200	NA	NA	50
Silver	100 [c]	NA	NA	NA	NA	NA	NA	100
Thallium	2	1.7	6.3	0.24	0.47	NA	NA	1.7
Vanadium	50 [e]	NA	NA	NA	NA	NA	NA	50
Zinc	5000 [c]	NA	NA	7400	26000	NA	NA	5000

Notes:
Values in units of micrograms per liter (µg/L).

a. The selection of surface water criteria is the lowest value of either the maximum contaminant level (MCL), or the California Toxic Rule (CTR) Criteria. If a CTR criteria doesn't exist, the chosen critieria is the lower of either the MCL or the National Ambient Water Quality Criteria (NAWQC). This hierarchy places preference on regulatory criteria (MCLs or CTR criteria) over recommended criteria (NAWQC).

b. For arsenic, although the NAWQC based on drinking water source is the lowest value, this value is not chosen because as indicated in the U.S. Environmental Protection Agency (USEPA) CTR, the USEPA is specifically not promulgating human health criteria for arsenic due to uncertainties associated with the health effects of arsenic.

c. California Secondary MCL provided when Primary MCL not promulgated.

d. California Action Level for lead provided in CCR Title 22, Division 4, Chapter 17.5, Article 3, Section 64678.

e. California Department of Public Health Drinking Water Notification Level provided when neither California Primary or Secondary MCL are promulgated.

NA = Not applicable or not available.
T = Total Recoverable.

Sources:

USEPA. 2000. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR 131. U.S. Environmental Protection Agency. May. Available at: http://www.epa.gov/waterscience/standards/ctr/toxic.pdf

USEPA. 2002. National Recommended Water Quality Criteria. EPA 822-R-02-047. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. November. Available at: http://www.epa.gov/waterscience/criteria/wqcriteria.html

Table 7-1
Ecological Surface Water Screening Values
PG&E Topock
Needles, California
Human Health and Ecological Risk Assessment Work Plan

Analytes	CTR Criteria (µg/L)	NAWQC Freshwater CCC (µg/L)	Tier II SCV (µg/L)	Chosen Criteria (µg/L)	Hardness Adjusted Criteria (µg/L)	Source	Comments
Antimony	NA	NA	30	30	NA	Tier II SCV	USEPA (1988) FCV as cited in Suter and Tsao (1996).
Arsenic	150	150	3.1	150	NA	CTR/NAWQC	
Barium	NA	NA	4.0	4.0	NA	Tier II SCV	
Beryllium	NA	NA	0.66	0.66	NA	Tier II SCV	
Cadmium	2.2	0.25	NR	2.2	5.0	CTR	Adjusted for hardness of 300 mg/L.
Chromium, hexavalent	11	11	NR	11	NA	CTR/NAWQC	
Chromium, total dissolved[a]	180	74	NR	180	438	CTR	Adjusted for hardness of 300 mg/L.
Cobalt	NA	NA	23	23	NA	Tier II SCV	
Copper	9.0	9.0	NR	9.0	23	CTR/NAWQC	Adjusted for hardness of 300 mg/L. Also, when concentration of dissolved organic carbon is elevated, copper is substantially less toxic and use of Water-Effect Ratios might be appropriate (USEPA, 2002).
Lead	2.5	2.5	NR	2.5	8	CTR/NAWQC	Adjusted for hardness of 300 mg/L. USEPA is actively working on this criteria and so this recommended water quality criteria may change substantially in the near future (USEPA, 2002).
Manganese	NA	NA	120	120	NA	Tier II SCV	
Mercury	NA	0.77	1.30	0.77	NA	NAWQC	
Molybdenum	NA	NA	370	370	NA	Tier II SCV	
Nickel	52	52	NR	52	132	CTR/NAWQC	Adjusted for hardness of 300 mg/L.
Selenium	5.0	5.0	NA	5.0	NA	CTR/NAWQC	
Silver	NA	NA	0.36	0.36	NA	Tier II SCV	The SCV was estimated from the FAV and acute-chronic ratios for three species.

Table 7-1
Ecological Surface Water Screening Values
PG&E Topock
Needles, California
Human Health and Ecological Risk Assessment Work Plan

Analytes	CTR Criteria (µg/L)	NAWQC Freshwater CCC (µg/L)	Tier II SCV (µg/L)	Chosen Criteria (µg/L)	Hardness Adjusted Criteria (µg/L)	Source	Comments
Thallium	NA	NA	12	12	NA	Tier II SCV	
Vanadium	NA	NA	20	20	NA	Tier II SCV	
Zinc	120	120	NR	120	300	CTR/NAWQC	Adjusted for hardness of 300 mg/L.

Notes:

The screening levels were selected from available water quality criteria using the following order of preference: CTR freshwater CCC, NAWQC freshwater CCC, Tier II SCVs. Tier II values were developed so that benchmarks could be established with fewer data than required for the NAWQC. Tier II values were obtained from Suter and Tsao (1996).

a. A total chromium value was not available, therefore the NAWQC value for trivalent chromium was used.

CCC = Criterion Continuous Concentration; highest concentration in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect.
CTR = California Toxics Rule
FAV = Final Acute Value
FCV = Final Chronic Value
NA = not available
NR = Not required and not calculated in the source document; NAWQC Freshwater CCC are available.
SCV = Secondary Chronic Value; derived by dividing the secondary acute value by the secondary acute-chronic ratio.
µg/L = microgram(s) per liter
USEPA = U.S. Environmental Protection Agency

Sources:

USEPA. 1988. Ambient Water Quality Criteria for Antimony (III). Draft. August. U.S. Environmental Protection Agency. As cited in Suter and Tsao, 1996.

USEPA. 2000. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR 131. May. U.S. Environmental Protection Agency. Available at: http://www.epa.gov/waterscience/standards/ctr/toxic.pdf

USEPA. 2002. National Recommended Water Quality Criteria. EPA 822-R-02-047. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. November. Available at: http://www.epa.gov/waterscience/criteria/wqcriteria.html

Suter, G.W. , II, and C.L. Tsao. 1996. Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision. Oak Ridge National Laboratory, Oak Ridge, TN. 104pp. ES/ER/TM-96/R2

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Appendix I

Supplemental Ecological Risk Evaluation to Address HERD Comments Dated March 26, 2009; June 17, 2009; and September 10, 2009

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Appendix I – Supplemental Ecological Risk Evaluation to Address HERD Comments dated March 26, 2009; June 17, 2009; and September 10, 2009

HERA of Groundwater Impacted by Activities at
SWMU 1/AOC 1 and SWMU 2
Topock Compressor Station, Needles, California

November 2009

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Acronyms and Abbreviations

APE	Area of Potential Effect
BCW	Bat Cave Wash
bgs	below ground surface
COPC	constituent of potential concern
CSM	conceptual site model
DTSC	Department of Toxic Substances Conrol
ERA	ecological risk assessment
GWRA	Groundwater Risk Assessment
HERD	Human and Ecological Risk Division
LOAEC	lowest observable adverse effects concentration
mg/kg	milligrams per kilogram
mg/L	milligram(s) per liter
NOAEC	no-observable adverse effect concentration
PG&E	Pacific Gas and Electric
ppm	part(s) per million
RFI/RI	Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation
RTC	response to comment
site	Topock Compressor Station in Needles, California
UTL	Upper Tolerance Limits

Appendix I

Supplemental Ecological Risk Assessment to Address Regulatory Agency Comments

1. Introduction

This appendix was prepared in response to the March 26, 2009; June 17, 2009; and September 10, 2009; comments provided by the Human and Ecological Risk Division (HERD) (California Department of Toxic Substances Control [DTSC], 2009a,b,c) on the Pacific Gas and Electric (PG&E) Response to Comments (RTCs) for the Draft Groundwater Human Health and Ecological Risk Assessment (GWRA) for Topock Compressor Station in Needles, California (the site) (ARCADIS, 2009).

A detailed description of the transport mechanisms and exposure pathways is presented in Section 5 of the GWRA main text. Consistent with the approved Risk Assessment Work Plan (ARCADIS, 2008), the focus of the ecological risk assessment (ERA) in the main text of the GWRA was on evaluating the potential transport pathway to the Colorado River. In response to agency comments on the GWRA and on the RTCs, PG&E has expanded the GWRA via this appendix to include three additional potential exposure pathways for ecological receptors. These potential pathways are:

- Shallow-rooted wetland plant exposure to chemicals in groundwater via root uptake.

- Deep-rooted phreatophyte exposure to chemicals in first encountered groundwater via root uptake. Phreatophytes identified at the site are presented in Table I-1.

- Transfer of hexavalent chromium, nitrate, molybdenum, and selenium in groundwater to plant foliage via root uptake and translocation, then potential ingestion of hexavalent chromium, nitrate, molybdenum, and selenium in plant tissue by herbivorous mammals. Of particular interest to DTSC, was potential exposure of ruminants, specifically the desert bighorn sheep (*Ovis canadensis nelsoni*), to nitrate accumulated in phreatophyte tissue.

Groundwater from two exposure areas was evaluated due to the difference in chemical concentrations as discussed below in Section 2. The two exposure areas were groundwater underlying phreatophytes and shallow-rooted plants in: 1) the east side of the National Trails Highway, and 2) Bat Cave Wash (BCW). The remainder of this appendix discusses each of the potential exposure pathways listed above.

2. Conceptual Site Model

The conceptual site model (CSM) is presented in Figure 5-1 of the GWRA report. The primary chemical source is discharge of untreated wastewater to BCW. For the potential pathways listed in Section 1, only wells with beginning screened intervals shallower than 80 feet below ground surface (bgs) in both exposure areas (i.e., the east side of the National Trails Highway and BCW) were considered; wells where groundwater occurred deeper, or that were located outside the occurrence of phreatophytes, were not included. Wells with beginning screened intervals deeper than 80 feet were considered beyond depths of interest for potential phreatophyte exposure based on the root depths shown in Table I-1. Wells included in the assessment and corresponding depths to water are presented in Figure I-1.

The following describes the components of the CSM as it relates to the potential pathways listed above in Section 1.

2.1 Chemicals of Potential Concern

The focus of this assessment was on constituents of potential concern (COPCs) from the Revised Final Resource Conservation and Recovery Act Facility Investigation/Remedial Investigation (RFI/RI) Volume 2 (CH2M HILL, 2009), consisting of hexavalent chromium, molybdenum, nitrate, and selenium.

2.2 Background Screening

The dataset for the background screening consisted of maximum detected concentrations from January 2006 through July 2008 from wells shown on Figure I-1. These wells are shallow groundwater wells potentially co-located or nearest where phreatophytes or wetland plants occur in the Area of Potential Effect (APE) (Figure I-1). Maximum detected concentrations from these wells were compared with background Upper Tolerance Limits (UTLs) (Table I-2). Background UTLs are discussed in the main report (Section 3). If the maximum detected concentration of a COPC (i.e., hexavalent chromium, molybdenum, nitrate, and selenium) was greater than or equal to the background UTL for that COPC, the COPC was retained for further evaluation.

Figure I-2 presents the maximum detected concentrations in shallow wells co-located with phreatophytes along the east side of National Trails Highway. These wells are MW-21, MW-22, MW-27-20, MW-28-25, MW-29, MW-30-30, MW-32-20, MW-33-40, MW-35-60, MW-36-20, MW-39-40, MW-42-30, MW-43-25, MW-47-55, MW-56S,

PT-1S, PT-2S, PT-3S, PT-4S, PT-5S, PT-6S, and PTI-1S. Table I-2 presents the comparison of the maximum detected concentrations of each of the four COPCs to corresponding background UTLs. The maximum detected concentrations in selected wells on the east side of National Trails Highway exceed background UTLs for three COPCs (hexavalent chromium, molybdenum, and selenium). The results of the background comparison are summarized in Table I-2.

Figure I-2 presents the maximum detected concentrations in wells co-located with phreatophytes at BCW (see wells MW-41S, MW-13, and MW-11). Table I-2 presents the comparison of the maximum detected concentrations of each of the four COPCs to corresponding background UTLs. The maximum detected concentrations are based on recent groundwater samples collected from January 2006 to July 2008. The maximum detected concentrations in selected wells in BCW exceed background UTLs for two COPCs; these are hexavalent chromium and selenium. The maximum detected concentration of molybdenum in BCW wells did not exceed the background UTL. The results of the background comparison are summarized in Table I-2.

Based on comparison with background UTLs for groundwater, hexavalent chromium, molybdenum, nitrate, and selenium each had maximum detected concentrations that exceeded background along the east side of National Trails Highway and/or BCW and, therefore, were retained for further evaluation as COPCs in shallow groundwater that may be contacted by shallow-rooted plants as well as taken up by phreatophytes. However, it should be noted that only hexavalent chromium exceeded background in both exposure areas (Table I-2), reducing the potential for exposure via plant uptake for the other COPCs (nitrate, molybdenum, and selenium) because of the relatively small area with concentrations exceeding background that underlies phreatophytic or wetland/marsh plants.

3. Exposure Assessment

Groundwater level data for water table wells were obtained from Appendix B of the Revised Final RFI/RI Volume 2 (CH2M HILL, 2009) and Appendix B of the *Monitoring Report for the Floodplain Reductive Zone In-Situ Pilot Test* (ARCADIS, 2007). Figure I-1 displays the depth-to-water data for water table wells. As mentioned earlier, only wells with beginning screened interval shallower than 80 feet bgs were considered in this assessment; wells with deeper screened intervals were considered to be monitoring groundwater beyond depths of interest for phreatophyte exposure (see below for discussion of root depths). Depths to groundwater are as shallow as approximately 4 feet bgs near the river. Well-screened intervals and, therefore, depth of groundwater monitored, as well as an understanding of plant root depths, form the basis of the exposure evaluation for plants. Exposure of plants via root uptake from groundwater and subsequent translocation of COPCs from roots to foliage must occur for exposure of herbivorous mammals, including desert bighorn sheep, to nitrate, hexavalent chromium, molybdenum, and selenium originating in groundwater.

The following sections describe the potential exposure pathways for shallow-rooted wetland plants, deep-rooted phreatophytic plants, and herbivore ingestion of plant tissue.

3.1 Shallow-Rooted Wetland Vegetation

The potential exposure pathway for shallow-rooted wetland plants was evaluated qualitatively by reviewing well-screened intervals to select wells with monitoring results representative of potential exposure, reviewing depth-to-water data, considering geochemical processes that operate in wetland environments, and reviewing COPC concentrations in groundwater. Historical depth-to-water measurements suggest that shallow groundwater may not discharge at wetland areas (Figure I-1). Shallow-rooted plants such as common reed (*Phragmites communis*), cattails (*Typha sp.*), sedges (*Carex sp.*), and bulrush (*Scirpus sp.*) may not contact groundwater given that the shallowest depth to water measured near the river is approximately 4 feet (CH2M HILL, 2009), and these plants have ready access to surface water from the river. Deeper rooted plants, such as salt cedar and arrow weed, present immediately adjacent to the river or ponded water at the mouth of BCW, also have ready access to the surface water and, therefore, surface water would be the primary source of moisture for these plants rather than groundwater. As shown on Figure I-2, wetland/marsh plants (denoted in green) lie outside the plume line defined by the background UTL for hexavalent chromium in shallow groundwater.

3.2 Deep-Rooted Phreatophytic Vegetation

The exposure pathway for deeper rooted phreatophytes was evaluated quantitatively. The following describes the types of phreatophytes present at the site and their average rooting depths obtained from various literature sources.

Potential exposure to COPCs (hexavalent chromium, nitrate, selenium, and molybdenum) depends on depth to groundwater, root depths, and chemical distribution in the groundwater. Shallow groundwater wells that best represent COPC concentrations potentially contacting phreatophytic vegetation (Figure I-2) were selected based on the following criteria:

- Concentrations detected in wells with beginning screened intervals shallower than 80 feet bgs
- Co-location with phreatophytic vegetation
- Nearest upgradient well

MW-11 and MW-21 were the only wells selected that are not co-located with phreatophytic vegetation. MW-11 is the nearest upgradient well of phreatophytes at BCW. MW-21 is also very near phreatophytic vegetation.

The potential exposure pathway for phreatophytes was evaluated quantitatively by first assessing the potential for root contact with chemically affected groundwater, then considering groundwater concentrations of COPCs where contact may occur. Table I-1 provides maximum root depths for phreatophytes identified at the site showing that some species, such as honey mesquite (*Prosopis glandulosa*) can have roots up to 50 feet deep. Depths to groundwater in the BCW and on the east side of National Trails Highway where phreatophytes occur range from 30 feet bgs to 4 feet bgs. Deep-rooted phreatophytic upland plants may contact COPCs occurring in shallow groundwater. Such phreatophytes include mesquite (*Prosopis* spp.), palo verde (*Cercidium sp.*), salt cedar (*Tamarix ramosissima Ledeb.*), arrowweed (*Pluchea sericea*), and catclaw acacia, *(Acacia greggii*), which occur within upland areas near the river and in BCW where depths to water are also within potential root zones (Figure I-1). Consistent with this information, mesquite and palo verde grow in the BCW in areas with water table depths up to 50 feet bgs (Figure I-1 of this appendix and Figure 5-3 in CH2M HILL, 2009). The shallower rooted salt cedar (*Tamarix ramosissima Ledeb*.) is found where the depth to groundwater is 4 to 32 feet bgs (or where there is surface water) (Figure I-

1), which is consistent with its reported maximum rooting depths of about 25 feet (Table I-1). Therefore, it is indicated that phreatophytes may contact groundwater in the APE, and that the concentrations of COPCs in groundwater underlying the phreatophytes are of interest. These concentrations are further evaluated in Section 4.

3.3 Herbivorous Mammal Ingestion of Plant Tissue

Given that phreatophytic vegetation may contact groundwater in the APE, ingestion of chemicals in plant tissue is a potential exposure pathway to other ecological receptors. In particular, transfer of COPCs in groundwater to plant foliage via root uptake and translocation, then potential ingestion of COPCs in plant tissue by herbivorous mammals, particularly ruminants is a potential pathway of interest given:

- The presence of desert bighorn sheep in the area
- The presence of herbivorous mammals (as represented by the Merriam's kangaroo rat)
- Potential for toxicity in ruminants and other herbivorous mammals resulting from exposure to hexavalent chromium, molybdenum, and selenium, as well as nitrate in forage
- Specifically, known potential for nitrate toxicity in ruminants resulting from exposure to nitrate in feed.

Desert bighorn sheep are a federally listed sensitive species. This species is primarily associated with rugged terrain and mountainous areas but uses a variety of habitat types including desert riparian and desert scrub (Hopkins, as included in the California Wildlife Habitat Relationships System, 2009). The occurrence of this species included in the California Natural Diversity Database (CNDDB, 2009) is shown on Figure I-3. The nearest occurrence of the desert bighorn sheep to the site according to the CNDDB is in the Chemehuevi Mountains. However, desert bighorn sheep have been observed by Topock Compressor Station personnel and are a transient and infrequent visitor to the area around the APE (Russell, pers. comm. 2009). Available information indicates that the desert bighorn sheep are infrequently present and, therefore, infrequently feed on plants within the APE, but outside the area of desert bighorn sheep occurrence that is shown on Figure I-3.

The diet of the desert bighorn sheep is varied and has been reported to contain 50 percent browse with the remainder of the diet comprised of forbs, grasses, and succulents (Brewer and Harveson, 2007). In the APE, browse would include phreatophytes. Therefore, the diet composition likely further reduces the potential for exposure to COPCs in plant tissue accumulated from groundwater.

For herbivorous mammals including ruminants, plant tissue concentrations of nitrate were evaluated qualitatively based on the maximum nitrate concentration observed in shallow groundwater within the area where phreatophytes occur in the APE (Figure I-2).

Maximum nitrate concentrations between January 2006 and July 2008 exceeded background in one well of 25 wells (analyzed in 24 wells) selected to represent potential phreatophyte exposure (16.4 milligrams per liter [mg/L] in MW-11; Figure I-2). A study by McKeon et al. (2006) of nitrate uptake patterns over a nitrate-contaminated aquifer in northeast Arizona, showed that phreatophyte tissue concentrations did not exceed safe levels (see Section 4) for ruminants even when the plants were growing in the on-plume area. The phreatophyte, *Atriplex canescens*, growing over a shallow groundwater plume with high concentrations of nitrate (up to 1210 mg/L) accumulated a maximum average nitrate concentration of 727 milligrams per kilogram [mg/kg] nitrate-N in leaf tissue (plants harvested in 2000). Later analyses yielded an average nitrate concentration of 108 mg/kg nitrate-N in leaf tissue on the plume (estimated based on Figure 5 of the McKeon et al. (2006) study; plants harvested in July 2002). The on-plume area sampled was the most heavily contaminated part of the plume, presumably around the greater than 1000 mg/L contour for nitrate-N (Figure 1 of the McKeon et al. [2006] study).

The maximum nitrate-N concentration of 16.4 mg/L at Topock is well below the on-plume groundwater concentrations reported in the McKeon et al (2006) study (maximum was 1210 mg/L). Further, maximum concentrations from other wells selected to represent potential phreatophyte exposure did not exceed the background UTL. As a result, plant tissue concentrations at Topock are expected to be well below the maximum average concentrations detected in leaf tissue (951 mg/kg dry-weight for *Sarcobatus vermiculatus* and 727 mg/kg dry-weight for *A. canescens*) in the McKeon et.al. (2006) study. The reported nitrate-N concentrations in groundwater at the McKeon et.al. (2006) study site ranged from 12 to 1210 mg/L. The reported average leaf tissue nitrate-N concentrations ranged from 20 to 951 mg/kg dry-weight.

Similarly, for herbivorous mammals including ruminants, plant tissue concentrations of hexavalent chromium were evaluated qualitatively. In a study by Sorenson et al. (2009), uptake of hexavalent chromium from water to saltcedar (*Tamarix ramsissima*) was evaluated. In this study, 6-week-old saltcedar plants were placed in treatment solution containing tapwater (0.0007 mg/L) for control plants and tapwater with chromium (2 mg/L) trioxide, and results were reported as concentrations of elemental chromium. The concentration of chromium in plants grown in 2 mg/L of chromium in treatment solution contained an average of 1.89 mg/kg chromium. The accumulation factor based on this study is approximately 0.95 (i.e., concentration in plant tissue divided by the concentration in water).

The maximum hexavalent chromium concentration observed in shallow groundwater within the area where phreatophytes occur in the APE (Figure I-2), is 0.356 mg/L from MW-11 in BCW (Table I-2), which is similar to the chromium treatment solution in the study by Sorenson et al., (2009) and, therefore, the uptake at the Topock site can be conservatively assumed to be similar. Based on the uptake factor of 0.95, the maximum concentration of chromium in plants at the Topock site resulting from exposure to hexavalent chromium in groundwater is estimated to be 0.338 mg/kg. It should be noted that chromium in plants occurs primarily in the trivalent form (Eisler,1986; Aldrich et. al., 2003; Ramachandran, 1980).

Maximum selenium concentrations between January 2006 and July 2008 exceeded background in only one well of 25 wells selected to represent potential phreatophyte exposure (see MW-21 on Figure I-2). The single exceedance (0.038 mg/L in Well MW-21) only slightly exceeds the background of 0.0103 mg/L (Table I-2). Based on this observation, it can be assumed that uptake of selenium by plants from groundwater and exposure to herbivorous mammals is not a significant pathway and, therefore, does not require further evaluation.

Maximum molybdenum concentrations between January 2006 and July 2008 exceeded background in two wells of 25 wells (analyzed in 8 wells) selected to represent potential phreatophyte exposure (MW-22 with a concentration of 0.0482 mg/L and MW-21 with a concentration of 0.052 mg/L; Figure I-2). These two concentrations slightly exceed the background UTL (0.0363 mg/L) in a localized area. Based on this observation, it can be assumed that uptake of molybdenum by plants from groundwater and exposure to herbivorous mammals is not a significant pathway and, therefore, does not require further evaluation.

To summarize, given the concentrations of COPCs in groundwater underlying shallow-rooted and phreatophytic vegetation, potential exposure of ecological receptors to COPCs originating in groundwater is anticipated to be minimal. To satisfy DTSC's request for additional support for this conclusion, uptake of concentrations of hexavalent chromium and nitrate from groundwater to plants and then ingestion of plants by herbivorous mammals is further evaluated in the following section. Uptake of selenium and molybdenum from groundwater to plants and then ingestion of plants by herbivorous mammals is not considered a significant pathway and is not further evaluated.

4. Toxicity Assessment

A no-observable adverse effect concentration (NOAEC) was selected for each chemical to evaluate the toxicity of COPCs to plants. Table I-3 presents the NOAECs selected for this assessment. The following describes the plant toxicity values for hexavalent chromium, molybdenum, selenium and nitrate. Potential toxicity of hexavalent chromium and nitrate to herbivorous mammals including ruminants from ingestion of plant tissue containing these COPCs is also described.

4.1 Hexavalent Chromium

A NOAEC of 2 mg/L for hexavalent chromium was reported in Sorenson et al. (2009) for salt cedar. Mesquite (*Prosopis spp.*) tolerates hexavalent chromium in solutions of up to 125 mg/L when grown in agar and 80 mg/L when grown hydroponically (Aldrich et al., 2003) indicating a hexavalent chromium NOAEC for mesquite of 80 mg/L (Table I-3).

The USEPA (2008) reports that chromium has been shown to be an essential nutrient for animals. Trivalent chromium has been shown to have antioxidative properties in vivo, and it is integral to activating enzymes and maintaining the stability of proteins and nucleic acids. Its primary metabolic role is to potentiate the action of insulin through its presence in an organometallic molecule called the glucose tolerance factor. For example, studies with guinea pigs fed trivalent chromium for 21 weeks at concentrations up to 50 parts per million dietary trivalent chromium showed no adverse effects (Preston et al. 1976; as cited in Eisler, 1986).

4.2 Nitrate

Plants: An NOAEC of 1210 mg/L for nitrate was reported in McKeon et al. (2006) for fourwing saltbush and black greasewood (Table I-3).

Because desert plant communities are typically limited by nitrogen during growing periods (Zak and Whitford, 1988), nitrate uptake from the groundwater is expected to have beneficial rather than adverse effects on the plants. For example, in a desert system in Arizona the phreatophyte, *Atriplex canescens*, growing over a shallow groundwater plume with high concentrations of nitrate (maximum nitrate-N concentration = 300 mg/L), accumulated 5 times more nitrate in its leaves during summer than plants growing off the plume (up to 500 mg/kg nitrate-N in leaf tissue; McKeon et al., 2006). The study estimated that at the McKeon site, 40 kg of plume

water would supply sufficient nitrogen for production of 1 kg of plant biomass. Isotope analysis indicated most of the nitrate came from the groundwater plume. The increased nitrate in the plant tissues produced no phytotoxicity (McKeon et al., 2006).

Mammals: Under normal conditions, nitrate is converted to nitrite by microorganisms in ruminants (such as sheep and cattle), which is then converted to ammonia and on to proteins and other compounds. Nitrate can be toxic to animals if the rate of conversion of nitrate to nitrite is greater than the conversion of nitrite to ammonia, resulting in a buildup of nitrite in the animal (A&L Great Lakes Laboratories, 2002). Various factors can affect the nitrite accumulation including the plant species, section of the plant (e.g., stalks are higher in nitrate content), plant age, and weather conditions (conditions that reduce plant growth increase nitrate production). A&L Great Lakes Laboratories (2002) provide safety guidelines for nitrate in ruminant feed and 4,400 ppm dry weight is listed as a safe level to feed under all conditions. Further, using a generalized interpretation for laboratory forage nitrate tests, 0 to 3,000 parts per million (ppm dry weight) in feed is considered safe for all cattle; 3,000 to 5,000 ppm (dry weight) in feed is considered safe for non-pregnant beef cattle; 5,000 to 10,000 ppm (dry weight) in feed is a small risk for some cattle; and greater than 10,000 ppm (dry weight) in feed is considered toxic for all cattle (Denman et al., undated).

5. Risk Characterization

The following describes the risk characterization for the exposure pathways evaluated above.

5.1 Shallow-Rooted Vegetation

As HERD stated (DTSC, 2009a), sampling has not demonstrated movement of the groundwater plume with COPCs into the Colorado River (see Figure I-2). Hexavalent chromium was not detected in shallow wells nearest the river (MW-28-25, MW-29, and MW-27-20; Figure I-2). Further, the reducing conditions in wetland areas would result in precipitation of hexavalent chromium, selenium, and molybdenum binding the metals to soil/sediment particles and reducing bioavailability. Further, shallow-rooted vegetation in the riparian area has ready access to surface water as a source of moisture. The data suggest wetland/riparian plants along the river are unlikely to be impacted by COPCs from the groundwater. Therefore, this shallow-rooted wetland/riparian plant pathway is considered insignificant and will not be evaluated further.

5.2 Deep-Rooted Phreatophytic Vegetation and Risk to Ruminants from Nitrate in Plants

Hazard quotients were calculated for potential exposure of phreatophytes to COPCs in groundwater (Table I-4). All hazard quotients for phreatophytes were well below one indicating no significant risk of phytotoxicity.

The maximum nitrate-N concentration is 16.4 mg/L (at MW-11), much lower than the maximum concentration in the McKeon et. al. (2006) study (1210 mg/L). No phytotoxicity was reported in the McKeon et.al. (2006) study. Given that nitrate concentrations in groundwater at Topock were orders of magnitude lower than those observed at the McKeon et.al. (2006) study site, concentrations in leaf tissue at Topock are expected to be well below 951 mg/kg dry-weight, the maximum average nitrate-N concentration observed in the McKeon et.al. (2006) study.[1] Levels assumed to be safe in feed for ruminants are up to 3,000 mg/kg dry-weight [Denman et al., undated]. Therefore, toxicity due to nitrate would also not be predicted for ruminants. Further,

[1] Average leaf tissue nitrate-N concentrations ranged from approximately 20 mg/kg to 951 mg/kg dry-weight depending on the plant species, sampling event, and grazing pressure.

given the limited distribution of nitrate greater than background (see Section 3.3), toxicity due to nitrate would not be predicted for herbivorous small mammals.

The maximum hexavalent chromium concentration in the BCW (within or bounding the area occupied by phreatophytes) is below levels found to be toxic to phreatophytic plants such as salt cedar and mesquite (Table I-3). Hexavalent chromium concentrations in shallow groundwater in the upland east of National Trails Highway are many times lower than those observed in the BCW at MW-11; therefore, phytotoxicity due to hexavalent chromium would not be predicted in either area. The estimated maximum concentration of chromium in plant tissue (0.338 mg/kg) from uptake from groundwater is considered low. For example, studies with guinea pigs fed trivalent chromium for 21 weeks at concentrations up to 50 mg/kg dietary trivalent chromium showed no adverse effects (Preston et al. 1976; as cited in Eisler, 1986). This is as would be expected for trivalent chromium, an essential nutrient that is well-regulated in mammalian systems. Therefore, toxicity due to chromium would also not be predicted for herbivorous mammals or for ruminants.

As discussed in Section 3.3, the concentrations of selenium and molybdenum in groundwater are not considered significant and, therefore, toxicity would not be predicted for herbivorous mammals or for ruminants.

The maximum COPC concentrations in groundwater described above are not associated with phytotoxicity and, therefore, effects would not be predicted in the study area where phreatophytic vegetation is potentially exposed. Therefore, the exposure pathway from chemically affected groundwater to phreatophytes is insignificant because maximum concentrations in shallow groundwater underlying these plant communities are very low relative to concentrations known to be phytotoxic. Further, toxicity to herbivorous mammals resulting from potential exposure to COPCs is not predicted given the low concentrations in groundwater of molybdenum and selenium and the low concentrations of chromium and nitrate predicted in plant tissue.

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Tables

Figures

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Tables

Table I-1. Maximum Rooting Depths of Site-Specific Phreatophytes

Species of Phreatophyte	Maximum Root Depth (feet)	Reference
Honey Mesquite (*Prosopis glandulosa*)	49	Glenn and Nagler (2005), Alth et al. (1991)
Palo Verde (*Cercidium* sp.)	50	Deep roots, not as deep as mesquite, Barth and Klemmedson (1982), MW-21 well near pure Palo Verde has about 50' depth to groundwater
Tamarisk (*Tamarix* sp.) (esp. Salt Cedar)	25	Glenn and Nagler (2005), Shrader (1977)
Arrowweed (*Pluchea sericea*)	20	Alth et al. (1991)
Catclaw Acacia (*Acacia greggii*)	>18	Zimmerman (1969)

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Table I-2. Maximum Groundwater Concentrations in Wells Co-Located with or Near Phreatophytes

COPC	Background UTL (mg/L)	East of National Trails Highway[1]			Bat Cave Wash[2]			COPC for Further Evaluation?
		Maximum Concentration (mg/L)	Location of Maximum	Exceeds Background?	Maximum Concentration (mg/L)	Location of Maximum	Exceeds Background?	
Hexavalent Chromium	0.0318	0.0619	MW-47-55	YES	0.356	MW-11	YES	YES
Molybdenum	0.0363	0.052	MW-21	YES	0.00928	MW-11	NO	YES
Nitrate	5.03	3.7	PT-5S	NO	16.4	MW-11	YES	YES
Selenium	0.0103	0.038	MW-21	YES	0.00617	MW-11	NO	YES

Notes:
COPC = constituent of potential concern
mg/L = milligram(s) per liter
UTL = upper tolerance limit

Footnotes:
(1) Figure I-2 presents the maximum detected concentrations in shallow wells co-located with phreatophytes along the east side of National Trails Highway. These wells are MW-21, MW-22, MW-27-20, MW-28-25, MW-29, MW-30-30, MW-32-20, MW-33-40, MW-35-60, MW-36-20, MW-39-40, MW-42-30, MW-43-25, MW-47-55, MW-56S, PT-1S, PT-2S, PT-3S, PT-4S, PT-5S, PT-6S, and PTI-1S
(2) Figure I-2 presents the maximum detected concentrations in wells co-located with phreatophytes at BCW (see wells MW-41S, MW-13, and MW-11).

Table I-3. Groundwater No-Observed Adverse Effects Concentrations

COPC	Maximum Concentration (mg/L)[1]	NOAEC (mg/L)	Source
Hexavalent Chromium	0.356	2	salt cedar; Sorenson et al. 2009
		80	mesquite; Aldrich et al. 2003
Molybdenum	0.052	9.6 [2]	bush bean; Adriano, 2001
Nitrate	16.4	1210	fourwing saltbush and black greasewood; McKeon, 2006
Selenium	0.038	2	salt cedar; Sorenson et al. 2009

Notes:

COPC = Chemical of potential concern

LOAEC = lowest observed adverse effects concentration

mg/L = milligrams per liter

NOAEC = no observed adverse effects concentration

Footnotes:

(1) Maximum concentration for all monitoring wells from Figure I-2.

(2) Extrapolated from LOAEC to NOAEC assuming a factor of 10 reduction.

References:

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Table I-4. Hazard Quotients - Protection of Plant Health

COPC	Maximum Concentration (mg/L)[1]	NOAEC (mg/L)	Hazard Quotient
Hexavalent Chromium	0.356	2	0.2
		80	0.00
Molybdenum	0.052	9.6 [2]	0.01
Nitrate	16.4	1210	0.01
Selenium	0.038	2	0.02

Notes:
COPC = Chemical of potential concern
LOAEC = lowest observed adverse effects concentration
mg/L = milligrams per liter
NOAEC = no observed adverse effects concentration

Footnotes:
(1) Maximum concentration for all monitoring wells from Figure I-2.
(2) Extrapolated from LOAEC to NOAEC assuming a factor of 10 reduction.

Figures

Park Moabi

San Bernardino County (Managed by USBLM)

U.S. Bureau of Reclamation (Managed by USBLM)

PG&E

COLORADO RIVER

POND

TOPOCK MARSH

Havasu National Wildlife Refuge (Managed by USFWS)

National Trails Highway

BNSF RAILROAD

INTERSTATE 40

Topock Marina

Havasu National Wildlife Refuge (Managed by USFWS)

Topock Compressor Station

PG&E

U.S. Bureau of Land Management (Owned and Managed by USBLM)

Metropolitan Water District of Southern California

MW-35-60 27
MW-47-55 30
MW-29 29
MW-28-25 10
PT-1S 16[a]
PT-3S 16[a]
PT-4S 16[a]
PTI-1S 17[a]
MW-39-40 11
MW-36-20 14
MW-27-20 4
MW-33-40 32
MW-41S 23
MW-13 30
PT-6S 18[a]
PT-2S 16[a]
PT-5S 16[a]
MW-30-30 12
MW-42-30 9
MW-32-20 4
MW-43-25 10
MW-22 4
MW-56S 11[a]
MW-11 64
MW-21 52

0 1,000 2,000 Feet
GRAPHIC SCALE

LEGEND:

- Arrowweed
- Landscaped
- Mesquite
- Mesquite/Palo Verde
- Palo Verde
- Salt Bush
- Salt Cedar
- Salt Cedar/Mesquite
- Wetland/Marsh
- Developed Area
- Monitoring Wells
- Approximate 32 µg/L Hexvalent Chromium Contour in the Alluvial Aquiver (October 2007)
- Property Boundaries
- Area of Potential Effects

MW-16 — Well ID
199 — Depth to Groundwater (ft bgs)

NOTES:
1. Figure includes all active wells found in the Shallow Zone of the Alluvial Aquifer in which groundwater was encountered within 80 ft bgs. Well ID list from Table B-1 - Drilling and Well Construction Summary for the RFI/RI Characterization (Appendix B, RFI/RI Vol. 2, CH2HILL, 2008).
2. Approximate depth to groundwater calculated from data presented in Table B-1 - Drilling and Well Construction Summary for RFI/RI Characterization, Appendix B. RFI/RI Volume 2. (CH2MHILL, 2008)
3. Extent of vegetation communities from Figure 6 of the Programmatic Biological Assessment for Pacific Gas and Electric Topock Compressor Station Remedial and Investigative Actions report (CH2MHILL, 2007).

[a] Depth to water data from Appendix B of the May 2007 Monitoring Report for the Floodplain Reductive Zone In-Situ Pilot Test (ARCADIS, 2007).

ft bgs = feet below ground surface

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

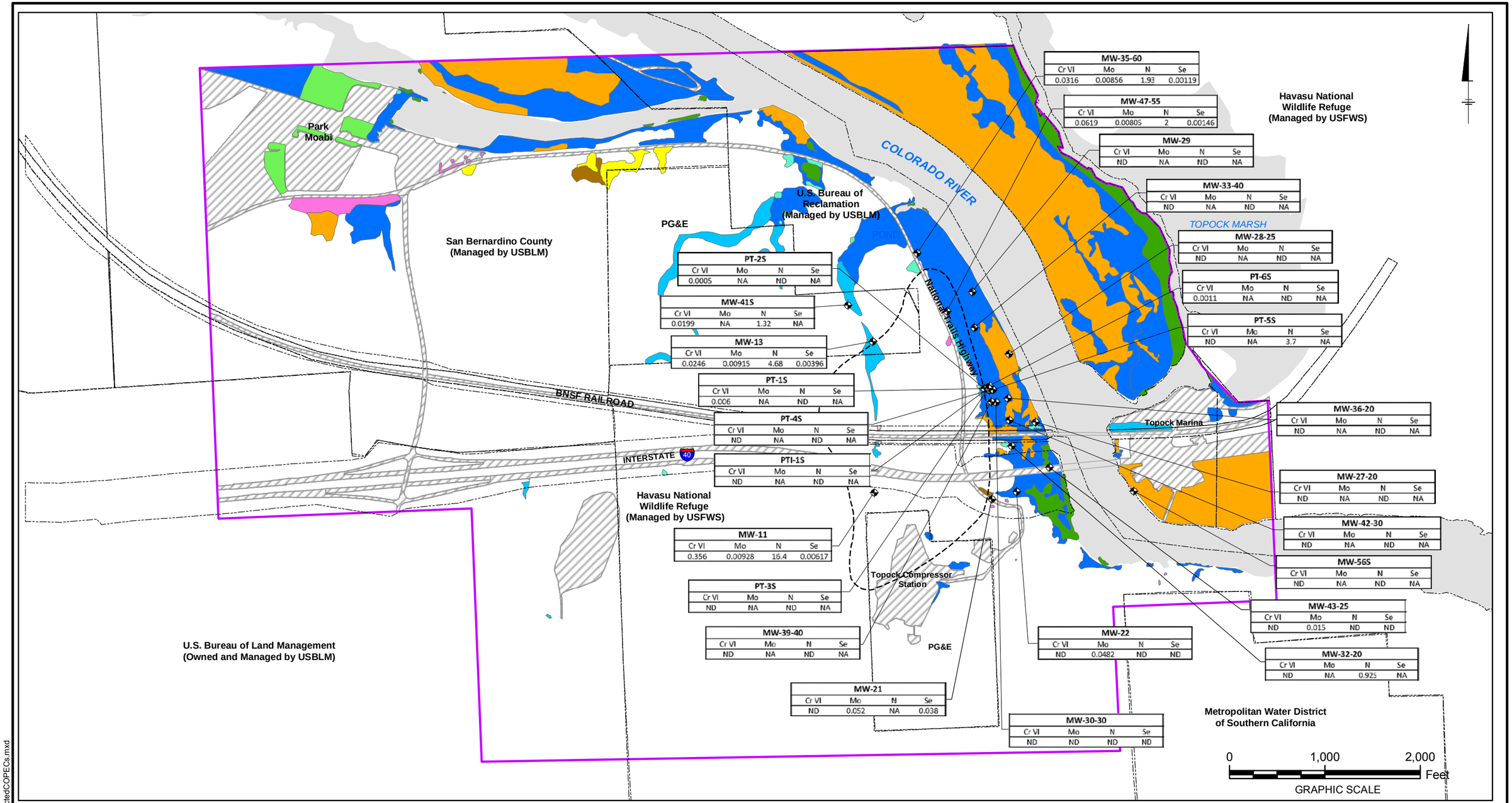
HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

DEPTH TO GROUNDWATER IN WATER TABLE WELLS AND VEGETATION OF INTEREST

ARCADIS

FIGURE
I-1

[WC-85 VJR] SANF-85 EGH
Project (RC000689.0002 Task 2)
Q:\PGE\Topock\GW_Risk\MXD\Fig I-1_Plume_Veg_Wells.mxd



LEGEND:

- Arrowweed
- Landscaped
- Mesquite
- Mesquite/Palo Verde
- Palo Verde
- Salt Bush
- Salt Cedar
- Salt Cedar/Mesquite
- Wetland/Marsh
- Developed Area
- Monitoring Wells
- Approximate 32 µg/L Hexvalent Chromium Contour in the Alluvial Aquiver (October 2007)
- Property Boundaries
- Area of Potential Effects

MW-11
Cr VI Mo N Se
0.356 0.00928 15.4 0.00617

Well ID

Maximum Detected Concentration (mg/L)

NOTES:

1. Figure includes active wells found in the Shallow Zone of the Alluvial Aquifer with an initial screened interval of 80 ft bgs and which occur in or within close proximity to phreatophyte or wetland vegetation.
2. All results presented are in mg/L.
3. Extent of vegetation from Figure 6 of the Programmatic Biological Assessment for Pacific Gas and Electric Topock Compressor Station Remedial and Investigative Actions report (CH2MHILL, 2007).
4. Maximum detected concentrations from groundwater samples collected from January 2006 through July 2008.
5. Nitrate (N) was analyzed with three methods. The maximum of nitrate as nitrogen, nitrite as nitrogen, and converted from NO3 is presented.

ft bgs = feet below ground surface
mg/L = milligrams per liter
NA = Not Analyzed
ND = Non Detect

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

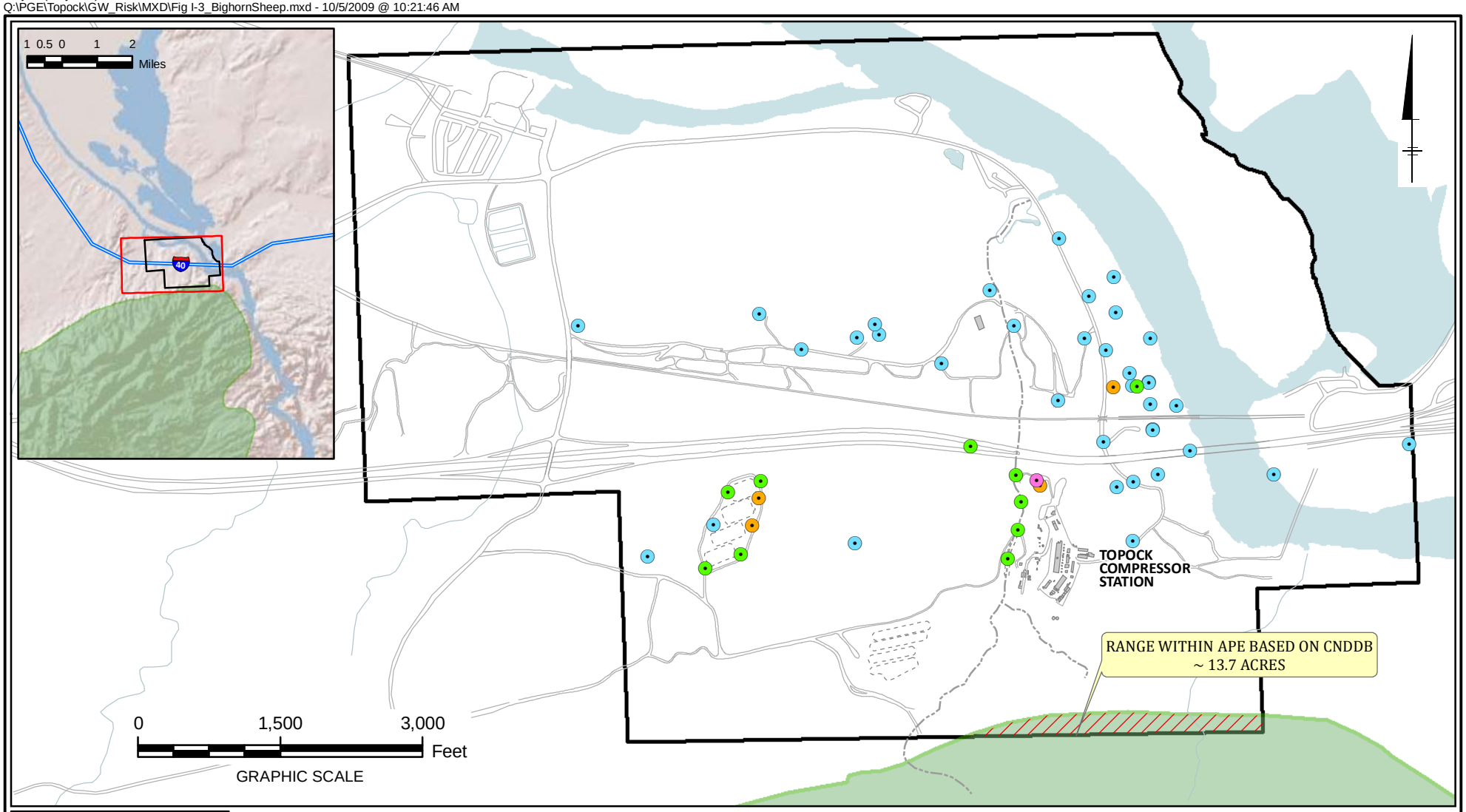
MAXIMUM COPC CONCENTRATIONS IN WATER TABLE WELLS AND VEGETATION OF INTEREST

ARCADIS

FIGURE
I-2

[MC-85 VJR] SANF-85 EGH
Project (RC000689.0002 Task 2)
Q:\PGE\Topock\GW_Risk\MXD\Fig I-2_MaxDetectedCOPECs.mxd

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGE\Topock\GW_Risk\MXD\Fig I-3_BighornSheep.mxd - 10/5/2009 @ 10:21:46 AM



LEGEND:

DISSOLVED NITRATE CONCENTRATIONS IN SHALLOW AQUIFER
- <5.03 mg/L (or ND)
- 5.03 - 10 mg/L
- 10.1 - 19.9 mg/L
- >20 mg/L

NELSON'S BIGHORN SHEEP (*O. CANADENSIS NELSONI*) OCCURRENCE

AREA OF POTENTIAL EFFECTS

BUILDINGS

NOTES:
HOME RANGE DATA OBTAINED FROM THE CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDB, CALIFORNIA DEPARTMENT OF FISH & GAME)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES CALIFORNIA

HERA OF GROUNDWATER IMPACTED BY ACTIVITIES AT SWMU 1/AOC 1 AND SWMU 2

NELSON'S BIGHORN SHEEP OCCURRENCE AND NITRATE IN SHALLOW GROUNDWATER

ARCADIS

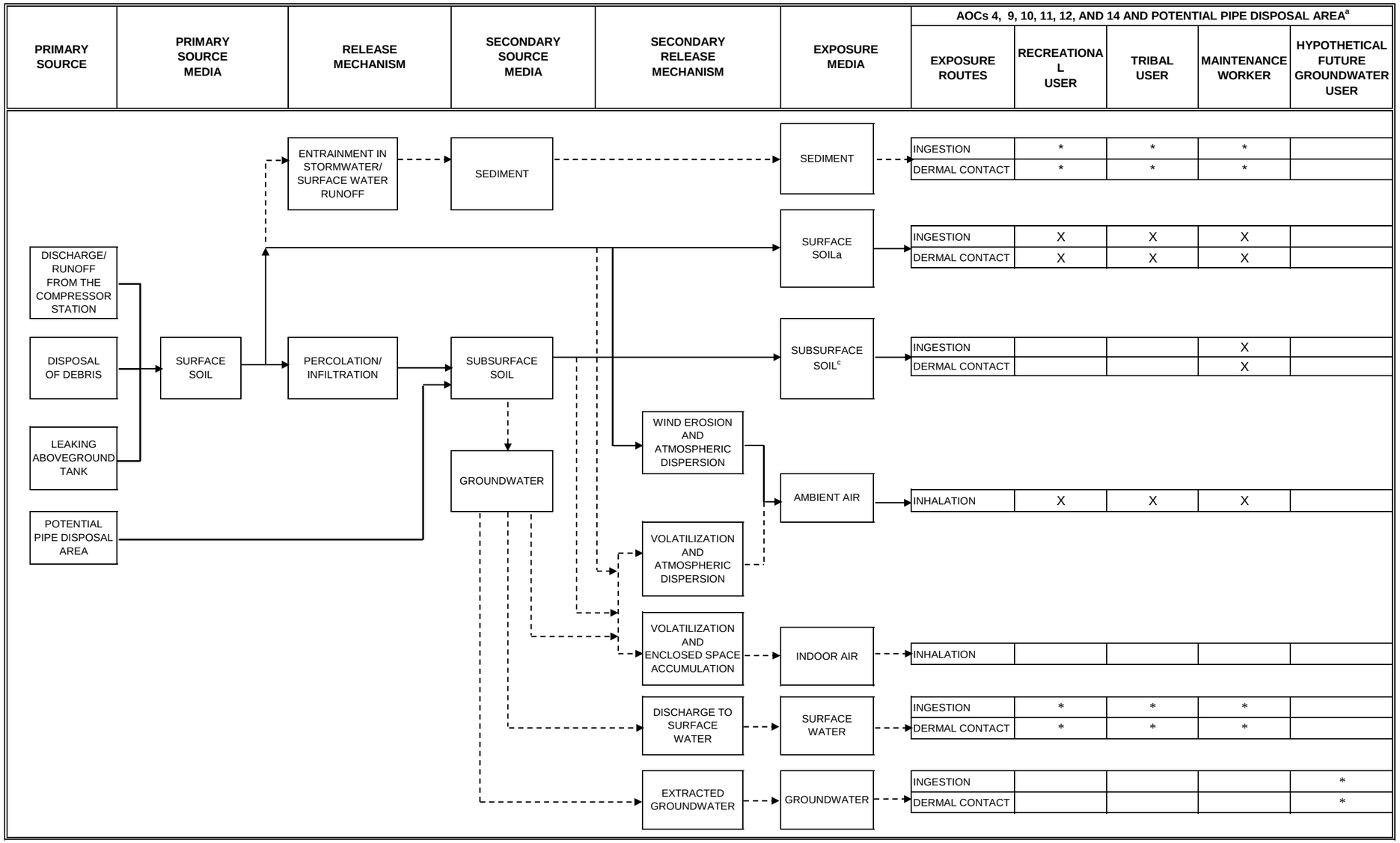
FIGURE
I-3

ARCADIS

Appendix J

Conceptual Site Models
(Figures 4-2 and 4-3 from RAWP
[ARCADIS, 2008])

FIGURE 4-2
PRELIMINARY HUMAN HEALTH CSM FOR AOCS 4, 9, 10, 11, 12, 14, and POTENTIAL PIPELINE DISPOSAL AREA (OUTSIDE THE COMPRESSOR STATION) [a]
PACIFIC GAS AND ELECTRIC COMPANY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT WORK PLAN



NOTES:

[a] The Former 300B Pipeline Liquids Tank Area outside the compressor station has already been closed (CH2MHILL, 2007i), but DTSC has requested additional investigation (CalEPA, 2007d). If complete pathways are identified based on the results, the Former 300B Pipeline Liquids Tank Area will also be included in the HHRA.

[b] Defined as soils collected at depths between 0 and 3 feet below ground surface (bgs). A subset of this depth interval is near surface soil collected from 0 to 0.5 feet bgs.

[c] Defined as soils collected at depths between 3 and 10 feet bgs.

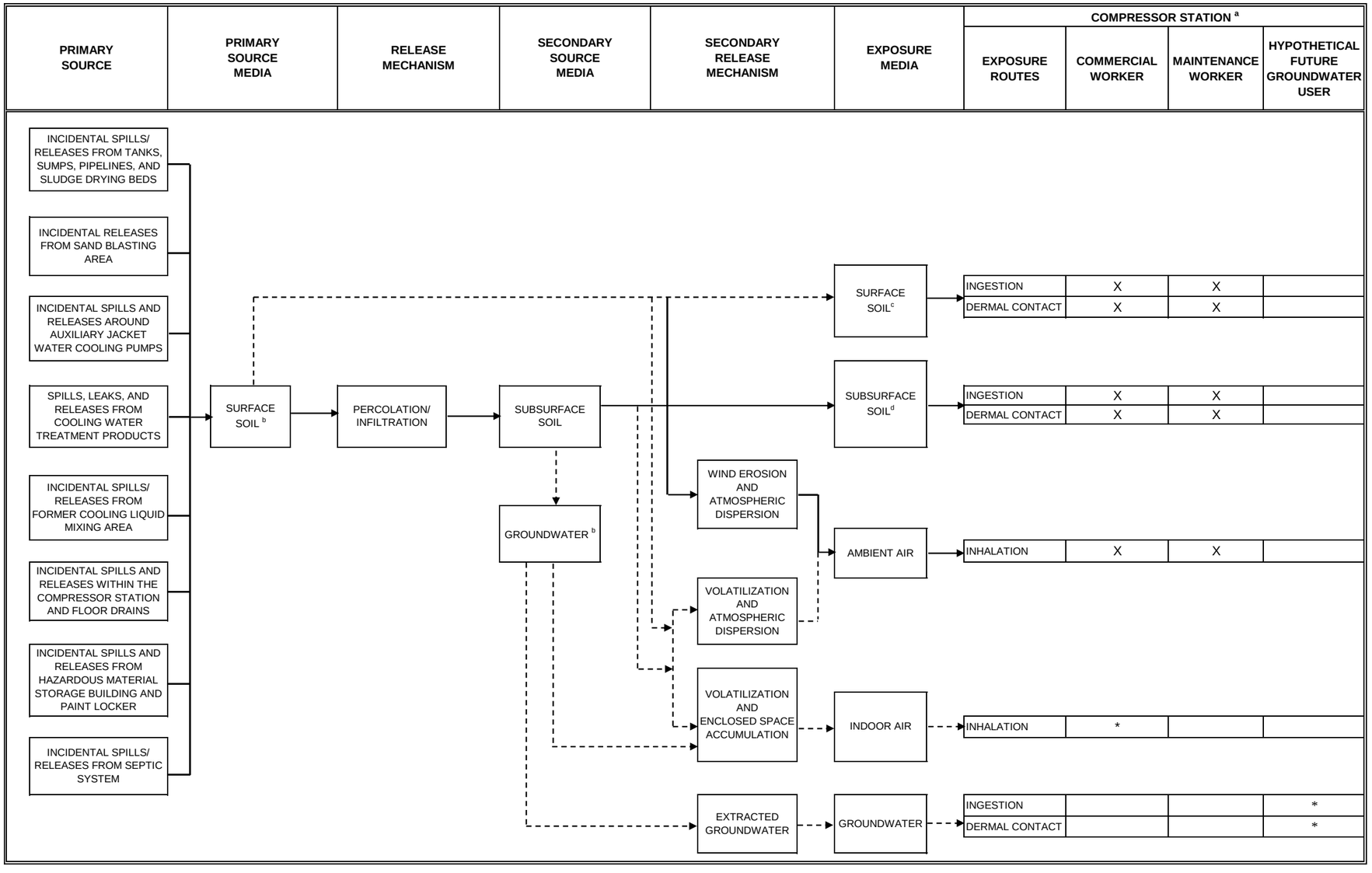
→ Potentially complete transport pathway to be included in the quantitative risk assessment.

⇢ Potentially complete transport pathway to be further evaluated in the risk assessment.

X Potentially complete exposure route to be included in the quantitative risk assessment.

* Potentially complete exposure route to be further evaluated in the risk assessment.

FIGURE 4-3
PRELIMINARY HUMAN HEALTH CSM FOR INSIDE THE COMPRESSOR STATION
PACIFIC GAS AND ELECTRIC COMPANY
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT



NOTES:

a The former sludge drying beds, chromate reduction tank, process pump tank, transfer sump, oil holding water tank, oil water separator, and wastewater transference pipelines inside the compressor station have already been closed (CH2MHILL, 2007i), but DTSC has requested additional investigation (CalEPA, 2007d). If complete pathways are identified based on the results, any of these areas will also be included in the HHRA.

b Potentially complete transport pathway from primary and secondary source media within the compressor station to exposure media outside of the compressor station and potentially complete exposure pathways will be further evaluated in the risk assessment in the context of areas outside of the compressor station (See Figures 4-1 and 4-2).

c Defined as soils collected at depths between 0 and 3 feet below ground surface (bgs).

d Defined as soils collected at depths between 3 and 10 feet bgs. A subset of this depth interval is near surface soil collected from 0 to 0.5 feet bgs.

→ Potentially complete transport pathway to be included in the quantitative risk assessment.

⇢ Potentially complete transport pathway to be further evaluated in the risk assessment.

X Potentially complete exposure route to be included in the quantitative risk assessment.

* Potentially complete exposure route to be further evaluated in the risk assessment.

ARCADIS

Appendix K

Evaluation of Secondary Exposure Pathways

ARCADIS
Infrastructure, environment, buildings

Imagine the result

Pacific Gas and Electric Company

Appendix K – Evaluation of Secondary Exposure Pathways

HERA of Groundwater Impacted by Activities at
SWMU 1/AOC 1 and SWMU 2
Topock Compressor Station, Needles, California

November 2009

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1. Introduction 1

2. Evaluation of Secondary Exposure Pathways 2

3. Conclusion 4

4. References 5

Table

K-1 Exposure of Humans to COPCs Through Ingestion of Plants and Animals Impacted by COPCs

Acronyms and Abbreviations

AOC	Area of Concern
ATSDR	Agency for Toxic Substances and Disease Registry
CalEPA	California Environmental Protection Agency
COPC	constituent of potential concern
CSM	conceptual site model
HI	hazard index
NCP	National Contingency Plan
OEHHA	Office of Environmental Health Hazard Assessment
RBC	risk-based concentration
SWMU	Solid Waste Management Unit
USDOI	U.S. Department of the Interior
USEPA	U.S. Environmental Protection Agency
WHO	World Health Organization

1. Introduction

The Human and Ecological Risk Assessment of Groundwater Affected by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2 is based on the conceptual site model (CSM) presented on Figure 5-1 of the main text. Potential direct exposure pathways to humans include: direct dermal exposure to and ingestion of contaminated groundwater. A concern raised by the U.S. Department of the Interior (USDOI) is the possibility that secondary exposure pathways (e.g., ingestion of plants or animals that are exposed to polluted groundwater) could contribute materially to the overall exposure to humans. As requested by USDOI, presented in this appendix is a preliminary evaluation of the magnitude of human exposure to constituents in groundwater from these potentially complete secondary exposure pathways.

2. Evaluation of Secondary Exposure Pathways

An analysis of the ingestion of plant and animal products as a pathway for exposure to contaminated groundwater was conducted based on the California Environmental Protection Agency (CalEPA) Office of Environmental Health Hazard Assessment (OEHHA) in the *Air Toxics Hot Spots Guidelines* (CalEPA, 2003) to assess the potential relative magnitude of this pathway as compared to direct dermal exposure to and ingestion of contaminated groundwater.

Section 5 of the Hot Spots Guidance provides equations for calculating the exposure of humans to constituents of potential concern (COPCs) through ingestion of plants and animals impacted by COPCs. First, uptake of COPCs by plants and animals is estimated. Second, the ingestion of these plant and animal products is calculated to estimate human exposure to COPCs. Plant COPC concentrations are based on uptake from soil impacted by irrigation. Animal COPC concentrations are based the following:

- Uptake from ingestion of groundwater
- Uptake from ingestion of soil impacted by irrigation water (i.e., groundwater used for irrigation purposes)
- Uptake from ingestion of plants impacted by irrigation water (i.e., groundwater used for irrigation purposes).

Throughout the analysis, the most conservative assumptions are made to quantify the magnitude of the dose resulting from this pathway. The Hot Spots Guidance calculates the concentration of the contaminant in soil from the deposition of the pollutant from some concentration in air. Because this is a groundwater risk assessment, potential deposition of the pollutant occurs through theoretical irrigation and not through aerial deposition.

It is conservatively assumed that 100% of the irrigation water is impacted groundwater. Furthermore, it is assumed that all of the impacted groundwater stays within the root zone where plants could be exposed. These assumptions likely result in a conservative estimate for the concentration of COPCs in soil. Regardless, the calculation of the soil concentration is unlikely to impact the overall conclusions. Human uptake of COPCs from assumed ingestion of plants and animals is dominated by ingestion of animals. Moreover, the predicted COPC concentration in animals resulting from ingestion of groundwater is much larger than that resulting from uptake of soil (either through direct

ingestion or via plant uptake), as quantified below. Accordingly, only the potential animal uptake of drinking impacted groundwater is significant in the context of this analysis.

The analysis is conducted for hexavalent chromium, the primary COPC at the site. As noted above, the theoretical dominant contributor to the overall pathway is animal uptake from ingestion of drinking water, in particular, beef cattle. It is conservatively assumed that 100% of the water ingested by the animals is impacted groundwater. Ingestion of groundwater by animals contributes nearly 100% to the dose of the contaminant to animals. The assumed ingestion of animal products contributes nearly 100% to the overall dose to humans from the ingestion of animal and plant products. Calculations for these pathways are presented in Table K-1.

To evaluate the overall significance of the assumed plant and animal ingestion exposure pathway, the contributions of direct dermal exposure and groundwater ingestion (the pathways considered in the risk assessment) are added to the contribution calculated for ingestion of plant and animal products. Using conservative assumptions to calculate the exposure dose to humans from the ingestion of plant and animal products, this theoretical pathway contributes 3.2% and 1.4% to the estimated total hexavalent chromium exposure for adults and children, respectively, as presented in Table K-1. It is expected that conducting this analysis for other COPCs will produce similar results. Therefore, inclusion of these secondary pathways is highly unlikely to affect the overall conclusions of the groundwater risk assessment, across all COPCs.

Moreover, specifically for hexavalent chromium, there is some uncertainly as to the uptake of the hexavalent form. In this analysis, hexavalent chromium is conservatively assumed to remain in its oxidized form throughout the pathway. However, some studies have indicated that chromium accumulation in plants is predominately in roots and only a small fraction is translocated to the above-ground part of edible plants (Cary, 1982; World Health Organization [WHO], 1988). Hexavalent chromium is reduced to trivalent chromium at the surface of plant root cells (Ramachandran et al., 1980; Aldrich et al., 2003), indicating plant uptake/translocation of hexavalent chromium would be minimal. There has been no evidence of chromium biomagnification along the terrestrial food chain (soil-plant-animal) (Agency for Toxic Substances and Disease Registry [ATSDR], 2008). Furthermore, the metabolism of animals has been shown to reduce hexavalent chromium to trivalent chromium (Petrilli and DeFlora, 1978). Therefore, the exposure dose estimated in Table K-1 for ingestion of plants and animals is expected to be overestimated, and the percentage of the overall dose is also expected to be overestimated.

3. Conclusion

Based on the quantification of assumed human exposure to impacted groundwater through ingestion of plants and animals exposed to impacted groundwater, it is highly unlikely that secondary exposure pathways are significant to the overall conclusions of the groundwater health risk assessment. As indicated in this appendix, potential human exposure to contaminated groundwater is dominated by the assumed direct exposure routes that are included in the groundwater risk assessment: direct dermal exposure to and ingestion of contaminated groundwater.

4. References

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Table

Table K-1. Exposure of Humans to COPCs Through Ingestion of Plants and Animals Impacted by COPCs

Parameter	Symbol	Value				Units	Source/notes
Equation 5.3.2 C – Concentration in soil							
Irrigation rate	Irr	5.62E-04				m/d	Estimate / http://www.ces.ncsu.edu/depts/hort/hil/hil-33-e.html
Assumed hexavalent chromium concentration in water	Cw	1				mg/L	The assumed concentration of hexavalent chromium does not affect the percentage contribution of the secondary pathways.
Deposition of affected soil	Dep	5.62E-04				$\mu g/m^2/d$	Dep = Cw [$\mu g/m^3$] * Irr [m/d]
Chemical-specific soil half-life	t1/2	1.00E+08				d	Table 5.3 in CalEPA, 2003
Soil elimination constant	Ks	6.93E-09				1/d	Default CalEPA, 2003
End of evaluation period	Tf	25550				d	Default CalEPA, 2003
Beginning of evaluation period	To	0				d	Default CalEPA, 2003
Total days of evaluation period	Tt	25550				d	Default CalEPA, 2003
Integral function	X	2.26					([exp(-Ks*Tf)-exp(-KsTo)]/Ks)+Tt
Soil mixing depth	SD	0.15				m	Default for agricultural setting (produce and meat pathways) CalEPA, 2003
Soil bulk density	BD	1333				kg/m^3	Default CalEPA, 2003
Average concentration in soil	**Cs**	**3.59E-02**				**µg/kg**	See equations in CalEPA, 2003
Equation 5.3.4.1 A – Concentration in vegetation		Exposed	Leafy	Protected	Root		
Interception fraction	IF	0.1	0.2	0	0		Default CalEPA, 2003
Weathering constant	k	0.1	0.1	0.1	0.1	1/d	Default CalEPA, 2003
Yield	Y	2	2	2	2	kg/m^2	Default CalEPA, 2003
Growth period	T	90	45	NA	NA	d	Default CalEPA, 2003
Concentration due to direct deposition	Cdep,v	2.81E-04	5.56E-04	0.00E+00	0.00E+00	µg/kg	No deposition on root or protected crops per CalEPA, 2003
Uptake factor based on soil concentration	UF2	7.00E-04	8.00E-04	7.00E-04	1.00E-03		Default CalEPA, 2003
Concentration due to root translocation or uptake	Ctrans	2.52E-05	2.87E-05	2.52E-05	3.59E-05	µg/kg	See equations in CalEPA, 2003
Gastrointestinal relative absorption fraction	GRAF	1	1	1	1		Default CalEPA, 2003
Average concentration in and on specific types of vegetation	**Cv**	**3.06E-04**	**5.85E-04**	**2.52E-05**	**3.59E-05**	**µg/kg**	See equations in CalEPA, 2003

Table K-1. Exposure of Humans to COPCs Through Ingestion of Plants and Animals Impacted by COPCs

Parameter	Symbol	Value					Units	Source/notes
Equation 5.3.4.2 E – Concentration in animals and animal products		Beef Cattle	Lactating Dairy Cattle	Pigs	Poultry - Meat	Poultry - Egg		
Inhalation rate for animal	BRa	100	100	7	0.4	0.4	m^3/d	Default CalEPA, 2003
Ground-level concentration	GLC	0	0	0	0	0	$\mu g/m^3$	Assumed, contaminated groundwater present as a result of irrigation only
Inhalation exposure	Inh_dose	0	0	0	0	0	µg/d	See equations in CalEPA, 2003
Water ingestion for animal	WIRa	40	80	8	0.2	0.2	kg/d	Default CalEPA, 2003
Fraction of water ingested from a contaminated body of water	FSW	1	1	1	1	1		Conservatively assumed
Average concentration in water	Cw	1000	1000	1000	1000	1000	µg/kg	See equations in CalEPA, 2003
Water ingestion exposure	Water_ingestion	40000	80000	8000	200	200	µg/d	See equations in CalEPA, 2003
Fraction of diet provided by grazing	FG	0.5	0.5	0.5	0.5	0.5		Default CalEPA, 2003
Feed ingestion rate	FIR	8	16	2	0.1	0.1	kg/d	Default CalEPA, 2003
Fraction of locally grown (source impacted) feed that is not pasture	L	1	1	0.1	0.05	0.05		Default CalEPA, 2003
Concentration in feed	Cf	5.85E-04	5.85E-04	2.38E-04	2.38E-04	2.38E-04	µg/kg	See note under Table 5.2 in CalEPA, 2003
Feed ingestion exposure		2.34E-03	4.68E-03	2.38E-05	5.95E-07	5.95E-07	µg/d	See equations in CalEPA, 2003
Concentration in pasture/grazing material	Cv	5.85E-04	5.85E-04	2.38E-04	2.38E-04	2.38E-04	µg/kg	See equations in CalEPA, 2003
Pasture/grazing ingestion exposure	Grazing_ingest	2.34E-03	4.68E-03	2.38E-04	1.19E-05	1.19E-05	µg/d	See equations in CalEPA, 2003
Soil ingested as a fraction of feed ingested	FSf	0.01	0.01	0	0	0		Default CalEPA, 2003
Soil ingested as a fraction of pasture ingested	FSp	0.05	0.05	0.04	0.02	0.02		Default CalEPA, 2003
Soil ingestion rate	SIa	0.24	0.48	0.04	0.001	0.001	kg/d	Default CalEPA, 2003
Soil ingestion exposure	Soil _ingest	0.008623694	0.017247389	0.00143728	3.5932E-05	3.5932E-05	µg/d	Default CalEPA, 2003
Transfer coefficient of contaminant from diet to animal product	Tco	9.20E-03	1.00E-05	9.20E-03	9.20E-03	9.20E-03	d/kg	Chemical-specific default CalEPA, 2003
Average concentration in farm animals and their products	**Cfa**	**3.68E+02**	**8.00E-01**	**7.36E+01**	**1.84E+00**	**1.84E+00**	**µg/kg**	See equations in CalEPA, 2003
Equation 5.4.3.3a C – Exposure dose through ingestion of plant products		Exposed	Leafy	Protected	Root			
Concentration in plant type	Cf	3.06E-04	5.85E-04	2.52E-05	3.59E-05		µg/kg	See equations in CalEPA, 2003
Consumption of produce	IP	3.56	2.9	1.39	3.16		g/kg BW-day	Default average 70-year exposure numbers used. High end numbers also available, CalEPA, 2003
Gastrointestinal relative absorption fraction	GRAF	1	1	1	1			Default CalEPA, 2003
Fraction of produce homegrown	L	0.15	0.15	0.15	0.15			Default for nonurban sites used, CalEPA, 2003
Exposure frequency	EF	350	350	350	350		d/yr	Default based on CalEPA guidance, see Section 5 of the main text
Exposure duration	ED	30	30	30	30		yr	Default based on CalEPA guidance, see Section 5 of the main text
Averaging time	AT	10950	10950	10950	10950		d	Default based on CalEPA guidance, see Section 5 of the main text
Conversion factor	CF	1.00E-06	1.00E-06	1.00E-06	1.00E-06		µg/kg to mg/g	
Exposure dose through ingestion of plant products	**Dose-p**	**1.57E-10**	**2.44E-10**	**5.03E-12**	**1.63E-11**		**mg/kg/d**	See equations in CalEPA, 2003

Table K-1. Exposure of Humans to COPCs Through Ingestion of Plants and Animals Impacted by COPCs

Parameter	Symbol	Value					Units	Source/notes
Equation 5.4.3.3 – Exposure dose through ingestion of animal products		Beef Cattle	Lactating Dairy Cattle	Pigs	Poultry - Meat	Poultry - Egg		
Concentration in animal product	Cfa	3.68E+02	8.00E-01	7.36E+01	1.84E+00	1.84E+00	µg/kg	See equations in CalEPA, 2003
Consumption of animal product	If	2.25	5.46	1.46	1.39	1.8	g/kg BW-day	Default average 70-year exposure numbers used. High end numbers also available
Gastrointestinal absorption factor	GI	1	1	1	1	1		Default CalEPA, 2003
Fraction of animal product homegrown	L	1	1	1	1	1		Conservatively assumed
Exposure frequency	EF	350	350	350	350	350	d/yr	Default based on CalEPA guidance, see Section 5 of the main text
Exposure duration	ED	30	30	30	30	30	yr	Default based on CalEPA guidance, see Section 5 of the main text
Averaging time	AT	10950	10950	10950	10950	10950	d	Default based on CalEPA guidance, see Section 5 of the main text
Conversion factor	CF	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	µg/kg to mg/g	
Exposure dose through ingestion of animal products	**Dose-ap**	**7.94E-04**	**4.19E-06**	**1.03E-04**	**2.45E-06**	**3.18E-06**	**mg/kg-BW/d**	See equations in CalEPA, 2003
Total dose from ingestion of animal and plant products	**Dose-total**	**9.07E-04**					**mg/kg-BW/d**	Summed
Exposure through dermal contact		Adult	Child					
Concentration in water	Cw	1	1				mg/L	The assumed concentration of hexavalent chromium does not affect the percentage contribution of the secondary pathways.
Surface area	SA	18000	6600				cm^2	Default based on CalEPA guidance, see Section 5 of the main text
Dermal permeability coefficient	PC	0.002	0.002				cm/hr	Default based on CalEPA guidance, see Section 5 of the main text
Exposure time	ET	0.58	1				hr/d	Default based on CalEPA guidance, see Section 5 of the main text
Exposure duration	ED	30	6				yr	Default based on CalEPA guidance, see Section 5 of the main text
Exposure frequency	EF	350	350				d/yr	Default based on CalEPA guidance, see Section 5 of the main text
Conversion factor	CF	0.001	0.001				L/cm^3	
Body weight	BW	70	15				kg	Default based on CalEPA guidance, see Section 5 of the main text
Averaging time	AT	10950	2190				d	Default based on CalEPA guidance, see Section 5 of the main text
Chronic daily intake from dermal exposure to groundwater	**CDIderm**	**2.86E-04**	**8.44E-04**				**mg/kg/d**	Calculated, see Sections 5, 6, and 7 of the main text
Exposure through ingestion		Adult	Child					
Ingestion rate	IR	2	1				L/d	Default based on CalEPA guidance, see Section 5 of the main text
Chronic daily intake from ingestion of groundwater	**CDIing**	**2.74E-02**	**6.39E-02**				**mg/kg/d**	Calculated, see Sections 5, 6, and 7 of the main text
		Adult	Child					
Total chronic daily intake from dermal and ingestion	CDItot	2.77E-02	6.48E-02				**mg/kg/d**	Summed
Total dose from ingestion of animal and plant products		9.07E-04					**mg/kg/d**	From above
Percentage of exposure from ingestion of animal and plant products		**3.2%**	**1.4%**					Calculated

Table K-1. Exposure of Humans to COPCs Through Ingestion of Plants and Animals Impacted by COPCs

Parameter	Symbol	Value	Units	Source/notes

Notes:

(1) The equations used are from the Air Toxics Hot Spots Program Risk Assessment Guidelines (CalEPA, 2003).

(2) Default assumptions are used when available. Conservative or best-judgment assumptions are made in other cases.

References:

CalEPA. 2003. Air Toxics Hot Spots Program Risk Assessment Guidelines: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA). August.

cm/hr = centimeter per hour
cm^2 = square centimeter
COPC = constituent of potential concern
d = day
d/kg = day per kilogram
d/yr = days per year
g/kg BW-day = gram per kilogram body weight per day
hr/d = hour per day
kg = kilogram
kg/d = kilogram per day
kg/m^2 = kilogram per square meter
kg/m^3 = kilogram per cubic meter
L/cm^3 = liters per cubic centimeter
L/d = liters per day
m = meter
m/d = meter per day
m^3/d = cubic meter per day
mg/g = milligram per gram
mg/kg BW/d = milligram per kilogram body weight per day
mg/kg/d = milligram per kilogram per day
mg/L = milligram per liter
µg/d = microgram per day
µg/kg = microgram per kilogram
$µg/m^2/d$ = microgram per square meter per day
$µg/m^3$ = microgram per cubic meter
yr = year

ARCADIS

Appendix L

Groundwater Chronic Daily Intakes

Table L-1. Groundwater CDIs – Well-Specific – Carcinogenic Effects

Chemical of Potential Concern	Groundwater CDI – Carcinogenic Effects (mg/kg/d)					
	On-Site Resident Child		On-Site Resident Adult		On-Site Resident Age-Adjusted	
	Dermal Contact	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-12						
Aluminum	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC
Arsenic	3.8E-06	5.8E-04	6.5E-06	1.2E-03	9.0E-06	1.6E-03
Barium	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC
MW-24A						
Aluminum	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC
Arsenic	1.2E-06	1.8E-04	2.1E-06	3.9E-04	2.9E-06	5.0E-04
Barium	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC

Table L-1. Groundwater CDIs – Well-Specific – Carcinogenic Effects

Chemical of Potential Concern	Groundwater CDI – Carcinogenic Effects (mg/kg/d)					
	On-Site Resident Child		On-Site Resident Adult		On-Site Resident Age-Adjusted	
	Dermal Contact	Ingestion	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-43-25						
Aluminum	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC
Arsenic	8.8E-07	1.3E-04	1.5E-06	2.9E-04	2.1E-06	3.6E-04
Barium	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC

Notes:
CDI = chronic daily intake
mg/kg/d = milligrams per kilogram per day
NC = noncarcinogenic compound

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-1				
Aluminum	2.9E-05	4.4E-03	9.8E-06	1.9E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	3.4E-03	5.1E-01	1.1E-03	2.2E-01
Mercury	ND	ND	ND	ND
Molybdenum	3.3E-05	5.0E-03	1.1E-05	2.1E-03
Nickel	1.9E-06	1.5E-03	6.6E-07	6.3E-04
Nitrate as nitrogen	2.6E-03	4.0E-01	9.0E-04	1.7E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-3				
Aluminum	2.7E-05	4.1E-03	9.1E-06	1.7E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.4E-05	2.2E-03	4.9E-06	9.4E-04
Nickel	3.5E-06	2.7E-03	1.2E-06	1.2E-03
Nitrate as nitrogen	4.6E-03	7.0E-01	1.6E-03	3.0E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-4				
Aluminum	2.6E-05	4.0E-03	8.8E-06	1.7E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	1.9E-06	1.4E-03	6.3E-07	6.0E-04
Nitrate as nitrogen	2.6E-03	4.0E-01	9.0E-04	1.7E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-5				
Aluminum	2.5E-05	3.7E-03	8.4E-06	1.6E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	3.9E-05	5.8E-03	1.3E-05	2.5E-03
Nickel	1.7E-06	1.3E-03	5.7E-07	5.5E-04
Nitrate as nitrogen	8.0E-03	1.2E+00	2.7E-03	5.2E-01
Selenium	8.6E-06	1.3E-03	2.9E-06	5.6E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-6				
Aluminum	2.6E-05	4.0E-03	8.8E-06	1.7E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	3.6E-03	5.5E-01	1.2E-03	2.4E-01
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-7				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	1.7E-06	1.3E-03	5.7E-07	5.5E-04
Nitrate as nitrogen	3.3E-03	5.0E-01	1.1E-03	2.1E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-8				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	4.3E-05	3.3E-03	1.5E-05	1.4E-03
Cobalt	ND	ND	ND	ND
Copper	4.8E-06	7.3E-04	1.6E-06	3.1E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	1.4E-06	1.0E-03	4.6E-07	4.4E-04
Nitrate as nitrogen	8.6E-03	1.3E+00	2.9E-03	5.6E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-9				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.9E-04	2.2E-02	1.0E-04	9.5E-03
Cobalt	ND	ND	ND	ND
Copper	3.1E-06	4.7E-04	1.0E-06	2.0E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	6.8E-07	5.1E-04	2.3E-07	2.2E-04
Nitrate as nitrogen	9.5E-03	1.4E+00	3.2E-03	6.2E-01
Selenium	5.6E-06	8.4E-04	1.9E-06	3.6E-04
Silver	1.5E-06	3.8E-04	5.1E-07	1.6E-04
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.2E-05	1.3E-02	1.8E-05	5.6E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-10				
Aluminum	2.7E-05	4.1E-03	9.2E-06	1.8E-03
Antimony	1.4E-06	2.1E-04	4.7E-07	9.0E-05
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	1.7E-03	1.3E-01	5.8E-04	5.6E-02
Cobalt	ND	ND	ND	ND
Copper	2.1E-06	3.1E-04	7.0E-07	1.3E-04
Fluoride	1.0E-02	1.6E+00	3.5E-03	6.7E-01
Mercury	ND	ND	ND	ND
Molybdenum	7.0E-05	1.1E-02	2.4E-05	4.6E-03
Nickel	5.6E-07	4.3E-04	1.9E-07	1.8E-04
Nitrate as nitrogen	6.8E-03	1.0E+00	2.3E-03	4.4E-01
Selenium	3.2E-06	4.8E-04	1.1E-06	2.1E-04
Silver	1.6E-05	4.0E-03	5.3E-06	1.7E-03
Thallium	ND	ND	ND	ND
Vanadium	2.5E-05	3.8E-03	8.4E-06	1.6E-03
Zinc	4.6E-05	1.2E-02	1.6E-05	5.0E-03
MW-11				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	3.9E-05	5.9E-03	1.3E-05	2.5E-03
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	7.3E-04	5.5E-02	2.5E-04	2.4E-02
Cobalt	ND	ND	ND	ND
Copper	2.0E-06	3.1E-04	6.9E-07	1.3E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	5.9E-07	4.4E-04	2.0E-07	1.9E-04
Nitrate as nitrogen	4.4E-03	6.7E-01	1.5E-03	2.9E-01
Selenium	3.4E-06	5.2E-04	1.2E-06	2.2E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	4.5E-05	1.1E-02	1.5E-05	4.9E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-12				
Aluminum	2.9E-05	4.3E-03	9.7E-06	1.9E-03
Antimony	8.8E-06	1.3E-03	3.0E-06	5.7E-04
Arsenic	4.5E-05	6.8E-03	1.5E-05	2.9E-03
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	1.1E-03	8.6E-02	3.8E-04	3.7E-02
Cobalt	ND	ND	ND	ND
Copper	2.1E-06	3.2E-04	7.1E-07	1.4E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.3E-05	3.5E-03	7.8E-06	1.5E-03
Nickel	5.3E-07	4.0E-04	1.8E-07	1.7E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	4.7E-07	7.1E-05	1.6E-07	3.0E-05
Vanadium	3.5E-05	5.2E-03	1.2E-05	2.2E-03
Zinc	ND	ND	ND	ND
MW-13				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	2.7E-06	4.1E-04	9.3E-07	1.8E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	2.3E-06	1.7E-03	7.7E-07	7.4E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.5E-05	1.4E-02	1.9E-05	5.9E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-14				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.7E-05	2.8E-03	1.2E-05	1.2E-03
Cobalt	4.3E-07	6.5E-05	1.4E-07	2.8E-05
Copper	3.4E-06	5.1E-04	1.1E-06	2.2E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	1.1E-06	8.6E-04	3.8E-07	3.7E-04
Nitrate as nitrogen	3.1E-03	4.7E-01	1.0E-03	2.0E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	4.5E-05	1.1E-02	1.5E-05	4.8E-03
MW-15				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.4E-05	1.0E-03	4.7E-06	4.5E-04
Cobalt	NS	NS	NS	NS
Copper	3.9E-06	6.0E-04	1.3E-06	2.6E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	6.6E-07	5.0E-04	2.3E-07	2.2E-04
Nitrate as nitrogen	4.1E-03	6.2E-01	1.4E-03	2.7E-01
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	4.8E-05	1.2E-02	1.6E-05	5.2E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-19				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	7.6E-04	5.8E-02	2.6E-04	2.5E-02
Cobalt	ND	ND	ND	ND
Copper	2.8E-06	4.2E-04	9.4E-07	1.8E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	6.4E-07	4.8E-04	2.2E-07	2.1E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.5E-05	1.4E-02	1.9E-05	6.0E-03
MW-20-70				
Aluminum	ND	ND	ND	ND
Antimony	3.7E-06	5.6E-04	1.3E-06	2.4E-04
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	8.1E-03	6.2E-01	2.8E-03	2.6E-01
Cobalt	ND	ND	ND	ND
Copper	4.6E-06	6.9E-04	1.5E-06	3.0E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	5.9E-07	4.5E-04	2.0E-07	1.9E-04
Nitrate as nitrogen	5.2E-03	7.9E-01	1.8E-03	3.4E-01
Selenium	5.0E-06	7.5E-04	1.7E-06	3.2E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	2.4E-05	3.7E-03	8.3E-06	1.6E-03
Zinc	5.0E-05	1.3E-02	1.7E-05	5.4E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-20-100				
Aluminum	NS	NS	NS	NS
Antimony	1.8E-05	2.7E-03	6.1E-06	1.2E-03
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	6.2E-03	4.7E-01	2.1E-03	2.0E-01
Cobalt	ND	ND	ND	ND
Copper	4.9E-06	7.4E-04	1.6E-06	3.2E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	1.9E-06	1.5E-03	6.5E-07	6.2E-04
Nitrate as nitrogen	5.9E-03	9.0E-01	2.0E-03	3.9E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	4.9E-05	1.2E-02	1.6E-05	5.3E-03
MW-20-130				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	7.2E-03	5.5E-01	2.4E-03	2.3E-01
Cobalt	4.6E-07	7.0E-05	1.6E-07	3.0E-05
Copper	5.0E-06	7.5E-04	1.7E-06	3.2E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.0E-05	3.1E-03	6.8E-06	1.3E-03
Nickel	2.8E-06	2.1E-03	9.3E-07	8.9E-04
Nitrate as nitrogen	4.8E-03	7.3E-01	1.6E-03	3.1E-01
Selenium	6.7E-06	1.0E-03	2.3E-06	4.3E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	4.3E-05	6.5E-03	1.4E-05	2.8E-03
Zinc	2.7E-05	6.9E-03	9.3E-06	3.0E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-21				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	1.1E-05	1.7E-03	3.8E-06	7.4E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.2E-05	3.3E-03	7.4E-06	1.4E-03
Nickel	4.1E-06	3.1E-03	1.4E-06	1.3E-03
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	1.6E-05	2.4E-03	5.4E-06	1.0E-03
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	8.3E-05	2.1E-02	2.8E-05	8.9E-03
MW-22				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	2.1E-04	3.2E-02	7.2E-05	1.4E-02
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	2.1E-06	3.2E-04	7.2E-07	1.4E-04
Copper	3.3E-05	5.0E-03	1.1E-05	2.1E-03
Fluoride	ND	ND	ND	ND
Mercury	1.7E-07	2.6E-05	5.7E-08	1.1E-05
Molybdenum	2.4E-05	3.6E-03	8.0E-06	1.5E-03
Nickel	1.3E-05	9.6E-03	4.3E-06	4.1E-03
Nitrate as nitrogen	2.8E-03	4.3E-01	9.7E-04	1.8E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	7.6E-05	1.1E-02	2.6E-05	4.9E-03
Zinc	5.0E-05	1.3E-02	1.7E-05	5.4E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-23				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	2.2E-03	3.4E-01	7.6E-04	1.5E-01
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	7.8E-06	1.2E-03	2.6E-06	5.1E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	6.9E-06	5.3E-03	2.4E-06	2.3E-03
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	4.6E-06	7.0E-04	1.6E-06	3.0E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	6.7E-05	1.7E-02	2.3E-05	7.3E-03
MW-24A				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	1.4E-05	2.1E-03	4.8E-06	9.2E-04
Barium	4.0E-04	6.0E-02	1.4E-04	2.6E-02
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.8E-03	2.1E-01	9.6E-04	9.2E-02
Cobalt	ND	ND	ND	ND
Copper	5.9E-06	9.0E-04	2.0E-06	3.9E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.7E-05	2.5E-03	5.7E-06	1.1E-03
Nickel	5.6E-07	4.2E-04	1.9E-07	1.8E-04
Nitrate as nitrogen	7.7E-03	1.2E+00	2.6E-03	5.0E-01
Selenium	2.1E-05	3.2E-03	7.3E-06	1.4E-03
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.4E-05	1.4E-02	1.8E-05	5.8E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-24B				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	4.2E-03	3.1E-01	1.4E-03	1.3E-01
Cobalt	ND	ND	ND	ND
Copper	2.7E-06	4.1E-04	9.3E-07	1.8E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.7E-05	4.1E-03	9.3E-06	1.8E-03
Nickel	1.0E-06	7.9E-04	3.5E-07	3.4E-04
Nitrate as nitrogen	5.9E-03	8.9E-01	2.0E-03	3.8E-01
Selenium	6.0E-06	9.1E-04	2.0E-06	3.9E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.9E-05	1.5E-02	2.0E-05	6.4E-03
MW-24BR				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	1.3E-04	1.9E-02	4.3E-05	8.2E-03
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.9E-04	2.2E-02	9.9E-05	9.5E-03
Cobalt	NS	NS	NS	NS
Copper	6.5E-06	9.8E-04	2.2E-06	4.2E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	2.4E-05	3.7E-03	8.3E-06	1.6E-03
Nickel	6.4E-07	4.8E-04	2.2E-07	2.1E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	2.0E-05	5.0E-03	6.8E-06	2.2E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-25				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.0E-03	1.5E-01	6.8E-04	6.5E-02
Cobalt	ND	ND	ND	ND
Copper	3.2E-06	4.9E-04	1.1E-06	2.1E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	4.9E-07	3.7E-04	1.7E-07	1.6E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	2.4E-06	3.6E-04	8.1E-07	1.6E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	4.2E-05	1.1E-02	1.4E-05	4.5E-03
MW-26				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.1E-03	2.4E-01	1.1E-03	1.0E-01
Cobalt	ND	ND	ND	ND
Copper	4.0E-06	6.0E-04	1.3E-06	2.6E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.8E-05	2.7E-03	6.1E-06	1.2E-03
Nickel	8.4E-07	6.4E-04	2.8E-07	2.7E-04
Nitrate as nitrogen	2.3E-03	3.4E-01	7.7E-04	1.5E-01
Selenium	7.1E-06	1.1E-03	2.4E-06	4.6E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.3E-05	1.3E-02	1.8E-05	5.8E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-27-20				
Aluminum	ND	ND	ND	ND
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	1.1E-04	1.7E-02	3.7E-05	7.1E-03
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	8.0E-06	1.2E-03	2.7E-06	5.2E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	3.9E-06	3.0E-03	1.3E-06	1.3E-03
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	4.5E-05	1.1E-02	1.5E-05	4.9E-03
MW-28-25				
Aluminum	ND	ND	ND	ND
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	1.0E-04	1.5E-02	3.4E-05	6.6E-03
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	3.7E-06	5.6E-04	1.3E-06	2.4E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	7.5E-07	5.7E-04	2.6E-07	2.4E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	3.9E-05	9.8E-03	1.3E-05	4.2E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-29				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	1.3E-04	1.9E-02	4.3E-05	8.2E-03
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	4.1E-06	6.2E-04	1.4E-06	2.7E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	8.6E-07	6.5E-04	2.9E-07	2.8E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	4.3E-05	1.1E-02	1.4E-05	4.6E-03
MW-30-30				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	4.6E-04	7.0E-02	1.6E-04	3.0E-02
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	1.5E-05	2.2E-03	5.0E-06	9.5E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	4.2E-05	6.4E-03	1.4E-05	2.7E-03
Nickel	2.2E-05	1.7E-02	7.5E-06	7.2E-03
Nitrate as nitrogen	6.1E-03	9.2E-01	2.1E-03	3.9E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	8.4E-05	1.3E-02	2.9E-05	5.5E-03
Zinc	4.5E-05	1.1E-02	1.5E-05	4.9E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-30-50				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.1E-03	8.5E-02	3.8E-04	3.6E-02
Cobalt	NS	NS	NS	NS
Copper	1.7E-05	2.5E-03	5.6E-06	1.1E-03
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	9.2E-05	2.3E-02	3.1E-05	1.0E-02
MW-31-60				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.3E-03	2.5E-01	1.1E-03	1.1E-01
Cobalt	ND	ND	ND	ND
Copper	6.2E-06	9.5E-04	2.1E-06	4.1E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	3.7E-06	2.8E-03	1.3E-06	1.2E-03
Nitrate as nitrogen	2.1E-03	3.2E-01	7.2E-04	1.4E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	5.0E-05	7.5E-03	1.7E-05	3.2E-03
Zinc	3.8E-05	9.7E-03	1.3E-05	4.1E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-31-135				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.4E-04	1.8E-02	8.1E-05	7.8E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-32-20				
Aluminum	ND	ND	ND	ND
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	2.2E-03	3.3E-01	7.4E-04	1.4E-01
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	2.2E-05	5.5E-03	7.4E-06	2.3E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-32-35				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	NS	NS	NS	NS
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	8.0E-05	2.0E-02	2.7E-05	8.7E-03
MW-33-40				
Aluminum	ND	ND	ND	ND
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	8.0E-06	1.2E-03	2.7E-06	5.2E-04
Fluoride	3.7E-03	5.6E-01	1.3E-03	2.4E-01
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	4.3E-05	1.1E-02	1.5E-05	4.7E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-33-90				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	1.3E-04	2.0E-02	4.4E-05	8.4E-03
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.6E-05	2.4E-03	5.3E-06	1.0E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	8.0E-05	2.0E-02	2.7E-05	8.6E-03
MW-33-210				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	5.3E-07	8.1E-05	1.8E-07	3.5E-05
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-34-55				
Aluminum	ND	ND	ND	ND
Antimony	1.1E-05	1.7E-03	3.7E-06	7.1E-04
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	5.1E-06	7.7E-04	1.7E-06	3.3E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	8.9E-07	6.8E-04	3.0E-07	2.9E-04
Nitrate as nitrogen	NS	NS	NS	NS
Selenium	5.3E-06	8.0E-04	1.8E-06	3.4E-04
Silver	1.0E-05	2.6E-03	3.5E-06	1.1E-03
Thallium	ND	ND	ND	ND
Vanadium	1.2E-04	1.8E-02	4.1E-05	7.9E-03
Zinc	ND	ND	ND	ND
MW-34-80				
Aluminum	2.6E-05	3.9E-03	8.7E-06	1.7E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	5.5E-07	8.3E-05	1.9E-07	3.6E-05
Copper	4.5E-06	6.8E-04	1.5E-06	2.9E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	6.9E-07	5.2E-04	2.3E-07	2.2E-04
Nitrate as nitrogen	NS	NS	NS	NS
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-34-100				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	6.0E-04	4.6E-02	2.0E-04	2.0E-02
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.5E-05	2.3E-03	5.2E-06	1.0E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-35-60				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.1E-05	2.4E-03	1.1E-05	1.0E-03
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-35-135				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.2E-05	1.7E-03	7.5E-06	7.2E-04
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-36-90				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.1E-03	1.6E-01	7.3E-04	7.0E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-36-100				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.3E-03	9.9E-02	4.4E-04	4.2E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
MW-37D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	1.3E-03	1.0E-01	4.5E-04	4.3E-02
Cobalt	4.9E-07	7.5E-05	1.7E-07	3.2E-05
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.0E-05	3.0E-03	6.8E-06	1.3E-03
Nickel	2.1E-06	1.6E-03	7.3E-07	7.0E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-38S				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	7.5E-04	5.7E-02	2.5E-04	2.4E-02
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.7E-05	4.1E-03	9.1E-06	1.7E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	4.4E-03	6.7E-01	1.5E-03	2.9E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-38D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.8E-04	1.4E-02	6.3E-05	6.0E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	3.4E-05	5.1E-03	1.1E-05	2.2E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	6.2E-03	9.4E-01	2.1E-03	4.0E-01
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-39-50				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.4E-03	1.1E-01	4.8E-04	4.6E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	2.7E-03	4.0E-01	9.0E-04	1.7E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
MW-39-60				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.5E-03	1.9E-01	8.4E-04	8.0E-02
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.7E-03	4.0E-01	9.0E-04	1.7E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-39-70				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	3.6E-03	2.7E-01	1.2E-03	1.2E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	3.8E-03	5.8E-01	1.3E-03	2.5E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
MW-39-80				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	3.7E-03	2.8E-01	1.3E-03	1.2E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	3.8E-03	5.7E-01	1.3E-03	2.4E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-39-100				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	6.6E-03	5.0E-01	2.3E-03	2.2E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	4.1E-03	6.3E-01	1.4E-03	2.7E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
MW-40S				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.8E-03	4.2E-01	9.4E-04	1.8E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-40D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	7.0E-05	5.3E-03	2.4E-05	2.3E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	1.9E-05	2.9E-03	6.6E-06	1.3E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	8.3E-03	1.3E+00	2.8E-03	5.4E-01
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-43-25				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	1.0E-05	1.6E-03	3.5E-06	6.7E-04
Barium	ND	ND	ND	ND
Beryllium	4.6E-07	7.0E-05	1.6E-07	3.0E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	NS	NS	NS	NS
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-44-115				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	1.1E-03	8.6E-02	3.8E-04	3.7E-02
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS
Mercury	ND	ND	ND	ND
Molybdenum	3.6E-05	5.5E-03	1.2E-05	2.3E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-44-125				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	3.2E-04	2.4E-02	1.1E-04	1.0E-02
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	5.3E-05	8.0E-03	1.8E-05	3.4E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.7E-03	4.1E-01	9.2E-04	1.8E-01
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-45-095a				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.2E-04	1.7E-02	7.4E-05	7.1E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-46-175				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.5E-04	1.1E-02	5.0E-05	4.8E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	8.3E-05	1.3E-02	2.8E-05	5.4E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-47-55				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	4.6E-05	3.5E-03	1.6E-05	1.5E-03
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-50-095				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.3E-04	1.7E-02	7.8E-05	7.5E-03
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
MW-50-200				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	9.2E-03	7.0E-01	3.1E-03	3.0E-01
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS
Mercury	ND	ND	ND	ND
Molybdenum	2.3E-05	3.5E-03	7.7E-06	1.5E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.6E-03	3.9E-01	8.7E-04	1.7E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
MW-51				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	4.0E-03	3.0E-01	1.3E-03	1.3E-01
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS
Mercury	ND	ND	ND	ND
Molybdenum	1.7E-05	2.6E-03	5.7E-06	1.1E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	5.9E-03	9.0E-01	2.0E-03	3.9E-01
Selenium	7.7E-06	1.2E-03	2.6E-06	5.0E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-1S				
Aluminum	5.0E-05	7.5E-03	1.7E-05	3.2E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
OW-1M				
Aluminum	4.7E-05	7.1E-03	1.6E-05	3.0E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	1.1E-06	1.6E-04	3.6E-07	6.8E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	8.9E-06	1.3E-03	3.0E-06	5.8E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-1D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	1.2E-06	1.8E-04	4.0E-07	7.7E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	9.1E-06	1.4E-03	3.1E-06	5.9E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.4E-05	2.1E-03	4.6E-06	8.9E-04
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	3.2E-05	4.8E-03	1.1E-05	2.1E-03
Zinc	ND	ND	ND	ND
OW-2S				
Aluminum	6.4E-05	9.7E-03	2.2E-05	4.2E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	7.6E-07	1.2E-04	2.6E-07	4.9E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.4E-05	2.5E-03	1.1E-05	1.1E-03
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.0E-05	3.0E-03	6.8E-06	1.3E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.1E-03	3.2E-01	7.1E-04	1.4E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-2M				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	9.7E-07	1.5E-04	3.3E-07	6.3E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	8.7E-06	1.3E-03	2.9E-06	5.6E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	1.5E-03	2.2E-01	5.0E-04	9.6E-02
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
OW-2D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	9.7E-07	1.5E-04	3.3E-07	6.3E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	7.8E-06	1.2E-03	2.7E-06	5.1E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.7E-05	2.6E-03	5.9E-06	1.1E-03
Nickel	1.1E-06	8.6E-04	3.9E-07	3.7E-04
Nitrate as nitrogen	2.0E-03	3.1E-01	6.9E-04	1.3E-01
Selenium	ND	ND	ND	ND
Silver	2.2E-06	5.4E-04	7.3E-07	2.3E-04
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-3D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.8E-05	2.8E-03	6.2E-06	1.2E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND
OW-5S				
Aluminum	4.2E-05	6.3E-03	1.4E-05	2.7E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	2.3E-05	1.7E-03	7.6E-06	7.3E-04
Cobalt	5.3E-07	8.0E-05	1.8E-07	3.4E-05
Copper	6.3E-06	9.6E-04	2.1E-06	4.1E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	1.9E-03	2.9E-01	6.4E-04	1.2E-01
Selenium	ND	ND	ND	ND
Silver	1.6E-05	4.1E-03	5.6E-06	1.8E-03
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
OW-5M				
Aluminum	3.2E-04	4.8E-02	1.1E-04	2.1E-02
Antimony	4.7E-06	7.1E-04	1.6E-06	3.0E-04
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	3.7E-06	5.6E-04	1.3E-06	2.4E-04
Cadmium	4.4E-06	6.7E-04	1.5E-06	2.9E-04
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	4.2E-06	6.4E-04	1.4E-06	2.7E-04
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.3E-05	2.0E-03	4.5E-06	8.7E-04
Nickel	1.7E-06	1.3E-03	5.7E-07	5.5E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	7.8E-06	1.2E-03	2.7E-06	5.1E-04
Silver	5.1E-06	1.3E-03	1.7E-06	5.5E-04
Thallium	ND	ND	ND	ND
Vanadium	2.6E-05	3.9E-03	8.7E-06	1.7E-03
Zinc	ND	ND	ND	ND
OW-5D				
Aluminum	8.5E-05	1.3E-02	2.9E-05	5.5E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	1.1E-06	1.6E-04	3.6E-07	6.8E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	6.3E-06	9.6E-04	2.1E-06	4.1E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.0E-05	3.0E-03	6.8E-06	1.3E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	3.0E-05	4.6E-03	1.0E-05	2.0E-03
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PE-1				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	8.4E-05	6.4E-03	2.9E-05	2.7E-03
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
PGE-6				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.0E-03	7.6E-02	3.4E-04	3.2E-02
Cobalt	NS	NS	NS	NS
Copper	6.1E-06	9.2E-04	2.1E-06	3.9E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND
Nickel	5.3E-07	4.0E-04	1.8E-07	1.7E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	1.7E-04	4.3E-02	5.8E-05	1.8E-02

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PGE-7				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	4.7E-03	3.6E-01	1.6E-03	1.5E-01
Cobalt	NS	NS	NS	NS
Copper	8.1E-06	1.2E-03	2.7E-06	5.3E-04
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	2.4E-05	3.6E-03	8.0E-06	1.5E-03
Nickel	6.5E-07	4.9E-04	2.2E-07	2.1E-04
Nitrate as nitrogen	4.4E-03	6.6E-01	1.5E-03	2.8E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	1.3E-05	3.3E-03	4.5E-06	1.4E-03
PGE-8				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	NS	NS	NS	NS
Molybdenum	3.3E-05	5.0E-03	1.1E-05	2.1E-03
Nickel	1.1E-06	8.5E-04	3.8E-07	3.6E-04
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND
Zinc	7.8E-05	2.0E-02	2.7E-05	8.5E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
Park Moabi-4				
Aluminum	NS	NS	NS	NS
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	1.1E-02	1.7E+00	3.7E-03	7.1E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	1.5E-04	3.9E-02	5.2E-05	1.7E-02
PT-1D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.6E-03	2.0E-01	8.8E-04	8.4E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-2D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.9E-03	1.5E-01	6.6E-04	6.3E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
PT-3D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	3.7E-03	2.8E-01	1.3E-03	1.2E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-4D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	5.0E-03	3.8E-01	1.7E-03	1.6E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
PT-5D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	5.2E-03	3.9E-01	1.8E-03	1.7E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-6D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.8E-03	2.1E-01	9.5E-04	9.1E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
PT-7S				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.0E-03	7.7E-02	3.4E-04	3.3E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	9.3E-03	1.4E+00	3.1E-03	6.0E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-7M				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.0E-03	1.5E-01	6.6E-04	6.4E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.1E-02	1.6E+00	3.6E-03	6.9E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
PT-7D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	6.1E-03	4.6E-01	2.1E-03	2.0E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	3.1E-03	4.7E-01	1.1E-03	2.0E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-8S				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.5E-03	1.1E-01	5.0E-04	4.8E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.1E-02	1.6E+00	3.6E-03	6.9E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
PT-8M				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	3.3E-03	2.5E-01	1.1E-03	1.1E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.3E-02	2.0E+00	4.5E-03	8.7E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-8D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	5.5E-03	4.2E-01	1.9E-03	1.8E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	4.1E-03	6.2E-01	1.4E-03	2.7E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
PT-9S				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.0E-03	7.5E-02	3.4E-04	3.2E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	6.9E-03	1.0E+00	2.3E-03	4.5E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PT-9M				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.0E-03	1.5E-01	6.7E-04	6.4E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.0E-02	1.6E+00	3.5E-03	6.7E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
PT-9D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	1.3E-02	1.0E+00	4.5E-03	4.3E-01
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	3.9E-03	5.9E-01	1.3E-03	2.5E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PTI-1D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.8E-03	2.1E-01	9.6E-04	9.2E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
PTR-1				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	4.5E-04	3.4E-02	1.5E-04	1.5E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	7.8E-03	1.2E+00	2.6E-03	5.0E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
PTR-2				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.7E-03	2.0E-01	9.1E-04	8.7E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	1.1E-02	1.6E+00	3.7E-03	7.1E-01
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
TW-1				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	3.9E-03	2.9E-01	1.3E-03	1.3E-01
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.3E-03	3.5E-01	7.8E-04	1.5E-01
Selenium	6.5E-05	9.9E-03	2.2E-05	4.2E-03
Silver	2.2E-05	5.6E-03	7.5E-06	2.4E-03
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	2.8E-05	7.0E-03	9.4E-06	3.0E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
TW-2S				
Aluminum	5.9E-05	9.0E-03	2.0E-05	3.9E-03
Antimony	6.5E-05	9.8E-03	2.2E-05	4.2E-03
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	4.1E-03	3.1E-01	1.4E-03	1.3E-01
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	2.8E-03	4.3E-01	9.6E-04	1.8E-01
Selenium	8.4E-06	1.3E-03	2.9E-06	5.5E-04
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	5.5E-05	1.4E-02	1.9E-05	5.9E-03
TW-2D				
Aluminum	ND	ND	ND	ND
Antimony	6.5E-05	9.9E-03	2.2E-05	4.2E-03
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	4.6E-03	3.5E-01	1.6E-03	1.5E-01
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.1E-05	3.2E-03	7.2E-06	1.4E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
TW-3D				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	2.4E-03	1.8E-01	8.1E-04	7.8E-02
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS
TW-4				
Aluminum	NS	NS	NS	NS
Antimony	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS
Barium	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS
Chromium, hexavalent	3.0E-05	2.3E-03	1.0E-05	9.7E-04
Cobalt	NS	NS	NS	NS
Copper	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS
Mercury	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS
Nickel	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	NS	NS	NS	NS
Silver	NS	NS	NS	NS
Thallium	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS
Zinc	NS	NS	NS	NS

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-1M				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	4.1E-05	6.2E-03	1.4E-05	2.7E-03
Zinc	6.3E-05	1.6E-02	2.1E-05	6.8E-03
CW-1D				
Aluminum	5.0E-05	7.5E-03	1.7E-05	3.2E-03
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	1.0E-06	1.5E-04	3.4E-07	6.6E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.7E-05	2.6E-03	5.8E-06	1.1E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	3.8E-05	5.7E-03	1.3E-05	2.4E-03
Zinc	2.9E-05	7.2E-03	9.7E-06	3.1E-03

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-2M				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	5.2E-05	7.9E-03	1.8E-05	3.4E-03
Zinc	5.4E-05	1.4E-02	1.8E-05	5.9E-03
CW-2D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	1.0E-06	1.5E-04	3.4E-07	6.6E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	1.8E-03	2.8E-01	6.2E-04	1.2E-01
Mercury	ND	ND	ND	ND
Molybdenum	2.6E-05	3.9E-03	8.8E-06	1.7E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	5.1E-05	7.7E-03	1.7E-05	3.3E-03
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-3M				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	8.0E-07	1.2E-04	2.7E-07	5.2E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.3E-05	1.9E-03	4.3E-06	8.2E-04
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	1.8E-03	2.7E-01	6.1E-04	1.2E-01
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	4.1E-05	6.3E-03	1.4E-05	2.7E-03
Zinc	ND	ND	ND	ND
CW-3D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	1.0E-06	1.5E-04	3.4E-07	6.6E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	2.8E-05	4.2E-03	9.3E-06	1.8E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	5.1E-07	7.7E-05	1.7E-07	3.3E-05
Vanadium	4.9E-05	7.4E-03	1.6E-05	3.2E-03
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion
CW-4M				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	6.8E-07	1.0E-04	2.3E-07	4.4E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	9.2E-06	1.4E-03	3.1E-06	6.0E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	4.0E-05	6.1E-03	1.4E-05	2.6E-03
Zinc	ND	ND	ND	ND
CW-4D				
Aluminum	ND	ND	ND	ND
Antimony	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND
Barium	ND	ND	ND	ND
Beryllium	8.4E-07	1.3E-04	2.9E-07	5.5E-05
Cadmium	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND
Copper	6.5E-06	9.8E-04	2.2E-06	4.2E-04
Fluoride	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Molybdenum	1.8E-05	2.7E-03	6.0E-06	1.2E-03
Nickel	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND
Selenium	ND	ND	ND	ND
Silver	ND	ND	ND	ND
Thallium	ND	ND	ND	ND
Vanadium	4.6E-05	7.0E-03	1.6E-05	3.0E-03
Zinc	ND	ND	ND	ND

Table L-2. Groundwater CDIs – Well-Specific – Noncarcinogenic Effects

	Groundwater CDI – Noncarcinogenic Effects (mg/kg/d)			
	On-Site Resident Child		On-Site Resident Adult	
Chemical of Potential Concern	Dermal Contact	Ingestion	Dermal Contact	Ingestion

Notes:
CDI = chronic daily intake
mg/kg/d = milligrams per kilogram per day
ND = not detected or not detected above background concentrations
NS = not sampled

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Appendix M

Supplemental Evaluation to Address Nutritional Essentiality: Molybdenum and Selenium

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Appendix M – Supplemental Evaluation to Address Nutritional Essentiality: Molybdenum and Selenium

HERA of Groundwater Impacted by Activities at
SWMU 1/AOC 1 and SWMU 2
Topock Compressor Station, Needles, California

November 2009

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M-1 Comparison of Molybdenum Site Intake from Groundwater and Diet to the Tolerable Upper Intake Level

M-2 Comparison of Selenium Site Intake from Groundwater and Diet to the Tolerable Upper Intake Level

Acronyms and Abbreviations

CDC	Centers for Disease Control and Prevention
CSF II	Continuing Survey of Food Intakes by Individuals
DRI	Dietary Reference Intake
ESADDI	Estimated Safe and Adequate Daily Dietary Intake
FNB	Food and Nutrition Board
GWRA	groundwater risk assessment
HQ	hazard quotient
IOM	Institute of Medicine
IRIS	Integrated Risk Information System
kg	kilogram(s)
L	liter(s)
LOAEL	Lowest Observed Adverse Effect Level
mg	milligram(s)
mg/kg-bw/day	milligrams per kilogram body weight per day
NCHS	National Center for Health Statistics
NHANES III	Third National Health and Nutrition Examination Survey
NOAEL	no observed adverse effect level
NRC	National Research Council
RDA	recommended daily allowance
RfD	reference dose
SWMU	Solid Waste Management Unit
µg	microgram(s)
UL	tolerable upper intake level
USDOI	U.S. Department of the Interior
USEPA	U.S. Environmental Protection Agency
UTL	upper tolerance limit

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Appendix M

Supplemental Evaluation to Address Nutritional Essentiality: Molybdenum and Selenium

1. Introduction

This appendix to the *Human and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern 1 and SWMU 2, Topock Compressor Station, Needles, California,* (GWRA) provides a supplemental evaluation of potential hazards associated with potential exposure to the essential nutrients molybdenum and selenium for the future hypothetical groundwater user for the site. According to the U.S. Environmental Protection Agency (USEPA) *Framework for Metals Risk Assessment* (USEPA, 2007) the essentiality of metals should be viewed as part of the overall dose-response relationship, and reference doses (RfDs) should not be set below doses identified as essential. This is important when evaluating the potential health risks for essential nutrients that may also be related to site processes, to ensure that exposures aren't estimated to pose a potential risk (and communicated to individuals as such) at levels that may be nutritionally essential. This molybdenum essential nutrient evaluation, conducted in addition to the standard baseline molybdenum evaluation, is not a typical component of the California Department of Toxic Substances Control's standard risk assessment protocols, although an essential nutrient screen is not an unusual request for USDOI sites.

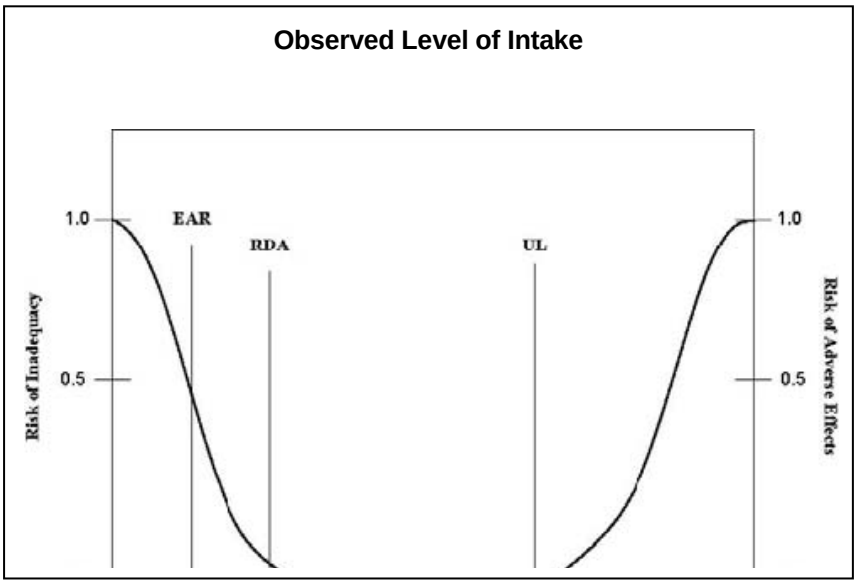
For this supplemental evaluation, site data were used to estimate intake of each of these two essential nutrients (in milligrams per day [mg/day]) from groundwater. The intake from groundwater was then added to the estimated dietary intake for each essential nutrient, and the total estimated intake of molybdenum and selenium at the site was compared to the upper intake level (UL) for each nutrient.

It is noted that all wells in the GWRA are evaluated blindly as if they could be potable wells in the future, without consideration for their location. However, there is only a portion of the site that the U.S. Department of the Interior (USDOI) has identified as having potential future residential use. Results of this supplemental evaluation are discussed with consideration of well locations and the potential for future hypothetical residential use.

2. Nutritional Essentiality for Metals Risk Assessment

According to USEPA risk assessment guidance on metals (2007) the essentiality of metals should be viewed as part of the overall dose-response relationship, and RfDs should not be set below doses identified as essential. Therefore, according to USEPA guidance on metals risk assessment (2007), molybdenum and selenium were further evaluated by considering the overall dose-response relationship and evaluating the entire dose-response relationship, from very low (inadequate) doses to high (toxic) doses, in order to determine an acceptable upper exposure limit.

The graph below shows a generic example of the relationships between potential health impacts both beneficial and adverse, and terms typically used to describe dietary criteria for any essential nutrient. The National Academy of Sciences Food and Nutrition Board (FNB) in conjunction with the Institute of Medicine (IOM) developed the Dietary Reference Intakes (DRIs) program (IOM, 2001; USEPA, 2007). These agencies reformulated the Estimated Safe and Adequate Daily Dietary Intake (ESADDI) now known as recommended daily allowances (RDAs). The terms below are used to describe critical points for the full dose response curve (typical example taken from USEPA, 2007) for an essential nutrient:



- EAR – estimated average requirements replaced adequate intakes

- RDA – recommended dietary allowance, which replaced ESADDI and represents the average daily dietary nutrient intake level sufficient to meet the nutrient requirements of nearly all health individuals in a particular life stage and gender group.

- UL – tolerable upper intake level.

The UL is the highest level of daily nutrient intake that is likely to pose no risk of adverse health effects to almost all individuals in the general population. The UL is based on similar risk models that are used by USEPA to set the RfDs and protects most of the population including sensitive subgroups (USEPA, 2007; USEPA, 1989). As with chemical agents, nutrients can produce adverse health effects in humans if their intake from a combination of food, water, nutrient supplements, and pharmacological agents is excessive. It is not possible to determine with certainty a single intake level for a nutrient that is risk free for all members of a population. However, it is possible to identify an intake level that is unlikely to result in adverse health impacts for most population members including sensitive subpopulations, something that the UL and RfD have in common (IOM, 2001; USEPA, 1989).

Use of ULs is endorsed by USEPA risk assessment guidance for metals (2007) to aid in the interpretation of site data in support of risk management decisions. USEPA Region 5 approved a site management strategy in 2005 for a site with molybdenum impacts to groundwater. The site, Northern Indiana Public Service Company and Brown, Inc., is under administrative order with USEPA and the state of Indiana to address contaminants associated with site activities that were related to coal combustion by-products. The Resource Conservation and Recovery Act Facility Investigation work plan for the Indiana site presented a site management strategy including evaluation of molybdenum in groundwater relative to the nutritional status and the UL. This work plan for the Indiana site was accepted by the agency and is currently being implemented.

3. Essential Nutrient Evaluation of Potential Molybdenum Intake

For molybdenum, this section describes the basis for the RfD, the IOM challenge to that value, and the use of the UL as an alternate method to evaluate potential hazard for estimated molybdenum intake for the future hypothetical groundwater user at Topock. Molybdenum is deemed nutritionally essential for humans as it has been shown to act as a cofactor for a limited number of enzymes in humans (IOM, 2001). In sum, the IOM, the agency tasked with evaluating essential nutrients and related dietary intake, has challenged the basis of the current Integrated Risk Information System (IRIS) RfD (USEPA, 2009a) and presents a UL that is above the current RfD (IOM, 2001).

3.1 USEPA IRIS Reference Dose for Molybdenum

The RfD established for molybdenum in 1993 and listed in IRIS cites three human studies (Kovalsky et al., 1961; Deosthale and Gopalan, 1974; and USEPA, 1979). The primary quantitative basis of the RfD is an epidemiologic study of a population in a province of Armenia characterized by high molybdenum content in the soil and low copper content (Kovalsky et al., 1961). The exposure period was from 6 years to a lifetime. The average adult person in the region was estimated to have a daily intake of 10 to 15 milligrams (mg) of molybdenum, and 5 to 10 mg of copper. This intake corresponds to molybdenum doses of 0.14 to 0.21 milligrams per kilogram body weight per day (mg/kg-bw/day) for a 70-kilogram (kg) adult. Control area intake values were 1 to 2 mg molybdenum and 10 to 15 mg copper. Based on the increased serum ceruloplasmin and urinary excretion of copper observed, USEPA determined that high levels of ingested molybdenum may be associated with potential mineral imbalance (USEPA, 2009a). USEPA determined that excretion of sufficient quantities of this element may put individuals at risk for the hypochromic microcytic anemia associated with a dietary copper deficiency (USEPA, 2009a). Based on the results of the Kovalsky et al. study (1961), USEPA determined that a molybdenum intake of 0.14 mg/kg-bw/day may result in serum uric acid levels elevated above the average range of the adult population and designated this level as a lowest observed adverse effect level (LOAEL). The LOAEL was divided by an uncertainty factor of 3 for protection of sensitive human populations and an uncertainty factor of 10 for the use of a LOAEL, rather than a no observed adverse effect level (NOAEL), from a long-term study in a human population (total uncertainty factor of 30), resulting in a RfD of 0.005 mg/kg-bw/day.

USEPA acknowledged in 1993 that increased copper excretion and elevated serum ceruloplasmin are not definitive adverse effects and no "frank" adverse effects were identified in the human studies cited. However, by virtue of the potential for mineral imbalance to occur, the RfD was established at a level similar to the ESADDI (National Research Council [NRC], 1989), a level established based on studies of the average American dietary intake (NRC, 1989), not on adverse health impacts. Thus, the RfD established by USEPA for molybdenum is not based on definitive adverse effects.

The current oral RfD for molybdenum is set at 0.005 mg/kg-bw/day, which also can be expressed as an allowable intake of 0.35 mg/day for adults, a value obtained by multiplying the RfD by body weight (i.e., 70 kg for an adult). The table below presents the RfD expressed as a daily intake along with the corresponding ESADDI available in 1993 when the RfD was developed. These ESADDI values are outdated and have been replaced by RDAs (IOM, 2001):

Receptors	Body Weight (kg)	Molybdenum RfD Intake (mg/day)	Molybdenum ESADDI (mg/day)
Adults (>19 years)	70	0.35	0.25
Child (4-9 years)	15	0.075	0.15
Child (1-3 years)	10	0.05	0.025

It should be noted that USEPA established the RfD at a level similar to the ESADDI based on the average American diet as it was understood at that time. As stated by USEPA (2009a), the ESADDI is not associated with any definitive adverse health effect. Further, the USEPA (USEPA, 2009a) had concerns that high levels of ingested molybdenum may be associated with potential mineral imbalance (e.g., copper depletion) based on the Kovalsky et al. study (1961). Thus, the RfD for molybdenum was set close to the ESADDI. This concern for relationship between copper and molybdenum intake was part of the rationale for selecting the Kovalsky et al. study (1961) as the basis for the RfD. The IRIS profile states:

> "it is important to note that the average level of copper intake in the American population from 1982 to 1986 was less than the lower limit of the ESADDI recommendation for all age and sex groups studied in the Food and Drug Administration (FDA) Total Diet Study (Pennington et al., 1989)"

To provide perspective on that statement in the IRIS profile, ARCADIS reviewed more current dietary intake information for copper. Dietary intake information for copper summarized in the table below was obtained from nutrition surveys and food intake studies to include the Third National Health and Nutrition Examination Survey (NHANES III) and the Continuing Survey of Food Intakes by Individuals (CSF II) (Centers for Disease Control and Prevention [CDC], 2009). The NHANES III is a program of studies designed to assess the health and nutritional status of adults and children in the United States and is a major program of the National Center for Health Statistics (NCHS). NCHS is part of the CDC and has the responsibility for producing vital and health statistics for the Nation. The CSF II was conducted in response to the Food Quality Protection Act of 1996, which required the U. S. Department of Agriculture to provide data from a larger sample of children for use by USEPA in estimating exposure to pesticide residues in the diets of children.

Copper Dietary Intake Data from Nutrition Surveys

Age (years)	Dietary Intake NHANES III (1988-1994)	CSF II (1994-1996)	RDA (IOM, 2001)
1-3	0.74	0.71	0.340
3-8	0.97	0.88	0.440
14-18 male	1.5	1.45	0.890
14-18 female	1.1	1.07	0.890
19-30 male	1.7	1.52	0.900
19-30 female	1.2	1.05	0.900

The intake data indicate that the average copper intake in the American diet is now above the RDA (IOM, 2001). This indicates that most individual's diets exceed the RDA, which is the average daily nutrient intake level sufficient to meet the nutrient requirements of nearly all (97 to 98%) of healthy individuals in a particular life stage and gender group.

This updated dietary intake information indicates that the American population is receiving adequate dietary copper.

3.2 Molybdenum Tolerable Upper Intake Level (UL)

The IOM reviewed the information on essential nutrients as it developed the DRI program and all associated values. The DRI profile for molybdenum (IOM, 2001) challenges the basis of the IRIS 1993 RfD (USEPA, 2009a). The adverse effects of molybdenum in the Kovalsky et al. study (1961) reflect the synergistic conditions of high molybdenum intake combined with low copper intake of the exposed population. Laboratory animal studies showed that the effects of molybdenum on growth and melanin synthesis are more pronounced under situations where dietary copper intake is low (USEPA, 2009a). Impaired copper utilization has also been observed in ruminants (Mills and Davis, 1987; as cited in IOM, 2001), but the digestive system differences for humans make this data not applicable. A study of a second population from an area where soil molybdenum concentrations were high but where copper intake was also high, showed no indication of elevated uric acid levels or increased incidences of gout-like disorders (Mertz, 1976). Another criticism of the Kovalsky et al. study (1961) is that there were serious methodological problems, including possible analytical difficulties in the assessment of blood and urinary copper levels, and the very small size of the control group compared to the group exposed to molybdenum (IOM, 2001). The IOM notes that other more recent human studies of exposure to molybdenum do not support the Kovalsky et al. (1961) results. In fact, the studies also cited in the development of the oral RfD for molybdenum (USEPA, 1979; Deosthale and Gopalan, 1974), do not support the manifestation of increased uric acid in plasma and urine with increased molybdenum exposure.

In summary, because of the weaknesses in the Kovalsky et al. study (1961), the IOM has determined that inadequate data exist to identify a causal association between excess molybdenum intake in normal, apparently healthy individuals and any adverse health outcomes (IOM, 2001). In addition, results of other studies have identified levels of dietary molybdenum intake that appear to be associated with no harm (Deosthale and Gopalan, 1974; Turnlund and Keyes, 2000; as cited in IOM, 2001). The UL for molybdenum is unique in that there were no human studies available that identified distinct adverse health effects associated with dietary ingestion of molybdenum. As a result, a UL was established using the same approach used by USEPA in establishing an RfD for nutritionally essential elements, focusing on dietary studies that resulted in adverse effects at levels above those deemed nutritionally essential to humans.

According to the IOM a number of dietary studies with mice, rats, rabbits, and guinea pigs have demonstrated reproductive effects from molybdenum intake (Jeter and Davis, 1954; Schroeder and Mitchener, 1971; Fungwe et al., 1990). In addition, a

recent human study has produced results that are consistent with the findings from animal studies, where the effects of molybdenum on reproduction has been evidenced based on observing an inverse association between molybdenum in blood and semen quality (Meeker et al., 2008). The study did not have a dietary component and due to the high percentage of blood samples that were below detection did not allow for the establishment of dose-response relationships and metal-metal interactions. Therefore, for this evaluation the dose-response information obtained from animal studies was used. The effects of molybdenum on reproduction and fetal development in rats and mice were determined to be the most sensitive and the basis for developing the UL. The study from Fungwe et al. (1990) provides the dose-response relationship for adverse reproductive effects in female rats. The NOAEL was established at 0.9 mg/kg-bw/day. Based on the same guidance in developing an RfD, the same uncertainty factors used in establishing RfDs were also applied to develop the UL. An uncertainty factor of 10 was applied to account for extrapolating from animal studies to humans, and another factor of 3 was applied to address intraspecies differences resulting in a UL of 0.03 mg/kg-bw/day. Therefore, the UL is considered to be protective of the most sensitive members of the general population from adverse effects of high nutrient intake. This UL was also expressed as an allowable intake of 2 mg/day for adults, a value obtained by multiplying the UL dose by body weight (i.e., 70 kg for an adult) and the corresponding values for children are presented in the table below along with the RfD expressed as a daily intake based on body weight for the receptor:

Receptors	Body Weight (kg)	Molybdenum UL (mg/day)	Molybdenum RfD (mg/day)
Adults	70	2	0.35
Child (1-3 years)	10	0.3	0.075
Child (4-8 years)	15	0.6	0.05

Because both the RfD and UL represent estimates of the upper level at which there are not likely to be adverse health effects in the general population to include sensitive individuals, these values would be expected to be in the same range. In the case of molybdenum, the uncertainty factor is the same in both cases – 30; however, the difference is in the studies used as the basis for the value.

Goldhaber (2003) states that many RfDs currently being used were set years ago and need to be updated based upon the newer data that has since become available and used to set the ULs and RDAs. Given the relevant data (Fungwe et al., 1990; Meeker et al., 2008; Jeter and Davis, 1954; Schroeder and Mitchener, 1971) not considered by

the IRIS RfD, and the adequacy of copper in the American diet, the UL for molybdenum is more appropriate to use than the RfD to assess the safety of site data. [Note: the 1993 IRIS profile states that there were no reproductive or developmental studies in the database for molybdenum. In addition, the screening-level literature review conducted by an USEPA contractor in August 2003 as a re-evaluation of the toxicity of molybdenum did not identify the following studies that were considered by the IOM evaluation of molybdenum: Fungwe et al., 1990; Jeter and Davis, 1954 ; Schroeder and Mitchener, 1971; or Turnlund and Keyes, 2000.]

3.3 Contributions of Molybdenum from Diet

Information on dietary intake of molybdenum is limited because of lack of a simple, reliable analytical method for measuring molybdenum in food. As a result, dietary data from the NHANES III and CSF II studies are not currently available for molybdenum. Therefore, the available scientific literature was reviewed to locate information regarding the daily intake of molybdenum from the diet. One U.S. study has reported intakes ranging from 120 to 240 micrograms per day (µg/day), with an average of 180 µg/day for all age groups (Tsongas et al., 1980). Another total diet study indicates an average molybdenum intake of 76 µg/day for women and 109 µg/day for men (Pennington and Jones, 1987). In 1989, the FNB of the Subcommittee on the Tenth Edition of the Recommended Dietary Allowances (RDAs) established ESADDI values for molybdenum (NRC, 1989) using these average American diet studies as a basis. As described above, ESADDIs set in 1989 were replaced in the DRI document by RDAs developed by the FNB of the Institute of Medicine (IOM, 2001), a branch of the National Academy of Sciences.

The values shown below represent the molybdenum nutritional RDA and UL amounts (IOM, 2001), and the dietary intakes are the levels of molybdenum that are obtained from an average American diet (Tsongas et al., 1980).

Age	Molybdenum Daily Dietary Intake (Tsongas et al., 1980)	Molybdenum RDA (IOM, 2001)	Molybdenum UL (IOM, 2001)
Child (1-3 years)	0.13	0.017	0.3
Child (4-8 years)	0.15	0.022	0.6
Adult	0.25	0.045	2.0

The UL, which is the highest level of daily nutrient intake that is likely to pose no risk of adverse health effects for almost all individuals in the specified life stage group, was used as the total acceptable molybdenum intake level. This UL can then be compared to an estimated total intake of molybdenum at the site, inclusive of diet and site groundwater as the only source of potable drinking water.

3.4 Estimation of Molybdenum Intake for Topock

Based on the results of the GWRA using the USEPA RfD, six wells of the wells sampled for molybdenum resulted in estimated noncarcinogenic hazard quotients (HQs) greater than 1.0 (calculated without considering contributions from the diet). The estimated HQs at these wells ranged from 1.1 to 2.5, and were calculated using the USEPA RfD established in 1993. However, molybdenum is classified as a nutritionally essential metal in the human diet; therefore, according to USEPA's *Framework for Metals Risk Assessment* (2007), essentiality must be considered in the overall dose-response relationship.

The USEPA senior toxicologist serving as the compound manager for molybdenum toxicity evaluations was consulted directly to determine the agency's view of using the IRIS oral RfD for molybdenum versus the UL for hazard estimates. USEPA's advice was that the oral RfD listed in IRIS is indeed flawed as indicated in the IOM document, and that the UL provides a better indication of potential health concerns for molybdenum hazard (Donohue, personal communication 2009).

To place site groundwater data for Topock into a proper health perspective for essential nutrient evaluation, the total intake of molybdenum from site groundwater and estimated molybdenum intake from the diet were combined. This estimated total intake was then compared to acceptable intake levels for molybdenum based on the UL dose as presented by the IOM (2001).

The UL was identified as the most relevant upper intake level for use in interpreting the Topock molybdenum data, because it is the highest level of daily nutrient intake that is likely to pose no risk of adverse health effects for almost all individuals in the specified life stage group to include the most sensitive members of the general population.

Table M-1 presents an estimate of the chronic daily intake of molybdenum for the hypothetical groundwater user as well as exposure point concentrations from each Topock well (see GWRA Table 4-2) where molybdenum was determined to be present above the background upper tolerance limit (UTL). This concentration was multiplied

by USEPA's default groundwater ingestion rate for the future hypothetical groundwater users (adult 2 liters per day [L/day] and child 1 L/day taken from GWRA Table 5-1) to give the estimated molybdenum intake in mg/day for each well. Note, dermal exposure intake of molybdenum from groundwater at the site was two orders of magnitude lower than ingestion exposure intake; therefore, dermal exposure did not contribute significantly to the overall intake and is not evaluated here.

To conservatively estimate additional intake of molybdenum from the diet, the upper end of the ranges for adult, child (1 to 3 years), and child (4 to 8 years) shown in the last table above were used. The sum of the daily intake of molybdenum from site groundwater and the diet represents the estimated total intake of molybdenum for the hypothetical groundwater users for each well.

The UL for each age group as shown on the last table above was compared to the total estimated intake, inclusive of intake from ingestion of groundwater and the diet. The total estimated intakes for all wells, plus the dietary contribution for both the adult and child hypothetical groundwater user are at or below the UL in all but one case. The use of data for MW-46-175 results in an estimated intake of 0.330 mg/day of molybdenum compared to the UL for the child (1 to 3 years) of 0.300 mg/day. This is a ratio of 1.1 if the intake is divided by the UL. MW-46-175 is located north of the I-40 corridor, near the Colorado River, on the USDOI parcel identified for potential future residential use. All other wells and ages had estimated intakes below the corresponding UL.

Based on more current dose-response information and consideration of daily contributions of molybdenum from the diet, the total molybdenum exposure from site groundwater and diet are, with one exception below the highest levels of daily nutrient intake that are likely to pose no risk of adverse health effects for almost all individuals in the specified life stage group.

4. Essential Nutrient Evaluation of Potential Selenium Intake

For selenium, this section describes the basis for the RfD, the UL for selenium, and the use of the UL as an alternate method to evaluate potential hazard for estimated selenium intake for the future hypothetical groundwater user at Topock.

Selenium functions primarily in association with proteins known as selenoproteins. It is deemed nutritionally essential for humans because the absence of selenium disrupts synthesis of selenoproteins, which is lethal for embryos. Selenium is known to be important for the following known biological functions: defense against oxidative stress, regulation of thyroid hormone action, and regulation of the redox status of vitamin C and other molecules (IOM, 2001).

4.1 USEPA IRIS Reference Dose for Selenium

The RfD established for selenium in 1991 and listed in USEPA's IRIS is based on human studies; the selenium profile was last updated by USEPA in 1993. The following paragraphs summarize the information and studies that form the basis of the RfD (USEPA, 2009b).

The principal support study was conducted by Yang et al. (1989b), which studied safe maximal daily dietary selenium-intake in a seleniferous area in China. This epidemiologic study involved a population of approximately 400 individuals living in an area of China with unusually high environmental concentrations of selenium. The subjects were evaluated for clinical and biochemical signs of selenium intoxication. Three geographical areas with low, medium, and high selenium levels in the soil and food supply were chosen for comparison in the studies (Yang et al., 1989b). Yang et al. (1989a,b) determined that selenium levels in soil and approximately 30 typical food types commonly eaten by the exposed population showed a positive correlation with blood and tissue selenium levels. The daily average selenium intake based on lifetime exposure, were 70, 195, and 1,438 µg for adult males and 62, 198, and 1238 µg for adult females in the low-, medium- and high-selenium areas, respectively (USEPA, 2009b). In addition, significant correlations demonstrated between selenium concentrations of various tissues were used to estimate the minimal daily selenium intake values that elicited various alterations in biochemical parameters indicative of possible selenium-induced liver dysfunction (i.e., prolongation of clotting time and serum glutathione titer) and clinical signs of selenosis (e.g., hair or nail loss and morphological changes of the nails).

Analysis of the results indicated that persistent clinical signs of selenosis were observed only in five of the 349 adults, and identified these five adults as a potentially sensitive subpopulation (USEPA, 2009b). Clinical signs observed included the characteristic "garlic odor" of excess selenium excretion in the breath and urine, thickened and brittle nails, hair and nail loss, lowered hemoglobin levels, mottled teeth, skin lesions, and central nervous system abnormalities (USEPA, 2009b). Alterations in the measured biochemical parameters occurred at dietary intake levels of 750 to 850 µg/day (i.e., increase in blood coagulation time and reduction in blood glutathione concentration) (USEPA, 2009b). However, these indicators were poorly characterized and are not typically used as an index for clinical selenosis resulting from chronic exposure to selenium (USEPA, 2009b). Based upon the blood selenium levels shown to reflect clinical signs of selenium intoxication, a whole-blood selenium concentration corresponding to 1,261 µg/day selenium intake was deemed indicative of the lowest correlative selenium intake causing overt signs of selenosis (USEPA, 2009b). The next lowest whole-blood selenium concentration corresponding to 853 µg/day, produced no clinical signs of selenosis (USEPA, 2009b).

A study by Longnecker et al. (1991) involved 142 volunteers in South Dakota and Wyoming randomly recruited from households listed in a telephone directory or from ranches with suspected high selenium intake based on previous cases of livestock selenosis (USEPA, 2009b). The subjects were followed for one year and completed health questionnaires; underwent physical examinations; provided blood samples for clinical assessment; and provided samples of blood, urine, toenails, and duplicate-plate food collections for selenium analysis. The average selenium intake was 239 µg/day, approximately two to three times higher than the national average. The concentration of selenium in whole blood, serum, urine, and toenails and the amount in diet were highly correlated. Blood selenium concentration was highly correlated with selenium intake. The correlation was very similar to that reported by Yang et al. (1989a); however, liver function, hematologic function, and clinical chemistry were not found to be altered as a result of selenium intake (USEPA, 2009b). High regression coefficient predictor variables for selenium toxicity were not found in increased frequency for this population, and there were no signs of selenium toxicity found in the population, including individuals whose selenium intake was as high as 724 µg/day.

Based on the results of the Yang et al. study (1989a,b) a selenium NOAEL of 853 µg/day, and the selenium LOAEL of 1260 µg/day was determined by USEPA. USEPA established the RfD based on the NOAEL adjusted for body weight in the study and applying an uncertainty factor of 3 (NOAEL = 0.853 mg/day / 55 kg x 1/3) to arrive at an oral RfD of 0.00516 mg/kg-bw/day. An uncertainty factor of 3 was applied to the

NOAEL to account for sensitive individuals instead of a full factor of 10, because similar NOAELs were identified in two moderately sized human populations exposed to selenium levels in excess of the RDA throughout a lifetime without apparent clinical signs of selenosis. Thus, the resulting RfD was established by USEPA of 0.005 mg/kg-bw/day, which equates to a selenium daily intake of 284 µg/day for a 55 kg adult. It should be noted, however, that the Longnecker et al. (1991) study corroborates that of Yang et al. (1989b), which showed that a selenium intake of up to 853 µg/day is not associated with characteristics of selenosis.

Essential nutrient intake is typically expressed as mg/day for a certain age group. In order to compare the health protective intake represented by the RfD to essential nutrient intake information, the RfD was used to calculate the related health protective daily intake for adults and children. The current oral RfD for selenium is set at 0.005 mg/kg-bw/day, which also can be expressed as an allowable daily intake of 284 µg/day for adults, a value obtained by multiplying the RfD by the adult body weight in the study (i.e., 55 kg). The RfD-based intake shown below for children was calculated the same as for the adult, except standard default assumptions of body weight for children were used as identified below. The RfD expressed as a daily intake along with the corresponding RDA are presented in the table below to compare the levels associated with no adverse health effects (RfD) versus the levels required in the diet (RDA):

Receptors	Body Weight (kg)	Selenium RfD Intake (mg/day)	Selenium RDA (mg/day)
Adults (>19 years)	55	0.284	0.055
Child (4-8 years)	15	0.077	0.030
Child (1-3 years)	10	0.052	0.020

4.2 Tolerable Upper Intake Level (UL)

The IOM reviewed the information on essential nutrients as it developed the DRI program and all associated values. The DRI profile for selenium (IOM, 2000) for establishing a UL for an adult is consistent with the basis of the IRIS 1993 RfD (USEPA, 2009b), except an uncertainty factor of 2 was applied to the NOAEL by IOM (2000) to develop a UL that is protective of sensitive individual adults instead of an uncertainty factor of 3 that USEPA applies for ensuring protection of sensitive receptors. The UL for adults was determined to be 400 µg/day (IOM, 2000).

The UL for children was based on a different epidemiologic study than that applied for the adult UL. For the child UL, IOM established a UL for a child (1 to 3 years) and a child (4 to 8 years) by using a study from Shearer and Hadjimarkos (1975), which showed that a human milk selenium concentration of 60 micrograms per liter (µg/L) was not associated with known adverse effects. Thus, the NOAEL for this study of 7 micrograms per kilogram per day (µg/kg/day) was adjusted for older infants and children based on body weight to arrive at ULs of 90 µg/day and 150 µg/day for children of 1 to 3 years and children of 4 to 8 years, respectively. It should be noted that this represents the upper NOAEL identified in this study; a LOAEL was not identified (Levander et al., 1987). This introduces the uncertainty that the actual health protective dose could be higher than the UL. Further, there is no known evidence indicating an age-related sensitivity to selenium toxicity (IOM, 2000).

In summary, although the USEPA-established RfD was based on a NOAEL for a sensitive population in the Yang et al. study (1989b) of 853 µg/day, USEPA still applied an uncertainty factor of 3 to further protect sensitive individuals to arrive at a daily intake of 284 µg/day. The IOM used the same study, Yang et al. (1989b), and identified an NOAEL daily intake of 800 µg/day and applied an uncertainty factor of 2 to address sensitive individuals to arrive at a UL of 400 µg/day versus the daily intake of 284 µg/day. Thus, the daily intake based on the RfD of 284 µg/day is lower but within the same order of magnitude as the UL of 400 µg/day.

Receptors	Body Weight (kg)	Selenium UL (mg/day)	Selenium RfD (mg/day)
Adults (>19 years)	55	0.4	0.284
Child (4-8 years)	15	0.15	0.052
Child (1-3 years)	10	0.09	0.077

Because both the RfD and UL represent estimates of the upper level at which there are not likely to be adverse health effects in the general population to include sensitive individuals, these values would be expected to be in the same range. In the case of selenium, the difference is the uncertainty factor for the adult values where an uncertainty factor of 2 was used for the UL and an uncertainty factor of 3 was used for the RfD; the basis for the child values is the difference in studies used.

4.3 Contributions of Selenium from Diet

Dietary intake of selenium varies tremendously among different populations due to factors that affect intake including the geographic origin of the food items and the meat content of the diet (IOM, 2000). Selenium intake in the United States has been estimated in several studies. A Maryland study indicated that selenium intake of 22 residents was 81 +/- 41 (standard deviation) µg/day (IOM, 2000). A study by the FDA (1995) analyzed food items purchased in different regions of the United States and calculated dietary selenium intake; median calculated intakes ranged from 79 µg/day to 104 µg/day (IOM, 2000). NHANES III intake data reported a higher median selenium intake of 106 µg/day from food for all individuals; the mean dietary intake for children 1 to 3 years of age is 65.5 µg/day, children 4 to 8 years of age is 86.8 µg/day, and highest adult mean is for males of 159 µg/day (IOM, 2000).

The values shown below represent the selenium nutritional RDA and UL amounts (IOM, 2000), and the dietary intakes are the levels of selenium that are obtained from an NHANES III.

Age	Selenium Daily Dietary Intake (CDC, 2009; NHANES) (mg/day)	Selenium RDA (IOM, 2000) (mg/day)	Selenium UL (IOM, 2000) (mg/day)	Selenium RfD Intake Level (mg/day)
Chile (1-3 years)	0.0655	0.020	0.09	0.007
Child (4-8 years)	0.0868	0.030	0.15	0.052
Adult	0.159	0.055	0.4	0.284

The UL, which is the highest level of daily nutrient intake that is likely to pose no risk of adverse health effects for almost all individuals in the specified life stage group, was used as the total acceptable selenium intake level. This UL can then be compared to an estimated total intake of selenium at the site, inclusive of diet and site groundwater as the only source of potable drinking water.

4.4 Estimation of Selenium Intake for Topock

Based on the results of the GWRA using the USEPA RfD, one well of the wells sampled for selenium resulted in an estimated noncarcinogenic HQ greater than 1.0 (calculated without considering contributions from the diet). The estimated HQs for the hypothetical child groundwater user at TW-1 was 2.0 calculated using the USEPA RfD.

However, selenium is classified as a nutritionally essential metal in the human diet; therefore, according to USEPA Framework for Metals Risk Assessment (2007), essentiality must be considered in the overall dose-response relationship.

To place site groundwater data for Topock into a proper health perspective, the total intake of selenium from site groundwater and estimated selenium intake from the diet were compared to total acceptable intake levels based on the UL dose as presented by the IOM (2001).

This supplemental selenium evaluation considered the overall dose-response relationship and evaluated the entire dose-response relationship, from very low (inadequate) doses to high (toxic) doses in order to determine an acceptable upper exposure limit. As summarized above, the UL was used in interpreting the Topock selenium data because it is the highest level of daily nutrient intake that is likely to pose no risk of adverse health effects for almost all individuals in the specified life stage group to include the most sensitive members of the general population.

Table M-2 presents an estimate of the chronic daily intake of selenium for the hypothetical groundwater user as well as exposure point concentrations from each Topock well (see GWRA Table 4-2) where selenium was determined to be present above the background UTL. This concentration was multiplied by USEPA's default groundwater ingestion rate for the future hypothetical groundwater users (adult 2 L/day and child 1 L/day taken from GWRA Table 5-1) to give the estimated selenium intake in mg/day for each well. Note, dermal exposure intake of selenium from groundwater at the site was two orders of magnitude lower than ingestion exposure intake; thus, dermal exposure did not contribute significantly to the overall intake and is not evaluated here.

To conservatively estimate additional intake of selenium from the diet, the upper end of the ranges for adult, child (1 to 3 years), and child (4 to 8 years) shown in Table M-2 were used. The sum of the daily intake of selenium from site groundwater and the diet represents the estimated total intake of selenium for the hypothetical groundwater users for each well.

The UL for each age group as shown on Table M-2 was compared to the total estimated intake, inclusive of intake from ingestion of groundwater and the diet. The total estimated intakes for all wells plus the dietary contribution for the adult hypothetical groundwater user are at or below the UL in all but one case, TW-1. The total estimated intakes for all wells plus the dietary contribution for the child

hypothetical groundwater user are at or below the UL in all but three cases, TW-1, and MW-21 and MW-24A for the child 1 to 3 years of age. The use of data for TW-1 results in an estimated intake of 0.479 mg/day of selenium for the adult compared to the UL of 0.400 mg/day, resulting in a ratio of 1.2. For the child 4 to 8 years of age and TW-1 data, the estimated intake is 0.247 mg/day compared to the UL of 0.150 mg/day, resulting in a ratio of 1.6. For the child 1 to 3 years of age and TW-1, the estimated intake is 0.226 mg/day compared to the UL of 0 09 mg/day, resulting in a ratio of 2.5. Dividing the estimated intake by the UL for wells MW-21 and MW-24A give ratios of 1.2 and 1.3, respectively, for the child 1 to 3 years of age. It is noted that all three wells (MW-21, MW-24A, and TW-1) are located south of the I-40 corridor. Therefore, none are located on the parcel identified by USDOI as an area for potential future residential use. All other wells and ages had estimated total intakes below the corresponding UL for selenium.

The estimated intake of selenium from groundwater is below the highest levels of daily nutrient intake that are likely to pose no risk of adverse health effects for almost all individuals. When estimated dietary intake is added to the estimated groundwater intake, the UL is exceeded for all three evaluated age groups for one well, TW-1, with the highest ratio being 2.5 for the child 1 to 3 years of age. The total intake is dominated by the dietary intake component. As was discussed above, the ULs or the child receptors were developed from an epidemiology study where no adverse dose was observed. The UL is based on the highest estimated exposure which is a NOAEL. A LOAEL was not identified for this study. Consequently, the safe allowable daily intake may be above the UL. This perspective is important because it is this uncertainty that indicates the exceedances of the UL for the child 1 to 3 years of age in wells MW-21 and MW-24A likely overestimate the potential health concern. In addition, as discussed above, there is no indication of an age-related sensitivity to selenium. The results for this supplemental evaluation of essential nutrient status for TW-1 are comparable to the findings in the risk assessment. TW-1 is the same well that produced a hazard index value of 2.0. It is noted that TW-1 is just outside the fenceline of the compressor station and located on Pacific Gas and Electric Company property. This location is not part of the parcel identified by USDOI as an area for potential future residential use.

There is only one well slightly above the UL for selenium for all age groups when both dietary and potential groundwater consumption are combined for selenium. This well is not on the USDOI parcel identified for potential future residential use. Consequently, it is unlikely that selenium in groundwater at the Topock site presents a risk of adverse health effects.

5. Conclusions

The following conclusions are based on the information and analysis described above:

5.1 Molybdenum

- The USEPA RfD for molybdenum is overly conservative given more recent relevant human and animal studies.

- The adverse effects of molybdenum in the study that is the basis of the USEPA RfD reflect the synergistic conditions of high molybdenum intake combined with low copper intake of the exposed population.

- The average American dietary intake of copper is estimated to be nutritionally adequate according to the NHANES III and CSF II diet studies, which are more recent than NHANES II information referenced in USEPA 2009a.

- Consistent with USEPA guidance for metals risk assessment, DRI UL values should be considered in evaluating the potential health impacts associated with future hypothetical exposures to molybdenum in site groundwater.

- Total estimated intakes of molybdenum, including hypothetical domestic use of the groundwater and reasonable assumptions regarding dietary intake, are at or below safe concentrations (i.e., the UL), as determined by current essential nutrient information published by the IOM for all but one well.

- The estimated total intake based on data from MW-46-175 is only 10% above the nutritionally safe UL, and is based on a single data point from the only sample analyzed for molybdenum from this well.

- Accordingly, as levels of molybdenum in only one well (1% of wells) only slightly exceed the nutritionally safe UL, even when considering the contribution of molybdenum from the diet, it may be concluded that molybdenum is unlikely to pose adverse health effects to future hypothetical receptors including the most sensitive members of the general population that hypothetically could use site groundwater as a potable source of water.

5.2 Selenium

- Consistent with USEPA guidance for metals risk assessment, DRI UL values should be considered in evaluating the potential health impacts associated with future hypothetical exposures to selenium in site groundwater.

- The estimated intake of groundwater from all wells is below the safe concentrations (i.e., the UL) as determined by current essential nutrient information published by the IOM.

- When estimated dietary intake for selenium is added to potential groundwater intake for the future hypothetical groundwater user, total estimated intakes of selenium are comparable to or below safe concentrations (i.e., the UL) for all but three wells (MW-21, MW-24A, and TW-1) as determined by current essential nutrient information published by the IOM.

- Levels of selenium in MW-21 and MW-24A exceed the UL (when considering intake from both groundwater and diet) only for the child 1 to 3 years by 20% and 30 % respectively.

- The selenium UL for the child receptors is based on a different study than the adult. The UL for the child (both age groups) is based on the highest NOAEL noted. A LOAEL was not determined. Consequently, the safe intake for a child could be higher than noted for the UL.

- Levels of selenium in only one well (TW-1 – 1% of wells) exceed the nutritionally safe UL, for all three age groups. The highest exceedance is only by a factor of approximately 2, when considering the contribution of selenium from both groundwater and the diet.

- None of the three wells noting estimated exceedances of the UL (when considering intake from both groundwater and diet) are located on the portion of the site identified by USDOI as having potential future residential use.

- Therefore, selenium is unlikely to pose adverse health effects to future hypothetical groundwater users including the most sensitive members of the general population.

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Tables

Table M-1. Comparison of Molybdenum Site Intake from Groundwater and Diet to the Tolerable Upper Intake Level

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	EPC (mg/L)	Site Groundwater Intake (mg/day)[1]		Dietary Intake[2] (mg/day)			Estimated Total Intake Site Groundwater + Diet (mg/day)			Total Intake (Site Groundwater + Diet) Exceed UL?		
						Adult	Child	Adult	Child 1 to 3	Child 4 to 8	Adult	Child 1 to 3	Child 4 to 8	Adult	Child 1 to 3	Child 4 to 8
CW-1D	8	8	0.012	0.0518	0.04	0.0800	0.0400	0.250	0.130	0.150	0.330	0.170	0.190	No	No	No
CW-2D	8	8	0.0339	0.0732	0.061	0.1220	0.0610	0.250	0.130	0.150	0.372	0.191	0.211	No	No	No
CW-3D	8	8	0.0292	0.0882	0.065	0.1300	0.0650	0.250	0.130	0.150	0.380	0.195	0.215	No	No	No
CW-3M	8	8	0.0154	0.0378	0.03	0.0600	0.0300	0.250	0.130	0.150	0.310	0.160	0.180	No	No	No
CW-4D	8	8	0.0218	0.0442	0.042	0.0840	0.0420	0.250	0.130	0.150	0.334	0.172	0.192	No	No	No
MW-1	12	3	0.0057	0.078	0.078	0.1560	0.0780	0.250	0.130	0.150	0.406	0.208	0.228	No	No	No
MW-10	17	17	0.0683	0.301	0.17	0.3400	0.1700	0.250	0.130	0.150	0.590	0.300	0.320	No	No	No
MW-12	20	20	0.019	0.087	0.054	0.1080	0.0540	0.250	0.130	0.150	0.358	0.184	0.204	No	No	No
MW-20-130	15	15	0.018	0.0576	0.048	0.0960	0.0480	0.250	0.130	0.150	0.346	0.178	0.198	No	No	No
MW-21	6	5	0.0239	0.052	0.052	0.1040	0.0520	0.250	0.130	0.150	0.354	0.182	0.202	No	No	No
MW-22	6	5	0.031	0.0562	0.056	0.1120	0.0560	0.250	0.130	0.150	0.362	0.186	0.206	No	No	No
MW-24A	5	5	0.011	0.0397	0.04	0.0800	0.0400	0.250	0.130	0.150	0.330	0.170	0.190	No	No	No
MW-24B	3	3	0.053	0.0649	0.065	0.1300	0.0650	0.250	0.130	0.150	0.380	0.195	0.215	No	No	No
MW-24BR	2	2	0.036	0.058	0.058	0.1160	0.0580	0.250	0.130	0.150	0.366	0.188	0.208	No	No	No
MW-26	6	6	0.0288	0.043	0.043	0.0860	0.0430	0.250	0.130	0.150	0.336	0.173	0.193	No	No	No
MW-3	12	11	0.025	0.041	0.034	0.0680	0.0340	0.250	0.130	0.150	0.318	0.164	0.184	No	No	No
MW-30-30	4	2	0.011	0.1	0.1	0.2000	0.1000	0.250	0.130	0.150	0.450	0.230	0.250	No	No	No
MW-33-90	1	1	0.0369	0.0369	0.037	0.0740	0.0370	0.250	0.130	0.150	0.324	0.167	0.187	No	No	No
MW-34-100	2	2	0.0362	0.0367	0.037	0.0740	0.0370	0.250	0.130	0.150	0.324	0.167	0.187	No	No	No
MW-37D	13	13	0.034	0.0518	0.047	0.0940	0.0470	0.250	0.130	0.150	0.344	0.177	0.197	No	No	No
MW-38D	1	1	0.0797	0.0797	0.08	0.1600	0.0800	0.250	0.130	0.150	0.410	0.210	0.230	No	No	No
MW-38S	1	1	0.0637	0.0637	0.064	0.1280	0.0640	0.250	0.130	0.150	0.378	0.194	0.214	No	No	No
MW-40D	1	1	0.0458	0.0458	0.046	0.0920	0.0460	0.250	0.130	0.150	0.342	0.176	0.196	No	No	No
MW-44-115	3	3	0.0729	0.0856	0.086	0.1720	0.0860	0.250	0.130	0.150	0.422	0.216	0.236	No	No	No

Table M-1. Comparison of Molybdenum Site Intake from Groundwater and Diet to the Tolerable Upper Intake Level

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	EPC (mg/L)	Site Groundwater Intake (mg/day)[1]		Dietary Intake[2] (mg/day)			Estimated Total Intake Site Groundwater + Diet (mg/day)			Total Intake (Site Groundwater + Diet) Exceed UL?		
						Adult	Child	Adult	Child 1 to 3	Child 4 to 8	Adult	Child 1 to 3	Child 4 to 8	Adult	Child 1 to 3	Child 4 to 8
MW-44-125	1	1	0.125	0.125	0.13	0.2600	0.1300	0.250	0.130	0.150	0.510	0.260	0.280	No	No	No
MW-46-175	1	1	0.196	0.196	0.2	0.4000	0.2000	0.250	0.130	0.150	0.650	**0.330**	0.350	No	**Yes**	No
MW-5	12	11	0.039	0.15	0.091	0.1820	0.0910	0.250	0.130	0.150	0.432	0.221	0.241	No	No	No
MW-50-200	3	3	0.0404	0.054	0.054	0.1080	0.0540	0.250	0.130	0.150	0.358	0.184	0.204	No	No	No
MW-51	3	3	0.0336	0.04	0.04	0.0800	0.0400	0.250	0.130	0.150	0.330	0.170	0.190	No	No	No
OW-1D	17	17	0.0088	0.0518	0.032	0.0640	0.0320	0.250	0.130	0.150	0.314	0.162	0.182	No	No	No
OW-2D	16	16	0.0082	0.0665	0.041	0.0820	0.0410	0.250	0.130	0.150	0.332	0.171	0.191	No	No	No
OW-2S	15	15	0.029	0.0893	0.048	0.0960	0.0480	0.250	0.130	0.150	0.346	0.178	0.198	No	No	No
OW-3D	2	2	0.031	0.0437	0.044	0.0880	0.0440	0.250	0.130	0.150	0.338	0.174	0.194	No	No	No
OW-5D	16	16	0.0118	0.0838	0.048	0.0960	0.0480	0.250	0.130	0.150	0.346	0.178	0.198	No	No	No
OW-5M	16	16	0.0098	0.0501	0.032	0.0640	0.0320	0.250	0.130	0.150	0.314	0.162	0.182	No	No	No
PGE-7	2	2	0.054	0.056	0.056	0.1120	0.0560	0.250	0.130	0.150	0.362	0.186	0.206	No	No	No
PGE-8	3	3	0.056	0.078	0.078	0.1560	0.0780	0.250	0.130	0.150	0.406	0.208	0.228	No	No	No
TW-2D	3	3	0.0332	0.05	0.05	0.1000	0.0500	0.250	0.130	0.150	0.350	0.180	0.200	No	No	No

Notes:

Bold indicates total estimated intake value exceeding the corresponding UL.

(1) Note that ingestion intake from molybdenum is two orders of magnitude higher than dermal exposure; thus, only ingestion is evaluated since dermal exposure does not significantly impact overall intake of molybdenum. Daily intake was calculated by multiplying the EPC times the ingestion rate (Adult = 2L/day; Child = 1L/day).

(2) Based on calculated daily intake of molybdenum from diet based on study evaluating dietary intake of molybdenum in the United States (USEPA, 2009; Tsongas et al., 1980). Child (1 to 3 yrs) = 0.130; Child (4 to 8 yrs) = 0.150 mg/day; Adult (>16 years) = 0.250 mg/day.

EPC = exposure point concentration
L = liter
mg = milligram(s)
UL = tolerable upper intake level

Table M-2. Comparison of Selenium Site Intake from Groundwater and Diet to the Tolerable Upper Intake Level

Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	EPC (mg/L)	Site Groundwater Intake (mg/day)[1]		Dietary Intake[2] (mg/day)			Estimated Total Intake Site Groundwater + Diet (mg/day)			Total Intake (Site Groundwater + Diet) Exceed UL? (mg/kg/day)		
						Adult	Child	Adult	Child 1 to 3	Child 4 to 8	Adult UL=0.400	Child 1 to 3 UL=0.09	Child 4 to 8 UL=0.15	Adult	Child 1 to 3	Child 4 to 8
MW-10	14	10	0.00193	0.02	0.0075	0.0150	0.0075	0.1590	0.0655	0.0868	0.174	0.073	0.094	No	No	No
MW-11	10	7	0.0045	0.0136	0.0081	0.0162	0.0081	0.1590	0.0655	0.0868	0.175	0.074	0.095	No	No	No
MW-20-130	12	11	0.0107	0.023	0.016	0.0320	0.0160	0.1590	0.0655	0.0868	0.191	0.082	0.103	No	No	No
MW-20-70	13	9	0.00783	0.0181	0.012	0.0240	0.0120	0.1590	0.0655	0.0868	0.183	0.078	0.099	No	No	No
MW-21	4	4	0.012	0.038	0.038	0.0760	0.0380	0.1590	0.0655	0.0868	0.235	**0.104**	0.125	No	**Yes***	No
MW-23	4	4	0.00544	0.0109	0.011	0.0220	0.0110	0.1590	0.0655	0.0868	0.181	0.077	0.098	No	No	No
MW-24A	3	2	0.00529	0.0507	0.051	0.1020	0.0510	0.1590	0.0655	0.0868	0.261	**0.117**	0.138	No	**Yes***	No
MW-24B	1	1	0.0143	0.0143	0.014	0.0280	0.0140	0.1590	0.0655	0.0868	0.187	0.080	0.101	No	No	No
MW-25	10	7	0.00204	0.0131	0.0057	0.0114	0.0057	0.1590	0.0655	0.0868	0.170	0.071	0.093	No	No	No
MW-26	3	3	0.0144	0.0168	0.017	0.0340	0.0170	0.1590	0.0655	0.0868	0.193	0.083	0.104	No	No	No
MW-34-55	9	1	0.0125	0.0125	0.013	0.0260	0.0130	0.1590	0.0655	0.0868	0.185	0.079	0.100	No	No	No
MW-5	2	2	0.0173	0.0203	0.02	0.0400	0.0200	0.1590	0.0655	0.0868	0.199	0.086	0.107	No	No	No
MW-51	3	3	0.0115	0.0182	0.018	0.0360	0.0180	0.1590	0.0655	0.0868	0.195	0.084	0.105	No	No	No
MW-9	2	2	0.00622	0.0132	0.013	0.0260	0.0130	0.1590	0.0655	0.0868	0.185	0.079	0.100	No	No	No
OW-5M	14	3	0.00236	0.0186	0.019	0.0380	0.0190	0.1590	0.0655	0.0868	0.197	0.085	0.106	No	No	No
TW-1	4	4	0.0553	0.155	0.16	0.3200	0.1600	0.1590	0.0655	0.0868	**0.479**	**0.226**	**0.247**	**Yes**	**Yes**	**Yes**
TW-2S	3	1	0.02	0.02	0.02	0.0400	0.0200	0.1590	0.0655	0.0868	0.199	0.086	0.107	No	No	No

Notes:

Bold indicates total estimated intake value exceeding the corresponding UL.

(1) Note that ingestion intake from selenium is two orders of magnitude higher than dermal exposure; thus, only ingestion is evaluated since dermal exposure does not significantly impact overall intake of selenium. Daily intake was calculated by multiplying the EPC times the ingestion rate (Adult = 2L/day; Child = 1L/day).

(2) Based on calculated daily intake of selenium from diet based on study evaluating dietary intake of selenium in the United States (USEPA, 2009; Tsongas et al., 1980). Child (1 to 3 yrs) = 0.130; Child (4 to 8 yrs) = 0.150 mg/day; Adult (>16 years) = 0.250 mg/day.

(3) UL = Tolerable Upper Intake Level is the highest level of daily nutrient intake that is likely to pose no risk of adverse health effects for almost all individuals in the specified life stage group; ULs are based on total intake of a nutrient from food, water, and supplements. UL for adult = 0.4 mg/day; child (1 to 3) =0.090 mg/day; and child (4 to 8) = 0.150 mg/day.

* Note that the UL for infants and children were based on the highest tested dose which resulted in no observable adverse effect level (NOAEL); thus, the safe amount is likely higher than that tested.

EPC = exposure point concentration
L = liter
mg = milligram(s)
UL = tolerable upper intake level

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Appendix N

Target Organs Impacted by Selenium, Nitrate, Molybdenum, and Hexavalent Chromium

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Appendix N: Target Organs Impacted by Selenium, Nitrate, Molybdenum, and Hexavalent Chromium

HERA of Groundwater Impacted by Activities at
SWMU 1/AOC 1 and SWMU 2
Topock Compressor Station, Needles, California

November 2009

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Appendix N

Target Organs Impacted by Selenium, Nitrate, Molybdenum, and Hexavalent Chromium

1. Target Organs Impacted by Selected Chemicals **1**

2. References **4**

Table

N-1 Target Organs Imapcted by Selenium, Nitrate, Molybdenum, and Hexavalent Chromium

Acronyms and Abbreviations

AOC	Area of Concern
CalEPA	California Environmental Protection Agency
CNS	central nervous system
COPC	constituent of potential concern
GWRA	groundwater risk assessment
HI	hazard index
HQ	hazard quotient
NOAEL	No Observable Adverse Effect Level
RAGS	Risk Assessment Guidance for Superfund
RfD	reference dose
SWMU	Solid Waste Management Unit
USEPA	U.S. Environmental Protection Agency

Appendix N

Target Organs Impacted by Selenium, Nitrate, Molybdenum, and Hexavalent Chromium

1. Target Organs Impacted by Selected Chemicals

The purpose of this appendix is to present Table N-1, which summarizes the critical target organs that are impacted by exposure to selenium, nitrate, molybdenum, and hexavalent chromium. As stated in the main text of the groundwater risk assessment (GWRA), the approach for evaluating noncarcinogenic effects from exposure to constituents of potential concern (COPCs) assumes that simultaneous subthreshold exposures to several chemicals could result in an adverse health effect. This approach also assumes that the magnitude of the adverse effect will be proportional to the sum of the ratios of the subthreshold exposures to acceptable exposures (i.e., the sum of the hazard quotients [HQs]; referred to as the hazard index [HI]). As noted in the GWRA, when the noncancer HI exceeds unity, there may be a concern for potential noncancer health effects. The assumption of dose additivity is most properly applied to compounds that induce the same effect by the same mechanism of action (U.S. Environmental Protection Agency [USEPA], 1989). Consequently, the summing of HQs for all chemicals that are not expected to induce the same type of effects or that do not act by the same mechanism, as done in the risk assessment, could overestimate the potential for noncancer health effects. Accordingly, and consistent with USEPA risk assessment guidance (USEPA, 1989), the target organs/critical effects posed by each of the four subject compounds were identified in order to assess whether the summing of HQs for each of these four compounds may result in overly conservative estimates of the potential for noncancer health effects[1]. Typically, although a compound may impact multiple target organs at different doses, the target organ that is identified as the 'critical target organ' is the target organ that was used in the development of the noncancer reference dose (RfD) (and is typically the most sensitive target organ); the critical target organ is used in assessing whether it may be overly conservative to sum the HQs calculated from selenium, nitrate, molybdenum, and hexavalent chromium.[2]

Table N-1 summarizes the critical target organs for selenium, nitrate, molybdenum, and hexavalent chromium. The target organs identified in this table were obtained from USEPA's Integrated Risk Information System (USEPA, 2008), which summarizes the

[1] We note that California Environmental Protection Agency (CalEPA), Department of Toxic Substances Control risk assessment guidance also supports the segregation of noncancer impacts by critical effect/target organ. See page 10 of CalEPA (2009).

[2] According to *Risk Assessment Guidance for Superfund* (RAGS) Part A (USEPA, 1989), Exhibit on page 8-15, "Segregation of hazard indices requires identification of the major effects of each chemical, including those seen at higher doses than the critical effect. Although higher exposure levels may be required to produce adverse health effects other than the critical effect, the RfD can be used as the toxicity value for each effect category as a conservative and simplifying step."

noncancer RfDs and the target organ that elicited the critical effect. As indicated in the table, the key target organs impacted by selenium, molybdenum, and hexavalent chromium and those upon which these reference doses have been based, are different from each other. In contrast, as indicated in Table N-1, both hexavalent chromium and nitrate, at specified doses, affect the blood. Accordingly, per USEPA risk assessment guidance (1989), to sum the individual HQs for selenium, molybdenum, and hexavalent chromium (i.e., three compounds that are not expected to induce the same type of effects or that do not act by the same mechanism), can result in overestimating the potential for noncancer effects. Rather, a more reasonable estimate of the potential for noncancer hazards for these three compounds can be obtained by examining the chemical-specific HIs for each of these three compounds. At those locations where both nitrate and hexavalent chromium are present, it is reasonable to evaluate the potential for adverse noncancer health effects on the blood system by examining the sum of the HQs for these two compounds.[3]

The information presented in this appendix provides additional perspective on the significance of the cumulative risk estimates for the four facility-related COPCs (selenium, nitrate, molybdenum, and hexavalent chromium), presented in the main text of the GWRA.

[3] As indicated in Appendix R, there are only five out of 165 groundwater wells where nitrate contributes materially to an elevated HI: MW-9 (with a nitrate HI of 0.9 and a hexavalent chromium HI of 7.5), MW-24A (with a nitrate HI of 0.74 and a hexavalent chromium HI of 73); MW-40D (with a nitrate HI of 0.79 and a hexavalent chromium HI of 1.8); MW-51 (with a nitrate HI of 0.57 and a hexavalent chromium HI of 100), and PT-8M (with a nitrate HI of 1.3 and a hexavalent chromium HI of 85). Each of these five wells is located south of I-40, on land where residential use is not considered a reasonable future land use. The total noncancer HI at each of these five wells is dominated by hexavalent chromium.

Table N-1. Target Organs Impacted by Selenium, Nitrate, Molybdenum, and Hexavalent Chromium

Chemical	Critical Effect/Target Organ (1)
Hexavalent Chromium	No Observable Adverse Effect Level (NOAEL) (2)
Molybdenum	Kidney: Increase in uric acid levels
Nitrate as Nitrogen	Blood: Methemoglobinemia
Selenium	Skin and hair - Dermatitis, brittle nails, loss of hair and nails, mottled and eroded teeth, and skin lesions Central nervous system (CNS) abnormalities - peripheral anesthesia, acroparesthesia, and pain in the extremities

Notes:

(1) Critical Effect/Target Organ on which oral RfD is based.

(2) Although the RfD for hexavalent chromium was based on a study in which no adverse effects were observed (the RfD was derived from a NOAEL, California's Office of Environmental Health Hazard Assessment identifies effects on red blood cells as the critical effect for oral exposure to hexavalent chromium (specifically, decreased mean corpuscular volume and mean corpuscular hemoglobin in mice). http://www.oehha.ca.gov/air/hot_spots/2008/AppendixD3_final.pdf#page=138.

2. References

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Appendix O

Estimated Potential Cancer Risks and Noncancer Hazard Indices – Hypothetical Future Groundwater User

Table O-1. Estimated Potential Cancer Risks – Hypothetical Future Groundwater User – Well-Specific

	Groundwater Cancer Risk								
	On-Site Resident Child			On-Site Resident Adult			On-Site Resident Age-Adjusted		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk
MW-12									
Aluminum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	3.6E-05	5.5E-03	5.5E-03	6.1E-05	1.2E-02	1.2E-02	8.5E-05	1.5E-02	1.5E-02
Barium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cumulative risk	3.6E-05	5.5E-03	5.5E-03	6.1E-05	1.2E-02	1.2E-02	8.5E-05	1.5E-02	1.5E-02

Table O-1. Estimated Potential Cancer Risks – Hypothetical Future Groundwater User – Well-Specific

	Groundwater Cancer Risk								
	On-Site Resident Child			On-Site Resident Adult			On-Site Resident Age-Adjusted		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk
MW-24A									
Aluminum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	1.1E-05	1.7E-03	1.8E-03	1.9E-05	3.7E-03	3.7E-03	2.7E-05	4.7E-03	4.7E-03
Barium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cumulative risk	1.1E-05	1.7E-03	1.8E-03	1.9E-05	3.7E-03	3.7E-03	2.7E-05	4.7E-03	4.7E-03

Table O-1. Estimated Potential Cancer Risks – Hypothetical Future Groundwater User – Well-Specific

	Groundwater Cancer Risk								
	On-Site Resident Child			On-Site Resident Adult			On-Site Resident Age-Adjusted		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk	Dermal Contact	Ingestion	Total Risk
MW-43-25									
Aluminum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Antimony	NC	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	8.3E-06	1.3E-03	1.3E-03	1.4E-05	2.7E-03	2.7E-03	2.0E-05	3.4E-03	3.4E-03
Barium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Beryllium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cadmium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chromium, hexavalent	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cobalt	NC	NC	NC	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluoride	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nitrate as nitrogen	NC	NC	NC	NC	NC	NC	NC	NC	NC
Selenium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cumulative risk	8.3E-06	1.3E-03	1.3E-03	1.4E-05	2.7E-03	2.7E-03	2.0E-05	3.4E-03	3.4E-03

Notes:
NC = noncarcinogenic compound, therefore no cancer risk calculated

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-1						
Aluminum	2.9E-05	4.4E-03	4.4E-03	9.8E-06	1.9E-03	1.9E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	5.6E-02	8.5E+00	8.5E+00	1.9E-02	3.6E+00	3.6E+00
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	6.6E-03	1.0E+00	1.0E+00	2.2E-03	4.3E-01	4.3E-01
Nickel	9.7E-05	7.4E-02	7.4E-02	3.3E-05	3.2E-02	3.2E-02
Nitrate as nitrogen	1.7E-03	2.5E-01	2.5E-01	5.6E-04	1.1E-01	1.1E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	6.4E-02	9.8E+00	9.9E+00	2.2E-02	4.2E+00	4.2E+00
MW-3						
Aluminum	2.7E-05	4.1E-03	4.1E-03	9.1E-06	1.7E-03	1.8E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.9E-03	4.4E-01	4.4E-01	9.8E-04	1.9E-01	1.9E-01
Nickel	1.8E-04	1.3E-01	1.3E-01	6.0E-05	5.8E-02	5.8E-02
Nitrate as nitrogen	2.9E-03	4.4E-01	4.4E-01	9.8E-04	1.9E-01	1.9E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	6.0E-03	1.0E+00	1.0E+00	2.0E-03	4.4E-01	4.4E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-4						
Aluminum	2.6E-05	4.0E-03	4.0E-03	8.8E-06	1.7E-03	1.7E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	9.3E-05	7.0E-02	7.0E-02	3.1E-05	3.0E-02	3.0E-02
Nitrate as nitrogen	1.7E-03	2.5E-01	2.5E-01	5.6E-04	1.1E-01	1.1E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.8E-03	3.3E-01	3.3E-01	6.0E-04	1.4E-01	1.4E-01
MW-5						
Aluminum	2.5E-05	3.7E-03	3.8E-03	8.4E-06	1.6E-03	1.6E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	7.7E-03	1.2E+00	1.2E+00	2.6E-03	5.0E-01	5.0E-01
Nickel	8.4E-05	6.4E-02	6.4E-02	2.9E-05	2.7E-02	2.7E-02
Nitrate as nitrogen	5.0E-03	7.6E-01	7.6E-01	1.7E-03	3.2E-01	3.3E-01
Selenium	1.7E-03	2.6E-01	2.6E-01	5.8E-04	1.1E-01	1.1E-01
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.5E-02	2.2E+00	2.3E+00	4.9E-03	9.6E-01	9.7E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-6						
Aluminum	2.6E-05	4.0E-03	4.0E-03	8.8E-06	1.7E-03	1.7E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	6.0E-02	9.2E+00	9.2E+00	2.0E-02	3.9E+00	3.9E+00
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	6.1E-02	9.2E+00	9.2E+00	2.1E-02	3.9E+00	3.9E+00
MW-7						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	8.4E-05	6.4E-02	6.4E-02	2.9E-05	2.7E-02	2.7E-02
Nitrate as nitrogen	2.1E-03	3.1E-01	3.1E-01	7.0E-04	1.3E-01	1.3E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.1E-03	3.8E-01	3.8E-01	7.3E-04	1.6E-01	1.6E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-8						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.4E-02	1.1E+00	1.1E+00	4.9E-03	4.6E-01	4.7E-01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.2E-04	1.8E-02	1.8E-02	4.1E-05	7.8E-03	7.8E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	6.8E-05	5.1E-02	5.1E-02	2.3E-05	2.2E-02	2.2E-02
Nitrate as nitrogen	5.4E-03	8.2E-01	8.2E-01	1.8E-03	3.5E-01	3.5E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.0E-02	2.0E+00	2.0E+00	6.7E-03	8.5E-01	8.5E-01
MW-9						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	9.8E-02	7.4E+00	7.5E+00	3.3E-02	3.2E+00	3.2E+00
Cobalt	ND	ND	ND	ND	ND	ND
Copper	7.7E-05	1.2E-02	1.2E-02	2.6E-05	5.0E-03	5.1E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.4E-05	2.6E-02	2.6E-02	1.1E-05	1.1E-02	1.1E-02
Nitrate as nitrogen	6.0E-03	9.0E-01	9.1E-01	2.0E-03	3.9E-01	3.9E-01
Selenium	1.1E-03	1.7E-01	1.7E-01	3.8E-04	7.2E-02	7.3E-02
Silver	3.0E-04	7.5E-02	7.6E-02	1.0E-04	3.2E-02	3.2E-02
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.7E-04	4.4E-02	4.4E-02	5.9E-05	1.9E-02	1.9E-02
Cumulative noncancer hazard index	1.1E-01	8.6E+00	8.7E+00	3.6E-02	3.7E+00	3.7E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-10						
Aluminum	2.7E-05	4.1E-03	4.2E-03	9.2E-06	1.8E-03	1.8E-03
Antimony	3.5E-03	5.3E-01	5.3E-01	1.2E-03	2.3E-01	2.3E-01
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	5.7E-01	4.3E+01	4.4E+01	1.9E-01	1.9E+01	1.9E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	5.2E-05	7.8E-03	7.9E-03	1.8E-05	3.4E-03	3.4E-03
Fluoride	1.7E-01	2.6E+01	2.6E+01	5.9E-02	1.1E+01	1.1E+01
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	1.4E-02	2.1E+00	2.1E+00	4.8E-03	9.2E-01	9.2E-01
Nickel	2.8E-05	2.1E-02	2.1E-02	9.5E-06	9.1E-03	9.1E-03
Nitrate as nitrogen	4.2E-03	6.4E-01	6.5E-01	1.4E-03	2.8E-01	2.8E-01
Selenium	6.3E-04	9.6E-02	9.7E-02	2.2E-04	4.1E-02	4.1E-02
Silver	3.1E-03	7.9E-01	7.9E-01	1.1E-03	3.4E-01	3.4E-01
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	3.6E-03	5.4E-01	5.4E-01	1.2E-03	2.3E-01	2.3E-01
Zinc	1.5E-04	3.9E-02	3.9E-02	5.2E-05	1.7E-02	1.7E-02
Cumulative noncancer hazard index	7.7E-01	7.4E+01	7.5E+01	2.6E-01	3.2E+01	3.2E+01
MW-11						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	1.9E-04	2.9E-02	3.0E-02	6.6E-05	1.3E-02	1.3E-02
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.4E-01	1.8E+01	1.9E+01	8.2E-02	7.9E+00	7.9E+00
Cobalt	ND	ND	ND	ND	ND	ND
Copper	5.1E-05	7.7E-03	7.8E-03	1.7E-05	3.3E-03	3.3E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	2.9E-05	2.2E-02	2.2E-02	9.9E-06	9.5E-03	9.5E-03
Nitrate as nitrogen	2.8E-03	4.2E-01	4.2E-01	9.3E-04	1.8E-01	1.8E-01
Selenium	6.9E-04	1.0E-01	1.0E-01	2.3E-04	4.5E-02	4.5E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.5E-04	3.8E-02	3.8E-02	5.1E-05	1.6E-02	1.6E-02
Cumulative noncancer hazard index	2.5E-01	1.9E+01	1.9E+01	8.3E-02	8.1E+00	8.2E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-12						
Aluminum	2.9E-05	4.3E-03	4.4E-03	9.7E-06	1.9E-03	1.9E-03
Antimony	2.2E-02	3.3E+00	3.4E+00	7.5E-03	1.4E+00	1.4E+00
Arsenic	1.5E-01	2.3E+01	2.3E+01	5.1E-02	9.7E+00	9.7E+00
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	3.8E-01	2.9E+01	2.9E+01	1.3E-01	1.2E+01	1.2E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	5.2E-05	7.9E-03	7.9E-03	1.8E-05	3.4E-03	3.4E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.6E-03	6.9E-01	7.0E-01	1.6E-03	3.0E-01	3.0E-01
Nickel	2.7E-05	2.0E-02	2.0E-02	9.0E-06	8.7E-03	8.7E-03
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	7.2E-03	1.1E+00	1.1E+00	2.4E-03	4.7E-01	4.7E-01
Vanadium	4.9E-03	7.5E-01	7.5E-01	1.7E-03	3.2E-01	3.2E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	5.6E-01	5.7E+01	5.8E+01	1.9E-01	2.4E+01	2.5E+01
MW-13						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	6.8E-05	1.0E-02	1.0E-02	2.3E-05	4.4E-03	4.5E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	1.1E-04	8.6E-02	8.6E-02	3.9E-05	3.7E-02	3.7E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.8E-04	4.6E-02	4.6E-02	6.2E-05	2.0E-02	2.0E-02
Cumulative noncancer hazard index	3.6E-04	1.4E-01	1.4E-01	1.2E-04	6.1E-02	6.1E-02

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-14						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.2E-02	9.3E-01	9.4E-01	4.2E-03	4.0E-01	4.0E-01
Cobalt	1.4E-03	2.2E-01	2.2E-01	4.8E-04	9.2E-02	9.3E-02
Copper	8.4E-05	1.3E-02	1.3E-02	2.9E-05	5.5E-03	5.5E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	5.7E-05	4.3E-02	4.3E-02	1.9E-05	1.8E-02	1.8E-02
Nitrate as nitrogen	1.9E-03	2.9E-01	2.9E-01	6.5E-04	1.2E-01	1.3E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.5E-04	3.8E-02	3.8E-02	5.1E-05	1.6E-02	1.6E-02
Cumulative noncancer hazard index	1.6E-02	1.5E+00	1.5E+00	5.4E-03	6.6E-01	6.6E-01
MW-15						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	4.6E-03	3.5E-01	3.5E-01	1.6E-03	1.5E-01	1.5E-01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	9.8E-05	1.5E-02	1.5E-02	3.3E-05	6.4E-03	6.4E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.3E-05	2.5E-02	2.5E-02	1.1E-05	1.1E-02	1.1E-02
Nitrate as nitrogen	2.6E-03	3.9E-01	3.9E-01	8.7E-04	1.7E-01	1.7E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.6E-04	4.0E-02	4.1E-02	5.4E-05	1.7E-02	1.7E-02
Cumulative noncancer hazard index	7.4E-03	8.2E-01	8.2E-01	2.5E-03	3.5E-01	3.5E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-19						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.5E-01	1.9E+01	1.9E+01	8.6E-02	8.2E+00	8.3E+00
Cobalt	ND	ND	ND	ND	ND	ND
Copper	6.9E-05	1.0E-02	1.1E-02	2.3E-05	4.5E-03	4.5E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.2E-05	2.4E-02	2.4E-02	1.1E-05	1.0E-02	1.0E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.8E-04	4.7E-02	4.7E-02	6.3E-05	2.0E-02	2.0E-02
Cumulative noncancer hazard index	2.5E-01	1.9E+01	2.0E+01	8.6E-02	8.3E+00	8.3E+00
MW-20-70						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	9.3E-03	1.4E+00	1.4E+00	3.1E-03	6.0E-01	6.1E-01
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.7E+00	2.1E+02	2.1E+02	9.2E-01	8.8E+01	8.9E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.1E-04	1.7E-02	1.7E-02	3.9E-05	7.4E-03	7.4E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	2.9E-05	2.2E-02	2.2E-02	1.0E-05	9.5E-03	9.6E-03
Nitrate as nitrogen	3.3E-03	4.9E-01	5.0E-01	1.1E-03	2.1E-01	2.1E-01
Selenium	1.0E-03	1.5E-01	1.5E-01	3.4E-04	6.5E-02	6.5E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	3.5E-03	5.3E-01	5.3E-01	1.2E-03	2.3E-01	2.3E-01
Zinc	1.7E-04	4.2E-02	4.2E-02	5.6E-05	1.8E-02	1.8E-02
Cumulative noncancer hazard index	2.7E+00	2.1E+02	2.1E+02	9.3E-01	8.9E+01	9.0E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-20-100						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	4.5E-02	6.9E+00	6.9E+00	1.5E-02	2.9E+00	3.0E+00
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.1E+00	1.6E+02	1.6E+02	7.1E-01	6.8E+01	6.8E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.2E-04	1.8E-02	1.9E-02	4.1E-05	7.9E-03	7.9E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	9.6E-05	7.3E-02	7.3E-02	3.3E-05	3.1E-02	3.1E-02
Nitrate as nitrogen	3.7E-03	5.6E-01	5.7E-01	1.3E-03	2.4E-01	2.4E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.6E-04	4.1E-02	4.1E-02	5.5E-05	1.8E-02	1.8E-02
Cumulative noncancer hazard index	2.1E+00	1.7E+02	1.7E+02	7.2E-01	7.1E+01	7.2E+01
MW-20-130						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.4E+00	1.8E+02	1.8E+02	8.1E-01	7.8E+01	7.9E+01
Cobalt	1.5E-03	2.3E-01	2.3E-01	5.2E-04	1.0E-01	1.0E-01
Copper	1.2E-04	1.9E-02	1.9E-02	4.2E-05	8.1E-03	8.1E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.0E-03	6.1E-01	6.2E-01	1.4E-03	2.6E-01	2.6E-01
Nickel	1.4E-04	1.0E-01	1.0E-01	4.7E-05	4.5E-02	4.5E-02
Nitrate as nitrogen	3.0E-03	4.5E-01	4.6E-01	1.0E-03	1.9E-01	2.0E-01
Selenium	1.3E-03	2.0E-01	2.0E-01	4.5E-04	8.7E-02	8.7E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	6.1E-03	9.2E-01	9.3E-01	2.1E-03	4.0E-01	4.0E-01
Zinc	9.1E-05	2.3E-02	2.3E-02	3.1E-05	9.9E-03	9.9E-03
Cumulative noncancer hazard index	2.4E+00	1.8E+02	1.9E+02	8.2E-01	7.9E+01	8.0E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-21						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	2.8E-04	4.3E-02	4.3E-02	9.6E-05	1.8E-02	1.9E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.4E-03	6.6E-01	6.7E-01	1.5E-03	2.8E-01	2.9E-01
Nickel	2.1E-04	1.6E-01	1.6E-01	7.0E-05	6.7E-02	6.7E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	3.2E-03	4.9E-01	4.9E-01	1.1E-03	2.1E-01	2.1E-01
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	2.8E-04	6.9E-02	7.0E-02	9.3E-05	3.0E-02	3.0E-02
Cumulative noncancer hazard index	8.4E-03	1.4E+00	1.4E+00	2.8E-03	6.1E-01	6.1E-01
MW-22						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	1.1E-03	1.6E-01	1.6E-01	3.6E-04	6.8E-02	6.9E-02
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	7.0E-03	1.1E+00	1.1E+00	2.4E-03	4.6E-01	4.6E-01
Copper	8.2E-04	1.2E-01	1.3E-01	2.8E-04	5.3E-02	5.4E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	5.6E-04	8.5E-02	8.6E-02	1.9E-04	3.7E-02	3.7E-02
Molybdenum	4.7E-03	7.2E-01	7.2E-01	1.6E-03	3.1E-01	3.1E-01
Nickel	6.3E-04	4.8E-01	4.8E-01	2.1E-04	2.1E-01	2.1E-01
Nitrate as nitrogen	1.8E-03	2.7E-01	2.7E-01	6.0E-04	1.2E-01	1.2E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	1.1E-02	1.6E+00	1.6E+00	3.7E-03	7.0E-01	7.0E-01
Zinc	1.7E-04	4.2E-02	4.2E-02	5.6E-05	1.8E-02	1.8E-02
Cumulative noncancer hazard index	2.8E-02	4.6E+00	4.6E+00	9.3E-03	2.0E+00	2.0E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-23						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	1.1E-02	1.7E+00	1.7E+00	3.8E-03	7.3E-01	7.3E-01
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	2.0E-04	3.0E-02	3.0E-02	6.6E-05	1.3E-02	1.3E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.5E-04	2.6E-01	2.6E-01	1.2E-04	1.1E-01	1.1E-01
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	9.2E-04	1.4E-01	1.4E-01	3.1E-04	6.0E-02	6.0E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	2.2E-04	5.6E-02	5.7E-02	7.6E-05	2.4E-02	2.4E-02
Cumulative noncancer hazard index	1.3E-02	2.2E+00	2.2E+00	4.4E-03	9.4E-01	9.4E-01
MW-24A						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	4.7E-02	7.2E+00	7.2E+00	1.6E-02	3.1E+00	3.1E+00
Barium	2.0E-03	3.0E-01	3.0E-01	6.8E-04	1.3E-01	1.3E-01
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	9.5E-01	7.2E+01	7.3E+01	3.2E-01	3.1E+01	3.1E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.5E-04	2.3E-02	2.3E-02	5.0E-05	9.7E-03	9.7E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.4E-03	5.1E-01	5.1E-01	1.1E-03	2.2E-01	2.2E-01
Nickel	2.8E-05	2.1E-02	2.1E-02	9.4E-06	9.0E-03	9.0E-03
Nitrate as nitrogen	4.8E-03	7.3E-01	7.4E-01	1.6E-03	3.1E-01	3.1E-01
Selenium	4.3E-03	6.5E-01	6.5E-01	1.5E-03	2.8E-01	2.8E-01
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.8E-04	4.5E-02	4.5E-02	6.1E-05	1.9E-02	1.9E-02
Cumulative noncancer hazard index	1.0E+00	8.1E+01	8.2E+01	3.4E-01	3.5E+01	3.5E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-24B						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.4E+00	1.0E+02	1.1E+02	4.7E-01	4.5E+01	4.5E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	6.8E-05	1.0E-02	1.0E-02	2.3E-05	4.4E-03	4.5E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	5.5E-03	8.3E-01	8.4E-01	1.9E-03	3.6E-01	3.6E-01
Nickel	5.2E-05	4.0E-02	4.0E-02	1.8E-05	1.7E-02	1.7E-02
Nitrate as nitrogen	3.7E-03	5.6E-01	5.6E-01	1.3E-03	2.4E-01	2.4E-01
Selenium	1.2E-03	1.8E-01	1.8E-01	4.1E-04	7.8E-02	7.9E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	2.0E-04	4.9E-02	5.0E-02	6.6E-05	2.1E-02	2.1E-02
Cumulative noncancer hazard index	1.4E+00	1.1E+02	1.1E+02	4.7E-01	4.6E+01	4.6E+01
MW-24BR						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	6.3E-04	9.6E-02	9.7E-02	2.1E-04	4.1E-02	4.1E-02
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	9.7E-02	7.4E+00	7.5E+00	3.3E-02	3.2E+00	3.2E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	1.6E-04	2.4E-02	2.5E-02	5.5E-05	1.0E-02	1.1E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	4.9E-03	7.4E-01	7.5E-01	1.7E-03	3.2E-01	3.2E-01
Nickel	3.2E-05	2.4E-02	2.4E-02	1.1E-05	1.0E-02	1.0E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	6.6E-05	1.7E-02	1.7E-02	2.3E-05	7.2E-03	7.2E-03
Cumulative noncancer hazard index	1.0E-01	8.3E+00	8.4E+00	3.5E-02	3.5E+00	3.6E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-25						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	6.6E-01	5.0E+01	5.1E+01	2.3E-01	2.2E+01	2.2E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	8.0E-05	1.2E-02	1.2E-02	2.7E-05	5.2E-03	5.2E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	2.4E-05	1.8E-02	1.8E-02	8.3E-06	7.9E-03	7.9E-03
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	4.8E-04	7.3E-02	7.3E-02	1.6E-04	3.1E-02	3.1E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.4E-04	3.5E-02	3.6E-02	4.7E-05	1.5E-02	1.5E-02
Cumulative noncancer hazard index	6.7E-01	5.0E+01	5.1E+01	2.3E-01	2.2E+01	2.2E+01
MW-26						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.0E+00	7.9E+01	8.1E+01	3.6E-01	3.4E+01	3.4E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	9.9E-05	1.5E-02	1.5E-02	3.4E-05	6.4E-03	6.5E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.6E-03	5.5E-01	5.5E-01	1.2E-03	2.4E-01	2.4E-01
Nickel	4.2E-05	3.2E-02	3.2E-02	1.4E-05	1.4E-02	1.4E-02
Nitrate as nitrogen	1.4E-03	2.1E-01	2.2E-01	4.8E-04	9.2E-02	9.2E-02
Selenium	1.4E-03	2.1E-01	2.2E-01	4.8E-04	9.2E-02	9.3E-02
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.8E-04	4.5E-02	4.5E-02	6.0E-05	1.9E-02	1.9E-02
Cumulative noncancer hazard index	1.1E+00	8.1E+01	8.2E+01	3.6E-01	3.5E+01	3.5E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-27-20						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	5.5E-04	8.3E-02	8.4E-02	1.9E-04	3.6E-02	3.6E-02
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	2.0E-04	3.0E-02	3.0E-02	6.8E-05	1.3E-02	1.3E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	2.0E-04	1.5E-01	1.5E-01	6.7E-05	6.4E-02	6.4E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.5E-04	3.8E-02	3.8E-02	5.1E-05	1.6E-02	1.6E-02
Cumulative noncancer hazard index	1.1E-03	3.0E-01	3.0E-01	3.7E-04	1.3E-01	1.3E-01
MW-28-25						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	5.1E-04	7.7E-02	7.7E-02	1.7E-04	3.3E-02	3.3E-02
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	9.2E-05	1.4E-02	1.4E-02	3.1E-05	6.0E-03	6.0E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.8E-05	2.9E-02	2.9E-02	1.3E-05	1.2E-02	1.2E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.3E-04	3.3E-02	3.3E-02	4.4E-05	1.4E-02	1.4E-02
Cumulative noncancer hazard index	7.7E-04	1.5E-01	1.5E-01	2.6E-04	6.5E-02	6.5E-02

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-29						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	6.3E-04	9.6E-02	9.7E-02	2.1E-04	4.1E-02	4.1E-02
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	1.0E-04	1.6E-02	1.6E-02	3.5E-05	6.7E-03	6.7E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	4.3E-05	3.3E-02	3.3E-02	1.5E-05	1.4E-02	1.4E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.4E-04	3.6E-02	3.6E-02	4.8E-05	1.5E-02	1.5E-02
Cumulative noncancer hazard index	9.2E-04	1.8E-01	1.8E-01	3.1E-04	7.7E-02	7.7E-02
MW-30-30						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	2.3E-03	3.5E-01	3.5E-01	7.9E-04	1.5E-01	1.5E-01
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	3.7E-04	5.5E-02	5.6E-02	1.2E-04	2.4E-02	2.4E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	8.4E-03	1.3E+00	1.3E+00	2.9E-03	5.5E-01	5.5E-01
Nickel	1.1E-03	8.3E-01	8.4E-01	3.7E-04	3.6E-01	3.6E-01
Nitrate as nitrogen	3.8E-03	5.8E-01	5.8E-01	1.3E-03	2.5E-01	2.5E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	1.2E-02	1.8E+00	1.8E+00	4.1E-03	7.8E-01	7.9E-01
Zinc	1.5E-04	3.8E-02	3.8E-02	5.1E-05	1.6E-02	1.6E-02
Cumulative noncancer hazard index	2.8E-02	5.0E+00	5.0E+00	9.6E-03	2.1E+00	2.1E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-30-50						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	3.7E-01	2.8E+01	2.9E+01	1.3E-01	1.2E+01	1.2E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	4.1E-04	6.3E-02	6.3E-02	1.4E-04	2.7E-02	2.7E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	3.1E-04	7.8E-02	7.8E-02	1.0E-04	3.3E-02	3.3E-02
Cumulative noncancer hazard index	3.7E-01	2.8E+01	2.9E+01	1.3E-01	1.2E+01	1.2E+01
MW-31-60						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.1E+00	8.3E+01	8.4E+01	3.7E-01	3.5E+01	3.6E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.6E-04	2.4E-02	2.4E-02	5.3E-05	1.0E-02	1.0E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	1.9E-04	1.4E-01	1.4E-01	6.3E-05	6.0E-02	6.0E-02
Nitrate as nitrogen	1.3E-03	2.0E-01	2.0E-01	4.5E-04	8.6E-02	8.6E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	7.1E-03	1.1E+00	1.1E+00	2.4E-03	4.6E-01	4.6E-01
Zinc	1.3E-04	3.2E-02	3.2E-02	4.3E-05	1.4E-02	1.4E-02
Cumulative noncancer hazard index	1.1E+00	8.4E+01	8.5E+01	3.7E-01	3.6E+01	3.6E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-31-135						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	8.0E-02	6.1E+00	6.1E+00	2.7E-02	2.6E+00	2.6E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	8.0E-02	6.1E+00	6.1E+00	2.7E-02	2.6E+00	2.6E+00
MW-32-20						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	1.1E-02	1.6E+00	1.7E+00	3.7E-03	7.0E-01	7.1E-01
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	7.2E-05	1.8E-02	1.8E-02	2.5E-05	7.8E-03	7.9E-03
Cumulative noncancer hazard index	1.1E-02	1.7E+00	1.7E+00	3.7E-03	7.1E-01	7.2E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-32-35						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	NS	NS	NS	NS	NS	NS
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	2.7E-04	6.7E-02	6.8E-02	9.0E-05	2.9E-02	2.9E-02
Cumulative noncancer hazard index	2.7E-04	6.7E-02	6.8E-02	9.0E-05	2.9E-02	2.9E-02
MW-33-40						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	2.0E-04	3.0E-02	3.0E-02	6.8E-05	1.3E-02	1.3E-02
Fluoride	6.2E-02	9.4E+00	9.4E+00	2.1E-02	4.0E+00	4.0E+00
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	1.4E-04	3.6E-02	3.7E-02	4.9E-05	1.6E-02	1.6E-02
Cumulative noncancer hazard index	6.2E-02	9.4E+00	9.5E+00	2.1E-02	4.0E+00	4.1E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-33-90						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	3.2E-03	4.9E-01	4.9E-01	1.1E-03	2.1E-01	2.1E-01
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.1E-03	4.7E-01	4.7E-01	1.1E-03	2.0E-01	2.0E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	2.7E-04	6.7E-02	6.7E-02	9.0E-05	2.9E-02	2.9E-02
Cumulative noncancer hazard index	6.6E-03	1.0E+00	1.0E+00	2.2E-03	4.4E-01	4.4E-01
MW-33-210						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	1.8E-03	2.7E-01	2.7E-01	6.0E-04	1.2E-01	1.2E-01
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.8E-03	2.7E-01	2.7E-01	6.0E-04	1.2E-01	1.2E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-34-55						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	2.7E-02	4.2E+00	4.2E+00	9.3E-03	1.8E+00	1.8E+00
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.3E-04	1.9E-02	1.9E-02	4.3E-05	8.2E-03	8.3E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	4.5E-05	3.4E-02	3.4E-02	1.5E-05	1.5E-02	1.5E-02
Nitrate as nitrogen	NS	NS	NS	NS	NS	NS
Selenium	1.1E-03	1.6E-01	1.6E-01	3.6E-04	6.8E-02	6.9E-02
Silver	2.0E-03	5.2E-01	5.2E-01	6.9E-04	2.2E-01	2.2E-01
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	1.7E-02	2.6E+00	2.7E+00	5.9E-03	1.1E+00	1.1E+00
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	4.8E-02	7.5E+00	7.6E+00	1.6E-02	3.2E+00	3.2E+00
MW-34-80						
Aluminum	2.6E-05	3.9E-03	3.9E-03	8.7E-06	1.7E-03	1.7E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	1.8E-03	2.8E-01	2.8E-01	6.2E-04	1.2E-01	1.2E-01
Copper	1.1E-04	1.7E-02	1.7E-02	3.8E-05	7.3E-03	7.3E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	3.4E-05	2.6E-02	2.6E-02	1.2E-05	1.1E-02	1.1E-02
Nitrate as nitrogen	NS	NS	NS	NS	NS	NS
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.0E-03	3.2E-01	3.3E-01	6.8E-04	1.4E-01	1.4E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-34-100						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.0E-01	1.5E+01	1.5E+01	6.8E-02	6.5E+00	6.6E+00
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.1E-03	4.7E-01	4.7E-01	1.0E-03	2.0E-01	2.0E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.0E-01	1.6E+01	1.6E+01	6.9E-02	6.7E+00	6.8E+00
MW-35-60						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.0E-02	7.9E-01	8.0E-01	3.5E-03	3.4E-01	3.4E-01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.0E-02	7.9E-01	8.0E-01	3.5E-03	3.4E-01	3.4E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-35-135						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	7.4E-03	5.6E-01	5.7E-01	2.5E-03	2.4E-01	2.4E-01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	7.4E-03	5.6E-01	5.7E-01	2.5E-03	2.4E-01	2.4E-01
MW-36-90						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	7.2E-01	5.4E+01	5.5E+01	2.4E-01	2.3E+01	2.3E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	7.2E-01	5.4E+01	5.5E+01	2.4E-01	2.3E+01	2.3E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-36-100						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	4.4E-01	3.3E+01	3.3E+01	1.5E-01	1.4E+01	1.4E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	4.4E-01	3.3E+01	3.3E+01	1.5E-01	1.4E+01	1.4E+01
MW-37D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	4.4E-01	3.4E+01	3.4E+01	1.5E-01	1.4E+01	1.5E+01
Cobalt	1.6E-03	2.5E-01	2.5E-01	5.6E-04	1.1E-01	1.1E-01
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.0E-03	6.0E-01	6.1E-01	1.4E-03	2.6E-01	2.6E-01
Nickel	1.1E-04	8.1E-02	8.1E-02	3.6E-05	3.5E-02	3.5E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	4.5E-01	3.4E+01	3.5E+01	1.5E-01	1.5E+01	1.5E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-38S						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	2.5E-01	1.9E+01	1.9E+01	8.4E-02	8.1E+00	8.2E+00
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	5.4E-03	8.1E-01	8.2E-01	1.8E-03	3.5E-01	3.5E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	2.8E-03	4.2E-01	4.2E-01	9.4E-04	1.8E-01	1.8E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.6E-01	2.0E+01	2.0E+01	8.7E-02	8.6E+00	8.7E+00
MW-38D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	6.2E-02	4.7E+00	4.7E+00	2.1E-02	2.0E+00	2.0E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	6.7E-03	1.0E+00	1.0E+00	2.3E-03	4.4E-01	4.4E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	3.9E-03	5.9E-01	5.9E-01	1.3E-03	2.5E-01	2.5E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	7.2E-02	6.3E+00	6.3E+00	2.4E-02	2.7E+00	2.7E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-39-50						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	4.7E-01	3.6E+01	3.6E+01	1.6E-01	1.5E+01	1.6E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	1.7E-03	2.5E-01	2.5E-01	5.6E-04	1.1E-01	1.1E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	4.7E-01	3.6E+01	3.7E+01	1.6E-01	1.5E+01	1.6E+01
MW-39-60						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	8.2E-01	6.2E+01	6.3E+01	2.8E-01	2.7E+01	2.7E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.7E-03	2.5E-01	2.5E-01	5.6E-04	1.1E-01	1.1E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	8.2E-01	6.2E+01	6.3E+01	2.8E-01	2.7E+01	2.7E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-39-70						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.2E+00	9.1E+01	9.3E+01	4.1E-01	3.9E+01	4.0E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	2.4E-03	3.6E-01	3.6E-01	8.0E-04	1.5E-01	1.5E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.2E+00	9.2E+01	9.3E+01	4.1E-01	3.9E+01	4.0E+01
MW-39-80						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.2E+00	9.4E+01	9.5E+01	4.2E-01	4.0E+01	4.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	2.3E-03	3.6E-01	3.6E-01	8.0E-04	1.5E-01	1.5E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.2E+00	9.4E+01	9.5E+01	4.2E-01	4.0E+01	4.1E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-39-100						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	2.2E+00	1.7E+02	1.7E+02	7.5E-01	7.2E+01	7.3E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	2.6E-03	3.9E-01	3.9E-01	8.8E-04	1.7E-01	1.7E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	2.2E+00	1.7E+02	1.7E+02	7.5E-01	7.2E+01	7.3E+01
MW-40S						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.7E-03	2.6E-01	2.7E-01	5.9E-04	1.1E-01	1.1E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.7E-03	2.6E-01	2.7E-01	5.9E-04	1.1E-01	1.1E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-40D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	2.3E-02	1.8E+00	1.8E+00	7.9E-03	7.6E-01	7.7E-01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	3.9E-03	5.9E-01	5.9E-01	1.3E-03	2.5E-01	2.5E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	5.2E-03	7.9E-01	7.9E-01	1.8E-03	3.4E-01	3.4E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	3.2E-02	3.1E+00	3.2E+00	1.1E-02	1.3E+00	1.4E+00
MW-43-25						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	3.4E-02	5.2E+00	5.2E+00	1.2E-02	2.2E+00	2.2E+00
Barium	ND	ND	ND	ND	ND	ND
Beryllium	2.3E-04	3.5E-02	3.5E-02	7.9E-05	1.5E-02	1.5E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	NS	NS	NS	NS	NS	NS
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	3.5E-02	5.2E+00	5.3E+00	1.2E-02	2.2E+00	2.3E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-44-115						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	3.8E-01	2.9E+01	2.9E+01	1.3E-01	1.2E+01	1.2E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	7.2E-03	1.1E+00	1.1E+00	2.4E-03	4.7E-01	4.7E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	3.9E-01	3.0E+01	3.0E+01	1.3E-01	1.3E+01	1.3E+01
MW-44-125						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.1E-01	8.1E+00	8.2E+00	3.6E-02	3.5E+00	3.5E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	1.1E-02	1.6E+00	1.6E+00	3.6E-03	6.8E-01	6.9E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.7E-03	2.6E-01	2.6E-01	5.7E-04	1.1E-01	1.1E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.2E-01	9.9E+00	1.0E+01	4.0E-02	4.2E+00	4.3E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-45-095a						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	7.3E-02	5.5E+00	5.6E+00	2.5E-02	2.4E+00	2.4E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	7.3E-02	5.5E+00	5.6E+00	2.5E-02	2.4E+00	2.4E+00
MW-46-175						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	5.0E-02	3.8E+00	3.8E+00	1.7E-02	1.6E+00	1.6E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	1.7E-02	2.5E+00	2.5E+00	5.6E-03	1.1E+00	1.1E+00
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	6.6E-02	6.3E+00	6.3E+00	2.2E-02	2.7E+00	2.7E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-47-55						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.5E-02	1.2E+00	1.2E+00	5.2E-03	5.0E-01	5.1E-01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.5E-02	1.2E+00	1.2E+00	5.2E-03	5.0E-01	5.1E-01
MW-50-095						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	7.7E-02	5.8E+00	5.9E+00	2.6E-02	2.5E+00	2.5E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	7.7E-02	5.8E+00	5.9E+00	2.6E-02	2.5E+00	2.5E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
MW-50-200						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	3.1E+00	2.3E+02	2.4E+02	1.0E+00	9.9E+01	1.0E+02
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.6E-03	6.9E-01	6.9E-01	1.5E-03	3.0E-01	3.0E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.6E-03	2.4E-01	2.4E-01	5.4E-04	1.0E-01	1.0E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	3.1E+00	2.3E+02	2.4E+02	1.0E+00	1.0E+02	1.0E+02
MW-51						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.3E+00	1.0E+02	1.0E+02	4.5E-01	4.3E+01	4.3E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.4E-03	5.1E-01	5.1E-01	1.1E-03	2.2E-01	2.2E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	3.7E-03	5.6E-01	5.7E-01	1.3E-03	2.4E-01	2.4E-01
Selenium	1.5E-03	2.3E-01	2.3E-01	5.2E-04	1.0E-01	1.0E-01
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.3E+00	1.0E+02	1.0E+02	4.5E-01	4.3E+01	4.4E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-1S						
Aluminum	5.0E-05	7.5E-03	7.6E-03	1.7E-05	3.2E-03	3.2E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	5.0E-05	7.5E-03	7.6E-03	1.7E-05	3.2E-03	3.2E-03
OW-1M						
Aluminum	4.7E-05	7.1E-03	7.1E-03	1.6E-05	3.0E-03	3.1E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	5.3E-04	8.0E-02	8.0E-02	1.8E-04	3.4E-02	3.4E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	2.2E-04	3.4E-02	3.4E-02	7.5E-05	1.4E-02	1.4E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	8.0E-04	1.2E-01	1.2E-01	2.7E-04	5.2E-02	5.2E-02

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-1D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	5.9E-04	8.9E-02	9.0E-02	2.0E-04	3.8E-02	3.9E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	2.3E-04	3.5E-02	3.5E-02	7.7E-05	1.5E-02	1.5E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.7E-03	4.1E-01	4.2E-01	9.3E-04	1.8E-01	1.8E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	4.5E-03	6.9E-01	6.9E-01	1.5E-03	2.9E-01	3.0E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	8.1E-03	1.2E+00	1.2E+00	2.7E-03	5.3E-01	5.3E-01
OW-2S						
Aluminum	6.4E-05	9.7E-03	9.8E-03	2.2E-05	4.2E-03	4.2E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	3.8E-04	5.8E-02	5.8E-02	1.3E-04	2.5E-02	2.5E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.1E-02	8.5E-01	8.6E-01	3.8E-03	3.6E-01	3.7E-01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.0E-03	6.1E-01	6.1E-01	1.4E-03	2.6E-01	2.6E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.3E-03	2.0E-01	2.0E-01	4.4E-04	8.4E-02	8.5E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.7E-02	1.7E+00	1.7E+00	5.7E-03	7.4E-01	7.4E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-2M						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	4.9E-04	7.4E-02	7.4E-02	1.6E-04	3.2E-02	3.2E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	2.2E-04	3.3E-02	3.3E-02	7.4E-05	1.4E-02	1.4E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	9.3E-04	1.4E-01	1.4E-01	3.1E-04	6.0E-02	6.1E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.6E-03	2.5E-01	2.5E-01	5.5E-04	1.1E-01	1.1E-01
OW-2D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	4.9E-04	7.4E-02	7.4E-02	1.6E-04	3.2E-02	3.2E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	2.0E-04	3.0E-02	3.0E-02	6.7E-05	1.3E-02	1.3E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.5E-03	5.3E-01	5.3E-01	1.2E-03	2.3E-01	2.3E-01
Nickel	5.7E-05	4.3E-02	4.3E-02	1.9E-05	1.8E-02	1.9E-02
Nitrate as nitrogen	1.3E-03	1.9E-01	1.9E-01	4.3E-04	8.3E-02	8.3E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	4.3E-04	1.1E-01	1.1E-01	1.5E-04	4.7E-02	4.7E-02
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	5.9E-03	9.8E-01	9.8E-01	2.0E-03	4.2E-01	4.2E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-3D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.7E-03	5.6E-01	5.6E-01	1.2E-03	2.4E-01	2.4E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	3.7E-03	5.6E-01	5.6E-01	1.2E-03	2.4E-01	2.4E-01
OW-5S						
Aluminum	4.2E-05	6.3E-03	6.4E-03	1.4E-05	2.7E-03	2.7E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	7.5E-03	5.7E-01	5.8E-01	2.5E-03	2.4E-01	2.5E-01
Cobalt	1.8E-03	2.7E-01	2.7E-01	6.0E-04	1.1E-01	1.1E-01
Copper	1.6E-04	2.4E-02	2.4E-02	5.4E-05	1.0E-02	1.0E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.2E-03	1.8E-01	1.8E-01	4.0E-04	7.7E-02	7.7E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	3.3E-03	8.3E-01	8.3E-01	1.1E-03	3.6E-01	3.6E-01
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.4E-02	1.9E+00	1.9E+00	4.7E-03	8.0E-01	8.1E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
OW-5M						
Aluminum	3.2E-04	4.8E-02	4.8E-02	1.1E-04	2.1E-02	2.1E-02
Antimony	1.2E-02	1.8E+00	1.8E+00	4.0E-03	7.6E-01	7.6E-01
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	1.9E-03	2.8E-01	2.8E-01	6.3E-04	1.2E-01	1.2E-01
Cadmium	8.9E-03	1.3E+00	1.4E+00	3.0E-03	5.8E-01	5.8E-01
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	1.4E-02	2.1E+00	2.1E+00	4.8E-03	9.1E-01	9.2E-01
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.7E-03	4.0E-01	4.1E-01	9.0E-04	1.7E-01	1.7E-01
Nickel	8.5E-05	6.4E-02	6.4E-02	2.9E-05	2.8E-02	2.8E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	1.6E-03	2.4E-01	2.4E-01	5.3E-04	1.0E-01	1.0E-01
Silver	1.0E-03	2.6E-01	2.6E-01	3.4E-04	1.1E-01	1.1E-01
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	3.7E-03	5.6E-01	5.6E-01	1.2E-03	2.4E-01	2.4E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	4.6E-02	7.1E+00	7.1E+00	1.6E-02	3.0E+00	3.1E+00
OW-5D						
Aluminum	8.5E-05	1.3E-02	1.3E-02	2.9E-05	5.5E-03	5.6E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	5.3E-04	8.0E-02	8.0E-02	1.8E-04	3.4E-02	3.4E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.6E-04	2.4E-02	2.4E-02	5.4E-05	1.0E-02	1.0E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.0E-03	6.1E-01	6.1E-01	1.4E-03	2.6E-01	2.6E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	4.3E-03	6.5E-01	6.6E-01	1.5E-03	2.8E-01	2.8E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	9.1E-03	1.4E+00	1.4E+00	3.1E-03	5.9E-01	5.9E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PE-1						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	2.8E-02	2.1E+00	2.2E+00	9.5E-03	9.1E-01	9.2E-01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	2.8E-02	2.1E+00	2.2E+00	9.5E-03	9.1E-01	9.2E-01
PGE-6						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	3.3E-01	2.5E+01	2.6E+01	1.1E-01	1.1E+01	1.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	1.5E-04	2.3E-02	2.3E-02	5.1E-05	9.9E-03	9.9E-03
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	2.6E-05	2.0E-02	2.0E-02	9.0E-06	8.6E-03	8.6E-03
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	5.7E-04	1.4E-01	1.4E-01	1.9E-04	6.2E-02	6.2E-02
Cumulative noncancer hazard index	3.3E-01	2.5E+01	2.6E+01	1.1E-01	1.1E+01	1.1E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PGE-7						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.6E+00	1.2E+02	1.2E+02	5.3E-01	5.1E+01	5.2E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	2.0E-04	3.1E-02	3.1E-02	6.9E-05	1.3E-02	1.3E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	4.7E-03	7.2E-01	7.2E-01	1.6E-03	3.1E-01	3.1E-01
Nickel	3.3E-05	2.5E-02	2.5E-02	1.1E-05	1.1E-02	1.1E-02
Nitrate as nitrogen	2.7E-03	4.1E-01	4.2E-01	9.3E-04	1.8E-01	1.8E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	4.4E-05	1.1E-02	1.1E-02	1.5E-05	4.8E-03	4.8E-03
Cumulative noncancer hazard index	1.6E+00	1.2E+02	1.2E+02	5.3E-01	5.1E+01	5.2E+01
PGE-8						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	ND	ND	ND	ND	ND	ND
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	NS	NS	NS	NS	NS	NS
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	6.6E-03	1.0E+00	1.0E+00	2.2E-03	4.3E-01	4.3E-01
Nickel	5.6E-05	4.3E-02	4.3E-02	1.9E-05	1.8E-02	1.8E-02
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	2.6E-04	6.6E-02	6.6E-02	8.9E-05	2.8E-02	2.8E-02
Cumulative noncancer hazard index	6.9E-03	1.1E+00	1.1E+00	2.3E-03	4.7E-01	4.8E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
Park Moabi-4						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	6.8E-03	1.0E+00	1.0E+00	2.3E-03	4.4E-01	4.5E-01
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	5.1E-04	1.3E-01	1.3E-01	1.7E-04	5.5E-02	5.5E-02
Cumulative noncancer hazard index	7.3E-03	1.2E+00	1.2E+00	2.5E-03	5.0E-01	5.0E-01
PT-1D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	8.7E-01	6.6E+01	6.6E+01	2.9E-01	2.8E+01	2.8E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	8.7E-01	6.6E+01	6.6E+01	2.9E-01	2.8E+01	2.8E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-2D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	6.5E-01	4.9E+01	5.0E+01	2.2E-01	2.1E+01	2.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	6.5E-01	4.9E+01	5.0E+01	2.2E-01	2.1E+01	2.1E+01
PT-3D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.2E+00	9.5E+01	9.6E+01	4.2E-01	4.1E+01	4.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.2E+00	9.5E+01	9.6E+01	4.2E-01	4.1E+01	4.1E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-4D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.7E+00	1.3E+02	1.3E+02	5.7E-01	5.4E+01	5.5E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.7E+00	1.3E+02	1.3E+02	5.7E-01	5.4E+01	5.5E+01
PT-5D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.7E+00	1.3E+02	1.3E+02	5.9E-01	5.6E+01	5.7E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.7E+00	1.3E+02	1.3E+02	5.9E-01	5.6E+01	5.7E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-6D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	9.3E-01	7.1E+01	7.1E+01	3.2E-01	3.0E+01	3.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	9.3E-01	7.1E+01	7.1E+01	3.2E-01	3.0E+01	3.1E+01
PT-7S						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	3.4E-01	2.6E+01	2.6E+01	1.1E-01	1.1E+01	1.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	5.8E-03	8.8E-01	8.8E-01	2.0E-03	3.8E-01	3.8E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	3.4E-01	2.6E+01	2.7E+01	1.2E-01	1.1E+01	1.1E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-7M						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	6.5E-01	4.9E+01	5.0E+01	2.2E-01	2.1E+01	2.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	6.6E-03	1.0E+00	1.0E+00	2.3E-03	4.3E-01	4.3E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	6.6E-01	5.0E+01	5.1E+01	2.2E-01	2.2E+01	2.2E+01
PT-7D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	2.0E+00	1.5E+02	1.6E+02	6.9E-01	6.6E+01	6.7E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	2.0E-03	3.0E-01	3.0E-01	6.6E-04	1.3E-01	1.3E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	2.0E+00	1.5E+02	1.6E+02	6.9E-01	6.6E+01	6.7E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-8S						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	4.9E-01	3.7E+01	3.8E+01	1.7E-01	1.6E+01	1.6E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	6.6E-03	1.0E+00	1.0E+00	2.2E-03	4.3E-01	4.3E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	5.0E-01	3.8E+01	3.9E+01	1.7E-01	1.6E+01	1.7E+01
PT-8M						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.1E+00	8.4E+01	8.5E+01	3.8E-01	3.6E+01	3.7E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	8.4E-03	1.3E+00	1.3E+00	2.8E-03	5.4E-01	5.5E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.1E+00	8.6E+01	8.7E+01	3.8E-01	3.7E+01	3.7E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-8D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.8E+00	1.4E+02	1.4E+02	6.2E-01	6.0E+01	6.0E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	2.6E-03	3.9E-01	3.9E-01	8.7E-04	1.7E-01	1.7E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.8E+00	1.4E+02	1.4E+02	6.2E-01	6.0E+01	6.1E+01
PT-9S						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	3.3E-01	2.5E+01	2.5E+01	1.1E-01	1.1E+01	1.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	4.3E-03	6.6E-01	6.6E-01	1.5E-03	2.8E-01	2.8E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	3.4E-01	2.6E+01	2.6E+01	1.1E-01	1.1E+01	1.1E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PT-9M						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	6.6E-01	5.0E+01	5.1E+01	2.2E-01	2.1E+01	2.2E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	6.5E-03	9.8E-01	9.9E-01	2.2E-03	4.2E-01	4.2E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	6.6E-01	5.1E+01	5.2E+01	2.3E-01	2.2E+01	2.2E+01
PT-9D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	4.4E+00	3.3E+02	3.4E+02	1.5E+00	1.4E+02	1.4E+02
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	2.5E-03	3.7E-01	3.7E-01	8.3E-04	1.6E-01	1.6E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	4.4E+00	3.3E+02	3.4E+02	1.5E+00	1.4E+02	1.5E+02

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PTI-1D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	9.4E-01	7.1E+01	7.2E+01	3.2E-01	3.1E+01	3.1E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	9.4E-01	7.1E+01	7.2E+01	3.2E-01	3.1E+01	3.1E+01
PTR-1						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.5E-01	1.1E+01	1.2E+01	5.1E-02	4.9E+00	5.0E+00
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	4.9E-03	7.4E-01	7.4E-01	1.6E-03	3.2E-01	3.2E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.6E-01	1.2E+01	1.2E+01	5.3E-02	5.2E+00	5.3E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
PTR-2						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	9.0E-01	6.8E+01	6.9E+01	3.0E-01	2.9E+01	2.9E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	6.8E-03	1.0E+00	1.0E+00	2.3E-03	4.4E-01	4.4E-01
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	9.0E-01	6.9E+01	7.0E+01	3.1E-01	3.0E+01	3.0E+01
TW-1						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.3E+00	9.8E+01	1.0E+02	4.4E-01	4.2E+01	4.3E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.4E-03	2.2E-01	2.2E-01	4.8E-04	9.3E-02	9.3E-02
Selenium	1.3E-02	2.0E+00	2.0E+00	4.4E-03	8.5E-01	8.5E-01
Silver	4.4E-03	1.1E+00	1.1E+00	1.5E-03	4.8E-01	4.8E-01
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	9.3E-05	2.3E-02	2.4E-02	3.1E-05	1.0E-02	1.0E-02
Cumulative noncancer hazard index	1.3E+00	1.0E+02	1.0E+02	4.5E-01	4.4E+01	4.4E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
TW-2S						
Aluminum	5.9E-05	9.0E-03	9.1E-03	2.0E-05	3.9E-03	3.9E-03
Antimony	1.6E-01	2.4E+01	2.5E+01	5.5E-02	1.0E+01	1.1E+01
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.4E+00	1.0E+02	1.1E+02	4.6E-01	4.4E+01	4.5E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.8E-03	2.7E-01	2.7E-01	6.0E-04	1.1E-01	1.2E-01
Selenium	1.7E-03	2.6E-01	2.6E-01	5.7E-04	1.1E-01	1.1E-01
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	1.8E-04	4.6E-02	4.6E-02	6.2E-05	2.0E-02	2.0E-02
Cumulative noncancer hazard index	1.5E+00	1.3E+02	1.3E+02	5.2E-01	5.5E+01	5.6E+01
TW-2D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	1.6E-01	2.5E+01	2.5E+01	5.5E-02	1.1E+01	1.1E+01
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	1.5E+00	1.2E+02	1.2E+02	5.3E-01	5.0E+01	5.1E+01
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	4.2E-03	6.4E-01	6.4E-01	1.4E-03	2.7E-01	2.8E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	ND	ND	ND	ND	ND	ND
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.7E+00	1.4E+02	1.4E+02	5.8E-01	6.1E+01	6.2E+01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
TW-3D						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	ND	ND	ND	ND	ND	ND
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	8.0E-01	6.0E+01	6.1E+01	2.7E-01	2.6E+01	2.6E+01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	8.0E-01	6.0E+01	6.1E+01	2.7E-01	2.6E+01	2.6E+01
TW-4						
Aluminum	NS	NS	NS	NS	NS	NS
Antimony	NS	NS	NS	NS	NS	NS
Arsenic	NS	NS	NS	NS	NS	NS
Barium	NS	NS	NS	NS	NS	NS
Beryllium	NS	NS	NS	NS	NS	NS
Cadmium	NS	NS	NS	NS	NS	NS
Chromium, hexavalent	1.0E-02	7.6E-01	7.7E-01	3.4E-03	3.2E-01	3.3E-01
Cobalt	NS	NS	NS	NS	NS	NS
Copper	NS	NS	NS	NS	NS	NS
Fluoride	NS	NS	NS	NS	NS	NS
Mercury	NS	NS	NS	NS	NS	NS
Molybdenum	NS	NS	NS	NS	NS	NS
Nickel	NS	NS	NS	NS	NS	NS
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	NS	NS	NS	NS	NS	NS
Silver	NS	NS	NS	NS	NS	NS
Thallium	NS	NS	NS	NS	NS	NS
Vanadium	NS	NS	NS	NS	NS	NS
Zinc	NS	NS	NS	NS	NS	NS
Cumulative noncancer hazard index	1.0E-02	7.6E-01	7.7E-01	3.4E-03	3.2E-01	3.3E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-1M						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	5.9E-03	8.9E-01	9.0E-01	2.0E-03	3.8E-01	3.8E-01
Zinc	2.1E-04	5.3E-02	5.3E-02	7.1E-05	2.3E-02	2.3E-02
Cumulative noncancer hazard index	6.1E-03	9.5E-01	9.5E-01	2.1E-03	4.1E-01	4.1E-01
CW-1D						
Aluminum	5.0E-05	7.5E-03	7.6E-03	1.7E-05	3.2E-03	3.2E-03
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	5.1E-04	7.7E-02	7.7E-02	1.7E-04	3.3E-02	3.3E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.4E-03	5.2E-01	5.2E-01	1.2E-03	2.2E-01	2.2E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	5.4E-03	8.2E-01	8.2E-01	1.8E-03	3.5E-01	3.5E-01
Zinc	9.5E-05	2.4E-02	2.4E-02	3.2E-05	1.0E-02	1.0E-02
Cumulative noncancer hazard index	9.4E-03	1.4E+00	1.4E+00	3.2E-03	6.2E-01	6.2E-01

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-2M						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	ND	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	7.5E-03	1.1E+00	1.1E+00	2.5E-03	4.9E-01	4.9E-01
Zinc	1.8E-04	4.6E-02	4.6E-02	6.1E-05	2.0E-02	2.0E-02
Cumulative noncancer hazard index	7.7E-03	1.2E+00	1.2E+00	2.6E-03	5.0E-01	5.1E-01
CW-2D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	5.1E-04	7.7E-02	7.7E-02	1.7E-04	3.3E-02	3.3E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	3.1E-02	4.6E+00	4.7E+00	1.0E-02	2.0E+00	2.0E+00
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	5.2E-03	7.8E-01	7.9E-01	1.8E-03	3.4E-01	3.4E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	7.3E-03	1.1E+00	1.1E+00	2.5E-03	4.7E-01	4.8E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	4.4E-02	6.6E+00	6.7E+00	1.5E-02	2.8E+00	2.8E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-3M						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	4.0E-04	6.1E-02	6.1E-02	1.4E-04	2.6E-02	2.6E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	2.5E-03	3.8E-01	3.8E-01	8.5E-04	1.6E-01	1.6E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	1.1E-03	1.7E-01	1.7E-01	3.8E-04	7.3E-02	7.3E-02
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	5.9E-03	9.0E-01	9.0E-01	2.0E-03	3.8E-01	3.9E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.0E-02	1.5E+00	1.5E+00	3.4E-03	6.5E-01	6.5E-01
CW-3D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	5.1E-04	7.7E-02	7.7E-02	1.7E-04	3.3E-02	3.3E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	ND	ND	ND	ND	ND	ND
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	5.5E-03	8.3E-01	8.4E-01	1.9E-03	3.6E-01	3.6E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	7.8E-03	1.2E+00	1.2E+00	2.6E-03	5.1E-01	5.1E-01
Vanadium	6.9E-03	1.1E+00	1.1E+00	2.3E-03	4.5E-01	4.5E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	2.1E-02	3.1E+00	3.2E+00	7.0E-03	1.3E+00	1.4E+00

Table O-2. Estimated Potential Noncancer Hazard Indices – Hypothetical Future Child Groundwater User – Well-Specific

	Groundwater Noncancer Hazard Indices					
	On-Site Resident Child			On-Site Resident Adult		
Chemical of Potential Concern	Dermal Contact	Ingestion	Total Hazard	Dermal Contact	Ingestion	Total Hazard
CW-4M						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	3.4E-04	5.1E-02	5.1E-02	1.1E-04	2.2E-02	2.2E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	2.3E-04	3.5E-02	3.5E-02	7.8E-05	1.5E-02	1.5E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	ND	ND	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	5.7E-03	8.7E-01	8.8E-01	1.9E-03	3.7E-01	3.7E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	6.3E-03	9.6E-01	9.6E-01	2.1E-03	4.1E-01	4.1E-01
CW-4D						
Aluminum	ND	ND	ND	ND	ND	ND
Antimony	ND	ND	ND	ND	ND	ND
Arsenic	ND	ND	ND	ND	ND	ND
Barium	ND	ND	ND	ND	ND	ND
Beryllium	4.2E-04	6.4E-02	6.4E-02	1.4E-04	2.7E-02	2.8E-02
Cadmium	ND	ND	ND	ND	ND	ND
Chromium, hexavalent	ND	ND	ND	ND	ND	ND
Cobalt	ND	ND	ND	ND	ND	ND
Copper	1.6E-04	2.5E-02	2.5E-02	5.5E-05	1.1E-02	1.1E-02
Fluoride	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND
Molybdenum	3.6E-03	5.4E-01	5.4E-01	1.2E-03	2.3E-01	2.3E-01
Nickel	ND	ND	ND	ND	ND	ND
Nitrate as nitrogen	ND	ND	ND	ND	ND	ND
Selenium	ND	ND	ND	ND	ND	ND
Silver	ND	ND	ND	ND	ND	ND
Thallium	ND	ND	ND	ND	ND	ND
Vanadium	6.6E-03	1.0E+00	1.0E+00	2.2E-03	4.3E-01	4.3E-01
Zinc	ND	ND	ND	ND	ND	ND
Cumulative noncancer hazard index	1.1E-02	1.6E+00	1.6E+00	3.6E-03	7.0E-01	7.0E-01

Notes:

ND = not detected or not detected above background concentrations
NS = not sampled

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Appendix P

Determination of Material Contributors to Elevated Cumulative Noncancer Hazard at Individual Groundwater Wells

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Infrastructure, environment, buildings

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Appendix P – Determination of Material Contributors to Elevated Cumulative Noncancer Hazard at Individual Groundwater Wells

HERA of Groundwater Impacted by Activities at
SWMU 1/AOC 1 and SWMU 2
Topock Compressor Station, Needles, California

November 2009

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Tables

P-1 Well-by-Well Hazard Characterization Summary

P-2 Well-by-Well Lead Summary

Acronyms and Abbreviations

AOC	Area of Concern
CAL	California Action Level
CalEPA	California Environmental Protection Agency
COPC	constituent of potential concern
EPC	exposure point concentration
HI	hazard index
IM	Interim Measure
mg/L	milligram(s) per liter
OTM	of the mean
SWMU	Solid Waste Management Unit
UCL	upper confidence limit
UTL	upper tolerance limit

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Appendix P

Determination of Material Contributors to Elevated Cumulative Noncancer Hazard at Individual Groundwater Wells

1. Introduction

At each site groundwater well included in the well-specific groundwater risk assessment (see Section 7.1 of the Human Health and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2 [main text]), an estimated potential noncancer hazard index (HI) for the future hypothetical child groundwater user is calculated for each chemical detected above background levels in the well, based on the estimated well-specific exposure point concentration (EPC) of that chemical. The cumulative noncancer HI at that well is calculated by summing the chemical-specific HI values. The results of this analysis are presented in Table 7-2 of the main text. It is evident that any estimated chemical-specific HI in excess of the threshold value of 1.0 is indicative of a potentially material impact with respect to that chemical at that well. Less obvious, however, is the significance of a chemical's contribution to cumulative (i.e., multi-chemical) noncancer hazard, particularly when the estimated chemical-specific HI is less than 1.0 and the cumulative HI for the well is greater than 1.0.

As described in Section 6.3 of the main text, the noncarcinogenic hazard from lead is not evaluated using the traditional reference dose approach because most human health effects data are based on blood-lead concentration rather than external dose (California Environmental Protection Agency [CalEPA], 1992). Therefore, the concept of contribution to cumulative hazard is not applicable to lead, and the noncancer health effects associated with lead are not included in the cumulative noncancer HI. Estimated well-specific lead EPCs are compared to the California Action Level[1] (CAL) for lead, which is a legally enforceable drinking water standard designed to protect public health. The ratio of the estimated lead EPC to the lead CAL is, therefore, approximately analogous to an HI; a ratio above the threshold value of 1.0 indicates potential for adverse health effects to the hypothetical future groundwater user.

The purpose of this appendix is to twofold:

1. Document the methodologies used to characterize the significance of:
   - Chemical-specific contributions to elevated cumulative hazard at individual wells
   - Lead impacts at individual wells.

[1] California Action Level for lead provided in CCR Title 22, Division 4, Chapter 17.5, Article 3, Section 64678

2. Identify, for each chemical, those specific groundwater wells where the chemical is determined to contribute materially to estimated noncancer hazard, and to provide additional analysis of those specific wells, to help evaluate the overall impact of the chemical on site groundwater.

The results of the process used to identify those constituents that contribute materially to an elevated noncancer hazard are summarized in Table 7-6 of the main text and are incorporated into the discussion of risk assessment results that is presented in Section 7.3 of the main text.

2. Methodology

2.1 Chemicals Other than Lead

Once the estimated potential noncancer HI for the hypothetical future child groundwater user is calculated for each chemical at a particular groundwater well (see Table 7-2 of the main text), the chemicals are ranked (i.e., the table of hazard results is sorted) by chemical-specific HI, from high to low. An example, using the results from well MW-24A, is provided in the table below; at this well, the estimated cumulative noncancer HI is 82. The chemicals detected at this well are ranked from highest (hexavalent chromium; HI of 73) to lowest (nickel; HI of 0.021) noncancer hazard. Once the chemicals are ranked from high to low hazard contribution, a running cumulative (multi-chemical) HI is calculated for each chemical, starting with the lowest noncancer hazard, as illustrated in the table below. The chemical that pushes the cumulative hazard above the threshold value of 1.0 is identified; in the example shown below, this chemical is selenium. A "line is drawn" before (under) this chemical (see dashed line in example below).

Those chemicals that fall "below the line" are determined to not be material contributors to cumulative hazard at this well (e.g., as shown below, nickel, copper, zinc, barium, and molybdenum combine to produce a cumulative HI of 0.90) and, therefore, it may be concluded these chemicals, even in combination, are not contributing materially to cumulative noncancer hazard at this well. Those chemicals that fall "above the line" are determined to be potentially material contributors to cumulative hazard at this well. Note, in the example shown below, two chemicals – selenium and nitrate as nitrogen – are determined to be material contributors to cumulative noncancer hazard at this well, even though their estimated chemical-specific HIs are below the threshold value of 1.0. As discussed above, the overall purpose of this ranking process is to identify those chemicals that individually may be determined to be below a level of concern, but where the cumulative impact associated with the presence of the chemical, in combination with the others, could potentially alter the overall conclusion of risk at that location.

Example Determination: Well MW-24A

COPC	Chemical-specific Hazard	Cumulative Hazard	
Chromium, hexavalent	73	82	Are material contributors to cumulative hazard
Arsenic	7.2	9.5	
Nitrate as nitrogen	0.74	2.3	
Selenium	0.65	1.6	
Molybdenum	0.51	0.90	Are not material contributors to cumulative hazard
Barium	0.30	0.39	
Zinc	0.045	0.089	
Copper	0.023	0.044	
Nickel	0.021	0.021	

2.2 Lead

As described above, the concept of contribution to cumulative hazard is not applicable to lead; the significance of lead in groundwater is evaluated individually by comparison of estimated well-specific lead EPCs to the CAL for lead of 0.015 milligrams per liter (mg/L). These results are presented in Table 7-5 of the main text. Lead is determined to be of potential concern at those individual wells with an estimated lead EPC greater than the CAL (i.e., with a ratio of EPC to CAL greater than 1.0).

3. Application to Risk Assessment

3.1 Chemicals Other than Lead

The process of identifying constituents contributing materially to elevated noncancer hazard described above is performed for all groundwater wells included in the well-specific groundwater risk assessment that is presented in Section 7.1 of the main text. For each constituent of potential concern (COPC) included in the well-specific assessment, the number of wells at which the COPC is determined to be a material contributor to cumulative hazard is tallied. The results of this tally are summarized in Table 7-6 of the main text, in the column titled, “Number of Wells Exceeding Cumulative Hazard Threshold.” This information describes the frequency at which each COPC materially contributes to elevated noncancer hazard, and is referenced in the risk characterization discussion presented in Section 7.3 of the main text. For each chemical that is a material contributor to any well, an average HI is calculated. The calculation averages the HI of that chemical from each well where it was determined to contribute materially to cumulative hazard. These average HI values are summarized in Table 7-6 of the main text, in the column titled, “Average Hazard Index at Wells where Chemical is Driving Risk.” This information describes the magnitude at which each COPC contributes to elevated noncancer hazard and is referenced in the risk characterization discussion presented in Section 7.3 of the main text.

3.2 Lead

The process for lead described above is performed for all groundwater wells included in the well-specific groundwater risk assessment that is presented in Section 7.1 of the main text. The number of wells at which the estimated lead EPC exceeds the lead CAL is tallied in Table 7-6 of the main text in the column titled “Number of Wells Exceeding Cumulative Hazard Threshold.” This information describes the frequency at which lead has been detected in site groundwater wells at concentrations in excess of the CAL and is referenced in the risk characterization discussion presented in Section 7.3 of the main text. The average ratio of lead EPC to lead CAL at those wells where the ratio exceeds 1.0 is also calculated and presented in Table 7-6 of the main text, in the column titled, “Average Hazard Index at Wells where Chemical is Driving Risk.” (Note, these column headings are misnomers, with respect to lead because the ratio is not an HI.) This information describes the magnitude of those exceedances and is referenced in the risk characterization discussion presented in Section 7.3 of the main text.

4. Application to Sensitivity Risk Assessment

4.1 Chemicals Other than Lead

The process of identifying constituents contributing materially to elevated noncancer hazard described earlier is also performed for all groundwater wells included in the sensitivity well-specific groundwater risk assessment that is presented in Appendix G. As described in Appendix G, the sensitivity risk assessment bases COPC EPCs on average, rather than maximum, detected concentrations for those datasets with too few results (fewer than eight results or fewer than five detections) to allow calculation of a 95 percent upper confidence (95% UCL) of the mean (OTM) with ProUCL 4.0. The number of wells at which the COPC is determined to be a material contributor to cumulative hazard is tallied; the results of this tally are summarized in Table 7-6 of the main text, in the column titled, “Number of Wells Exceeding Cumulative Hazard Threshold – Sensitivity Analysis.” Also calculated for each COPC is the average chemical-specific HI at those wells where the COPC is determined to be a material contributor to cumulative hazard; these average HI values are summarized in Table 7-6 of the main text, in the column titled, “Average Hazard Index at Wells where Chemical is Driving Risk – Sensitivity Analysis.” This information is referenced in the risk characterization discussion presented in Section 7.3 of the main text.

4.2 Lead

The process for lead described earlier is also performed for all groundwater wells included in the sensitivity well-specific groundwater risk assessment that is presented in Appendix G. The number of wells at which the lead EPC exceeds the lead CAL is tallied in Table 7-6 of the main text in the column titled “Number of Wells Exceeding Cumulative Hazard Threshold – Sensitivity Analysis.” The average ratio of lead EPC to lead CAL at those wells where ratio exceeds 1.0 is also calculated and presented in Table 7-6 of the main text, in the column titled, “Average Hazard Index at Wells where Chemical is Driving Risk – Sensitivity Analysis.” (Again, these column headings are misnomers, with respect to lead since the ratio is not an HI.) This information is referenced in the risk characterization discussion presented in Section 7.3 of the main text.

5. Well-by-Well Analysis of Material Contributors to Elevated Noncancer Hazard

Chemicals contributing materially to elevated noncancer hazard are identified for each site groundwater well by the methodologies described above. In addition, this section identifies each chemical determined to contribute materially to elevated cumulative noncancer hazard, and the list of wells so impacted by that chemical. Key information about each of these wells is presented in Table P-1. For the reader's convenience, the order in which the chemicals are presented in Table P-1 matches the order in which the chemicals are discussed in Section 7.3 of the main text. A well-by-well comparison of lead EPCs to the CAL is presented in Table P-2, for those wells where the lead EPC exceeds the CAL.

Also presented in Table P-1, for each chemical and well, is the number of nondetect results where the detection limit is above the risk-based concentration. Risk-based concentrations are calculated for each chemical in Appendix Q. High detection limits introduce uncertainties into the calculations, as discussed in Section 9 of the main text.

5.1 Barium

As shown in Table P-1, barium is a material contributor to elevated noncancer hazard at MW-23 (total HI of 2.2; barium-specific HI of 1.7) and MW-32-20 (total HI of 1.7; barium-specific HI of 1.7). At MW-23, barium was detected in three of eight samples; because there are too few data points to calculate a 95% UCL OTM, the EPC used in the well-specific risk assessment is the maximum detected concentration of 5.3 mg/L, which is an order of magnitude greater than the next highest detected concentration in that well of 0.28 mg/L. Similarly, at MW-32-20, barium was only analyzed for once and was detected at a concentration of 5.1 mg/L. Interestingly, aside from these two detections of approximately 5 mg/L, the next highest concentration of barium detected anywhere across the site is 1.1 mg/L (which, as indicated in Table 7-2, corresponds to an HI of 0.35), detected at MW-30-30. Barium was detected above 1.0 mg/L in only four of 559 total samples collected across the site (frequency of 0.72 percent) and was detected below 0.50 mg/L in 99 percent of all samples.

MW-23 is located to the east of the Topock Compressor Station, near the west bank of the Colorado River. MW-32-20 is located approximately 750 feet to the north of MW-23. Therefore, the two wells in which barium contributes materially to elevated noncancer hazard are geographically distinct from each other.

5.2 Cadmium

As shown in Table P-1, cadmium is a material contributor to elevated noncancer hazard at OW-5M (total HI 7.1; cadmium-specific HI of 1.4), where it was detected at a concentration of 0.011 mg/L in one of 14 samples collected at this location. The EPC used in the well-specific risk assessment is, therefore, the maximum detected concentration of 0.011 mg/L. Clearly this is an overly conservative assumption, particularly for a compound that has only been detected in one of 374 total samples. This is further supported by the sensitivity analysis presented in Appendix G, in which the estimated cadmium-specific HI at OW-5M is estimated to be 0.22, based on the average (rather than maximum) concentration. Cadmium is not a material contributor to elevated noncancer hazard at any wells in the sensitivity analysis. OW-5M is not in the hexavalent chromium plume.

5.3 Cobalt

As shown in Table P-1, cobalt is a material contributor to elevated noncancer hazard at MW-22 (total HI of 4.6; cobalt-specific HI of 1.1) and OW-5M (total HI of 7.1; cobalt-specific HI of 2.1). At each of these locations, however, cobalt was detected in only one sample, suggesting that the presence of cobalt, both across the site and at individual wells, is sporadic and inconsistent. Specifically, at MW-22 and OW-5M, cobalt was detected in one of three and one of 14 samples, respectively. As shown in the uncertainty analysis presented in Appendix G, use of the average rather than maximum concentrations results in estimated cobalt-specific HIs of 0.71 at MW-22 and 0.52 at OW-5M.

It is also informative to note that the two locations where cobalt contributes materially to cumulative noncancer hazard are not in close geographic proximity to each other; MW-22 is located in the area of the floodplain (although outside the hexavalent chromium groundwater plume) and OW-5M is located approximately 3,500 feet north-west, in the area of the Interim Measure (IM) injection well field (also outside the hexavalent chromium plume). Cobalt was either not detected or was detected below levels of concern for cumulative impacts in the wells surrounding both MW-22 and OW-5M. As indicated in Table 7-2, the estimated noncancer HIs are all at or below 0.28 for the other six wells where cobalt was detected above background levels.

5.4 Nickel

As shown in Table P-1, nickel is a material contributor to elevated noncancer hazard at MW-22 (total HI of 4.6; nickel-specific HI of 0.48) and MW-30-30 (total HI of 5.0; nickel-specific HI of 0.84). Both wells are outside the hexavalent chromium groundwater plume. The estimated nickel-specific HI does not exceed 1.0 at any location and is less than 0.1 (i.e., is more than an order of magnitude below the level of concern) at 30 (79 percent) of the 38 wells where nickel was detected above background levels. Sufficient nickel data is available at MW-22 and MW-30-30 to calculated EPCs as the 95% UCL OTM; therefore, nickel HIs in Appendix G do not change for MW-22 and MW-30-30.

5.5 Selenium

As shown in Table P-1, selenium is a material contributor to elevated noncancer hazard at TW-1 (total HI of 100; selenium-specific HI of 2.0) and MW-24A (total HI of 82; selenium-specific HI of 0.65). TW-1 and MW-24A are within the hexavalent chromium groundwater plume. The third-highest estimated selenium-specific HI is 0.49 (at MW-21) and the estimated selenium-specific HIs are all at or below 0.26 for the remaining 10 wells where selenium was detected above background levels. At TW-1, selenium was detected in four of four samples; because there are too few data points to calculate a 95% UCL OTM, the EPC used in the well-specific risk assessment is the maximum detected concentration of 0.16 mg/L. As shown in the uncertainty analysis presented in Appendix G, use of the average rather than maximum concentrations results in estimated selenium-specific HIs of 1.4 at TW-1 and 0.25 at MW-24A. Selenium is not a material contributor to elevated noncancer hazard at MW-24A in the sensitivity analysis.

5.6 Silver

As shown in Table P-1, silver is a material contributor to elevated noncancer hazard at TW-1 (total HI of 100; silver-specific HI of 1.1), MW-10 (total HI of 75; silver-specific HI of 0.79), and OW-5S (total HI of 1.9; silver-specific HI of 0.83). TW-1 and MW-10 are within the hexavalent chromium groundwater plume. In each of the seven wells where silver was detected above background levels, it was detected above the laboratory reporting limit in only one or two samples, suggesting that the presence of silver, both across the site and at individual wells, is sporadic and inconsistent. Further, as silver was only detected in one or two samples from each well, the EPCs used in the well-specific risk assessment are maximum detected concentrations (because there are too few data points to calculate 95% UCLs OTM). This is overly conservative for a compound that has been detected in only 2.1 percent of all groundwater samples, as

the bulk of the evidence indicates that silver is not actually present in site groundwater above the laboratory reporting limit. This is further supported by the sensitivity analysis presented in Appendix G, in which estimated silver-specific HIs are based on average, rather than maximum, concentrations. In Appendix G, estimated silver-specific HIs are 0.34 at TW-1, 0.069 at MW-10, and 0.081 at OW-5S. Silver is not a material contributor to elevated noncancer hazard at any wells in the sensitivity analysis.

5.7 Thallium

As shown in Table P-1, thallium is a material contributor to elevated noncancer hazard at MW-12 (total HI of 58; thallium-specific HI of 1.1) and CW-3D (total HI of 3.2; thallium-specific HI of 1.2). Thallium was detected in only one of 17 and one of seven samples in MW-12 and CW-3D, respectively, and was not detected anywhere else at the site.

The fact that thallium was detected above the laboratory reporting limit in only two samples from the entire site suggests that the presence of thallium, both across the site and at individual wells, is sporadic and inconsistent. Further, as thallium was only detected in one sample from each of the two wells where it was detected, the EPCs used in the well-specific risk assessment are maximum detected concentrations (because there are too few data points to calculate 95% UCLs OTM). This is overly conservative for a compound that has been detected in only 0.53 percent of all groundwater samples, as the bulk of the evidence indicates that thallium is not actually present in site groundwater above the laboratory reporting limit.

It is worth noting that the two detections of thallium are geographically distinct from one another; MW-12 is located within the hexavalent chromium plume, and CW-3D is located outside the plume on the far west side of the site, in the IM injection area, approximately 2,800 feet to the northwest.

5.8 Fluoride

As shown in Table P-1, fluoride is a material contributor to elevated noncancer hazard at 5 wells: MW-1 (total HI of 9.9; fluoride-specific HI of 8.5), MW-6 (total HI of 9.2, fluoride-specific HI of 9.2), MW-10 (total HI of 75, fluoride-specific HI of 26), MW-33-40 (total HI of 9.5, fluoride-specific HI of 9.4), and CW-2D (total HI of 6.7, fluoride-specific HI of 4.7). MW-10 is the only well in this list within the hexavalent chromium groundwater plume. It is notable that background concentrations for fluoride exceed the noncancer hazard threshold of 1.0. Specifically, the background upper tolerance limit

(UTL) for fluoride of 7.12 mg/L corresponds to a noncancer hazard of 7.6, exceeding the threshold of 1.0. The background mean concentration of fluoride is 1.4 mg/L, which corresponds to an HI of 1.5. In sum, for a compound like fluoride, where the background concentrations exceed a risk-based threshold, it is most common to focus on understanding and identifying those wells where the representative exposure concentration could be greater than background. Based on a comparison of the well-specific EPCs to the background UTL of 7.12 mg/L, wells MW-1, MW-6, MW-10, and MW-33-40 all have representative EPCs that exceed the background UTL (with EPCs of 8 mg/L, 8.6 mg/L, 25 mg/L, and 8.8 mg/L, respectively). Similarly, based on a comparison of the average concentration of fluoride at each well to the average background fluoride concentration of 1.4 mg/L, wells MW-1, MW-6, MW-10, MW-30-44, and CW-2D all exceed the average background fluoride concentration (with average wells concentrations of 2.1 mg/L, 7.9 mg/L, 16.2 mg/L, 8.5 mg/L and 2.9 mg/L, respectively).

5.9 Lead

As shown in Table P-2, lead is present in concentrations above the CAL for lead at seven wells: MW-20-100 (EPC to CAL ratio of 1.1), MW-20-130 (EPC to CAL ratio of 2.8), MW-22 (EPC to CAL ratio of 5.1), MW-23 (EPC to CAL ratio of 1.8), MW-27-20 (EPC to CAL ratio of 1.6), MW-30-30 (EPC to CAL ratio of 4.9), and MW-31-60 (EPC to CAL ratio of 1.4). Of these wells, MW-20-100, MW-20-130, and MW-31-60 are within the hexavalent chromium groundwater plume. As presented in Appendix G, use of average rather than maximum concentrations results in exceedances of the CAL at only two wells, MW-22 (EPC to CAL ratio of 1.1) and MW-30-30 (EPC to CAL ratio of 2.5) both located outside the hexavalent chromium groundwater plume.

5.10 Molybdenum

As shown in Table P-1, molybdenum is a material contributor to elevated noncancer hazard at 17 wells, including 12 wells inside the hexavalent chromium plume: MW-10 (total HI of 75; molybdenum-specific HI of 2.1), MW-20-130 (total HI of 190; molybdenum-specific HI of 0.62), MW-24B (total HI of 110; molybdenum-specific HI of 0.84), MW-26 (total HI of 82; molybdenum-specific HI of 0.55), MW-38S (total HI of 20; molybdenum-specific HI of 0.82), MW-38D (total HI of 6.3; molybdenum-specific HI of 1.0), MW-44-115 (total HI of 30; molybdenum-specific HI of 1.1), MW-44-125 (total HI of 10; molybdenum-specific HI of 1.6), MW-46-175 (total HI of 6.3; molybdenum-specific HI of 2.5), and PGE-7 (total HI of 120; molybdenum-specific HI of 0.72); and seven wells outside the hexavalent chromium plume: MW-1 (total HI of 9.9; molybdenum-

specific HI of 1.0), MW-5 (total HI of 2.3; molybdenum-specific HI of 1.2), MW-21 (total HI of 1.4; molybdenum-specific HI of 0.67), MW-22 (total HI of 4.6; molybdenum-specific HI of 0.72), MW-30-30 (total HI of 5.0; molybdenum-specific HI of 1.3), OW-5M (total HI of 7.1; molybdenum-specific HI of 0.41), and PGE-8 (total HI of 1.1; molybdenum-specific HI of 1.0). Those wells where the molybdenum-specific HI exceeds 1.0 or where molybdenum contributes materially to cumulative hazard are distributed across the site.

In the sensitivity analysis presented in Appendix G, molybdenum is a material contributor at 14 wells. In the sensitivity analysis, the set of wells where molybdenum is a material contributor changes; molybdenum is a material contributor at MW-12, CW-2D, and CW-3D and is not a material contributor at MW-1, MW-21, MW-26, MW-30-30, MW-44-115, or PGE-8. The average molybdenum-specific HI at these 17 wells decreases slightly in the sensitivity analysis, from 1.1 to 1.0.

5.11 Nitrate as Nitrogen

As shown in Table P-1, nitrate as nitrogen is a material contributor to elevated noncancer hazard at eight wells, including five wells inside the hexavalent chromium plume: MW-9 (total HI of 8.7; nitrate-specific HI of 0.91), MW-10 (total HI of 75; nitrate-specific HI of 0.65), MW-24A (total HI of 82; nitrate-specific HI of 0.74), MW-51 (total HI of 100; nitrate-specific HI of 0.57), and PT-8M (total HI of 87; nitrate-specific HI of 1.3); and two wells outside the hexavalent chromium plume: MW-5 (total HI of 2.3; nitrate-specific HI of 0.76) and Park Moabi-4 (total HI of 1.2; nitrate-specific HI of 1.0).

In the sensitivity analysis presented in Appendix G, nitrate as nitrogen is a material contributor to elevated noncancer hazard at only three wells. Two of these wells (MW-51 and PT-8M) have only one sample for nitrate as nitrogen and consequently the mean and maximum concentrations are identical.

5.12 Vanadium

As shown in Table P-1, vanadium is a material contributor to elevated noncancer hazard at 17 wells, including five wells inside the hexavalent chromium plume: MW-10 (total HI of 75; vanadium-specific HI of 0.54), MW-12 (total HI of 58; vanadium-specific HI of 0.75), MW-20-70 (total HI of 210; vanadium-specific HI of 0.53), MW-20-130 (total HI of 190; vanadium-specific HI of 0.93), and MW-31-60 (total HI of 85; vanadium-specific HI of 1.1); and 12 wells outside the hexavalent chromium plume: MW-22 (total HI of 4.6; vanadium-specific HI of 1.6), MW-30-30 (total HI of 5.0; vanadium-specific HI

of 1.8), MW-34-55 (total HI of 7.6; vanadium-specific HI of 2.7), OW-1D (total HI 1.2; vanadium-specific HI of 0.69), OW-5M (total HI of 7.1; vanadium-specific HI of 0.56), OW-5D (total HI of 1.4; vanadium-specific HI of 0.66), CW-1D (total HI of 1.4; vanadium-specific HI of 0.82), CW-2M (total HI of 1.2; vanadium-specific HI of 1.1), CW-2D (total HI of 6.7; vanadium-specific HI of 1.1), CW-3M (total HI of 1.5; vanadium-specific HI of 0.90), CW-3D (total HI of 3.2; vanadium-specific HI of 1.1), and CW-4D (total HI of 1.6; vanadium-specific HI of 1.0). These 17 wells are distributed across the site, including within the IM No. 3 injection well field area, the floodplain area, and within the general footprint of the hexavalent chromium plume.

In the sensitivity analysis presented in Appendix G, when vanadium EPCs are based on mean concentrations instead of maximum concentrations, the average vanadium-specific HI at these 17 wells is 0.58. However, as presented in Table P-1, in the sensitivity analysis vanadium is a material contributor to elevated noncancer hazard in only nine of these wells, with an average vanadium-specific HI of 0.87.

5.13 Antimony

As shown in Table P-1, antimony is a material contributor to elevated noncancer hazard at seven wells, including five wells inside the hexavalent chromium plume: MW-12 (total HI of 58; antimony-specific HI of 3.4), MW-20-70 (total HI of 210; antimony-specific HI of 1.4), MW-20-100 (total HI of 170; antimony-specific HI of 6.9), TW-2S (total HI of 130; antimony-specific HI of 25), and TW-2D (total HI of 140; antimony-specific HI of 25); and two wells outside the hexavalent chromium plume: MW-34-55 (total HI of 7.6; antimony-specific HI of 4.2) and OW-5M (total HI of 7.1; antimony-specific HI of 1.8).

At each of these locations, antimony was detected in only one or two groundwater samples, suggesting that the presence of antimony, both across the site and at individual wells, is sporadic and inconsistent. Because antimony was only detected in one or two samples at each of these wells, the EPCs used in the well-specific risk assessment are maximum detected concentrations (because there are too few data points to calculate 95% UCLs OTM). This is very conservative for a compound that has been detected in only 2.3 percent of all groundwater samples, as the bulk of the evidence indicates that antimony is not actually present in site groundwater above the laboratory reporting limit. This is further supported by the sensitivity analysis presented in Appendix G, in which estimated antimony-specific HIs are based on average, rather than maximum, concentrations. When antimony EPCs are based on average concentrations at each well, the antimony-specific HI exceeds the threshold value of 1.0 at only three wells: MW-20-100, TW-2S, and TW-2D.

5.14 Arsenic

As shown in Table P-1, arsenic is a material contributor to elevated noncancer hazard at three wells: MW-24A (total HI of 82; arsenic-specific HI of 7.2), MW-12 (total HI of 58; arsenic-specific HI of 23), and MW-43-25 (total HI of 5.3; arsenic-specific HI of 5.2). MW-12 and MW-24A are located within the hexavalent chromium plume. Arsenic was detected in 17 of 17 samples from MW-12; therefore, the EPC used in the well-specific risk assessment at this location is the calculated 95% UCL OTM. At wells MW-24A and MW-43-25, arsenic was detected in three of four samples and in three of three samples, respectively; therefore, the EPCs used in the well-specific risk assessment at these locations are maximum detected concentrations. Average arsenic concentrations at MW-24A and MW-43-35 are still above the average background concentration. However, it is notable that the maximum detected concentrations at MW-24A (0.034 mg/L) and MW-43-25 (0.0244 mg/L) are only marginally greater than the background UTL of 0.0243 mg/L. Further, the three wells where arsenic was detected above background levels are not geographically near one another; therefore, the elevated concentrations at MW-12 and the marginally elevated concentrations at MW-43-25 and MW-24A do not appear to collectively represent a reasonable future exposure area.

As was described in the RFI/RI Volume 2 (CH2M HILL, 2009), there is little evidence that correlates the elevated arsenic concentrations with SWMU 1/AOC 1 or SWMU 2. The arsenic concentration measured at MW-24A increased from 0.0054 mg/L in July 2007 to 0.034 mg/L in May 2008, above the UTL of 0.0243 mg/L. This increase in arsenic concentration is an anticipated effect of the in-situ pilot study being conducted on the MW-24 bench. Arsenic concentrations showed increases to similar levels in the nearby in-situ pilot wells (ARCADIS, 2008).

As was stated in the RFI/RI Volume 2 (CH2M HILL, 2009), whatever the source of arsenic, elevated concentrations in groundwater are not widespread (arsenic was detected above background levels in only 2.7 percent of wells), and do not appear to be associated with SWMU 1/AOC 1 or SWMU 2. In fact, the 95% UCL OTM concentration of arsenic calculated for those wells located within the hexavalent chromium plume is 0.023 mg/L, which is approximately equal to the background UTL.

In sum, the concentrations of arsenic measured at MW-12 are clearly elevated above the background UTL, and the estimated arsenic-specific HI at this well of 23 is well above the threshold of 1.0. Concentrations of arsenic measured in MW-24A and MW-43-25 are only slightly greater than the background UTL, however, and arsenic

concentrations at MW-24A appear to have increased to a level slightly above background as a result of the in-situ pilot study.

5.15 Hexavalent Chromium

As shown in Table P-1, hexavalent chromium is a material contributor to elevated noncancer hazard at 65 groundwater wells, 56 of which are inside the hexavalent chromium groundwater plume. The wells with the largest hexavalent chromium-specific HIs are PT-9D (total HI of 340; hexavalent chromium-specific HI of 340), MW-50-200 (total HI of 240; hexavalent chromium-specific HI of 240), MW-20-70 (total HI of 210; hexavalent chromium-specific HI of 210), MW-20-130 (total HI of 190; hexavalent chromium-specific HI of 180), MW-39-100 (total HI of 170; hexavalent chromium-specific HI of 170), MW-20-100 (total HI of 160; hexavalent chromium-specific HI of 160), PT-7D (total HI of 160; hexavalent chromium-specific HI of 160), PT-8D (total HI of 140; hexavalent chromium-specific HI of 140), PT-5D (total HI of 130; hexavalent chromium-specific HI of 130), and PT-4D (total HI of 130; hexavalent chromium-specific HI of 130). All of these wells are located inside the identified hexavalent chromium groundwater plume.

The set of wells at which hexavalent chromium contributes materially to elevated noncancer hazard changes only slightly in the sensitivity analysis presented in Appendix G. MW-24BR, with only one hexavalent chromium detection, is no longer a material contributor to elevated noncancer hazard when the EPC is based on the mean rather than maximum concentration.

6. References

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ARCADIS

Tables

Table P-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI
Barium									
MW-23	Out	8	3	0	Max/mean	2.2E+00	1.7E+00	NA	NA
MW-32-20	Out	1	1	NA	Max/mean	1.7E+00	1.7E+00	1.7E+00	1.7E+00
Average							1.7E+00		1.7E+00
Cadmium									
OW-5M	Out	14	1	0	Max/mean	7.1E+00	1.4E+00	NA	NA
Average							1.4E+00		NA
Cobalt									
MW-22	Out	3	1	2	Max/mean	4.6E+00	1.1E+00	2.4E+00	7.1E-01
OW-5M	Out	14	1	7	Max/mean	7.1E+00	2.1E+00	2.3E+00	5.2E-01
Average							1.6E+00		6.2E-01
Nickel									
MW-22	Out	27	17	0	95%UCLOTM	4.6E+00	4.8E-01	2.4E+00	4.8E-01
MW-30-30	Out	22	15	1	95%UCLOTM	5.0E+00	8.4E-01	2.3E+00	8.4E-01
Average							6.6E-01		6.6E-01
Nitrate as nitrogen									
MW-9	In	7	7	NA	Max/mean	8.7E+00	9.1E-01	NA	NA
MW-10	In	7	7	NA	Max/mean	7.5E+01	6.5E-01	NA	NA
MW-24A	In	7	7	NA	Max/mean	8.2E+01	7.4E-01	7.7E+01	4.5E-01
MW-51	In	1	1	NA	Max/mean	1.0E+02	5.7E-01	9.9E+01	5.7E-01
PT-8M	In	1	1	NA	Max/mean	8.7E+01	1.3E+00	8.7E+01	1.3E+00
MW-40D	Out	3	3	NA	Max/mean	3.2E+00	7.9E-01	NA	NA
MW-5	Out	2	2	NA	Max/mean	2.3E+00	7.6E-01	NA	NA
Park Moabi-4	Out	2	2	NA	Max/mean	1.2E+00	1.0E+00	NA	NA
Average							8.4E-01		7.7E-01
Selenium									
MW-24A	In	3	2	0	Max/mean	8.2E+01	6.5E-01	NA	NA
TW-1	In	4	4	NA	Max/mean	1.0E+02	2.0E+00	9.1E+01	1.4E+00
Average							1.3E+00		1.4E+00

Table P-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI
Silver									
MW-10	In	14	1	0	Max/mean	7.5E+01	7.9E-01	NA	NA
TW-1	In	4	2	0	Max/mean	1.0E+02	1.1E+00	NA	NA
OW-5S	Out	14	1	0	Max/mean	1.9E+00	8.3E-01	NA	NA
Average							9.2E-01		NA
Thallium									
MW-12	In	17	1	6	Max/mean	5.8E+01	1.1E+00	5.6E+01	2.5E+00
CW-3D	Out	7	1	3	Max/mean	3.2E+00	1.2E+00	3.8E+00	2.7E+00
Average							1.1E+00		2.6E+00
Fluoride									
MW-10	In	6	6	NA	Max/mean	7.5E+01	2.6E+01	6.5E+01	1.7E+01
MW-1	Out	7	7	NA	Max/mean	9.9E+00	8.5E+00	2.7E+00	2.3E+00
MW-6	Out	6	6	NA	Max/mean	9.2E+00	9.2E+00	8.5E+00	8.5E+00
MW-33-40	Out	3	3	NA	Max/mean	9.5E+00	9.4E+00	9.2E+00	9.1E+00
CW-2D	Out	8	7	1	95%UCLOTM	6.7E+00	4.7E+00	5.8E+00	4.7E+00
Average							1.2E+01		8.4E+00
Molybdenum									
MW-10	In	17	17	NA	95%UCLOTM	7.5E+01	2.1E+00	6.5E+01	2.1E+00
MW-12	In	20	20	NA	95%UCLOTM	NA	NA	5.6E+01	7.0E-01
MW-20-130	In	15	15	NA	95%UCLOTM	1.9E+02	6.2E-01	1.9E+02	6.2E-01
MW-24B	In	3	3	NA	Max/mean	1.1E+02	8.4E-01	1.1E+02	7.8E-01
MW-26	In	6	6	NA	Max/mean	8.2E+01	5.5E-01	NA	NA
MW-38S	In	1	1	NA	Max/mean	2.0E+01	8.2E-01	2.0E+01	8.2E-01
MW-38D	In	1	1	NA	Max/mean	6.3E+00	1.0E+00	5.9E+00	1.0E+00
MW-44-115	In	3	3	NA	Max/mean	3.0E+01	1.1E+00	NA	NA
MW-44-125	In	1	1	NA	Max/mean	1.0E+01	1.6E+00	9.9E+00	1.6E+00
MW-46-175	In	1	1	NA	Max/mean	6.3E+00	2.5E+00	6.3E+00	2.5E+00
PGE-7	In	2	2	NA	Max/mean	1.2E+02	7.2E-01	1.2E+02	7.1E-01
MW-1	Out	12	3	0	Max/mean	9.9E+00	1.0E+00	NA	NA

Table P-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI
MW-5	Out	12	11	0	95%UCLOTM	2.3E+00	1.2E+00	2.1E+00	1.2E+00
MW-21	Out	6	5	0	Max/mean	1.4E+00	6.7E-01	NA	NA
MW-22	Out	6	5	0	Max/mean	4.6E+00	7.2E-01	2.4E+00	4.4E-01
MW-30-30	Out	4	2	0	Max/mean	5.0E+00	1.3E+00	NA	NA
OW-5M	Out	16	16	NA	95%UCLOTM	7.1E+00	4.1E-01	2.3E+00	4.1E-01
PGE-8	Out	3	3	NA	Max/mean	1.1E+00	1.0E+00	NA	NA
CW-2D	Out	8	8	NA	95%UCLOTM	NA	NA	5.8E+00	7.9E-01
CW-3D	Out	8	8	NA	95%UCLOTM	NA	NA	3.8E+00	8.4E-01
Average							1.1E+00		1.0E+00
Vanadium									
MW-10	In	17	17	NA	95%UCLOTM	7.5E+01	5.4E-01	6.5E+01	5.4E-01
MW-12	In	20	20	NA	95%UCLOTM	5.8E+01	7.5E-01	5.6E+01	7.5E-01
MW-20-70	In	16	15	0	95%UCLOTM	2.1E+02	5.3E-01	2.1E+02	5.3E-01
MW-20-130	In	15	11	0	95%UCLOTM	1.9E+02	9.3E-01	1.9E+02	9.3E-01
MW-31-60	In	5	4	0	Max/mean	8.5E+01	1.1E+00	NA	NA
MW-22	Out	6	2	0	Max/mean	4.6E+00	1.6E+00	NA	NA
MW-30-30	Out	4	1	0	Max/mean	5.0E+00	1.8E+00	2.3E+00	5.0E-01
MW-34-55	Out	9	5	0	95%UCLOTM	7.6E+00	2.7E+00	3.5E+00	2.7E+00
OW-1D	Out	15	14	0	95%UCLOTM	1.2E+00	6.9E-01	1.2E+00	6.9E-01
OW-5M	Out	14	12	0	95%UCLOTM	7.1E+00	5.6E-01	2.3E+00	5.6E-01
OW-5D	Out	14	11	0	95%UCLOTM	1.4E+00	6.6E-01	1.3E+00	6.6E-01
CW-1D	Out	7	6	0	Max/mean	1.4E+00	8.2E-01	NA	NA
CW-2M	Out	7	6	0	Max/mean	1.2E+00	1.1E+00	NA	NA
CW-2D	Out	7	6	0	Max/mean	6.7E+00	1.1E+00	NA	NA
CW-3M	Out	7	6	0	Max/mean	1.5E+00	9.0E-01	NA	NA
CW-3D	Out	7	6	0	Max/mean	3.2E+00	1.1E+00	NA	NA
CW-4D	Out	7	6	0	Max/mean	1.6E+00	1.0E+00	NA	NA
Average							1.1E+00		8.7E-01

Table P-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI
Antimony									
MW-12	In	17	2	0	Max/mean	5.8E+01	3.4E+00	NA	NA
MW-20-70	In	13	1	0	Max/mean	2.1E+02	1.4E+00	NA	NA
MW-20-100	In	1	1	NA	Max/mean	1.7E+02	6.9E+00	1.7E+02	6.9E+00
TW-2S	In	3	1	0	Max/mean	1.3E+02	2.5E+01	1.1E+02	8.4E+00
TW-2D	In	3	1	0	Max/mean	1.4E+02	2.5E+01	1.3E+02	8.5E+00
MW-34-55	Out	9	1	0	Max/mean	7.6E+00	4.2E+00	NA	NA
OW-5M	Out	14	1	0	Max/mean	7.1E+00	1.8E+00	NA	NA
Average							9.6E+00		7.9E+00
Arsenic									
MW-12	In	17	17	NA	95%UCLOTM	5.8E+01	2.3E+01	5.6E+01	2.3E+01
MW-24A	In	4	3	1	Max/mean	8.2E+01	7.2E+00	7.7E+01	2.8E+00
MW-43-25	Out	3	3	NA	Max/mean	5.3E+00	5.2E+00	4.8E+00	4.7E+00
Average							1.2E+01		1.0E+01
Chromium, hexavalent									
MW-9	In	35	35	NA	95%UCLOTM	8.7E+00	7.5E+00	8.1E+00	7.5E+00
MW-10	In	37	37	NA	95%UCLOTM	7.5E+01	4.4E+01	6.5E+01	4.4E+01
MW-11	In	34	34	NA	95%UCLOTM	1.9E+01	1.9E+01	1.9E+01	1.9E+01
MW-12	In	40	40	NA	95%UCLOTM	5.8E+01	2.9E+01	5.6E+01	2.9E+01
MW-19	In	34	34	NA	95%UCLOTM	2.0E+01	1.9E+01	2.0E+01	1.9E+01
MW-20-70	In	39	39	NA	95%UCLOTM	2.1E+02	2.1E+02	2.1E+02	2.1E+02
MW-20-100	In	37	37	NA	95%UCLOTM	1.7E+02	1.6E+02	1.7E+02	1.6E+02
MW-20-130	In	38	38	NA	95%UCLOTM	1.9E+02	1.8E+02	1.9E+02	1.8E+02
MW-24A	In	32	32	NA	95%UCLOTM	8.2E+01	7.3E+01	7.7E+01	7.3E+01
MW-24B	In	34	34	NA	95%UCLOTM	1.1E+02	1.1E+02	1.1E+02	1.1E+02
MW-24BR	In	34	1	0	Max/mean	8.4E+00	7.5E+00	NA	NA
MW-25	In	33	33	NA	95%UCLOTM	5.1E+01	5.1E+01	5.1E+01	5.1E+01
MW-26	In	35	34	0	95%UCLOTM	8.2E+01	8.1E+01	8.1E+01	8.1E+01
MW-31-60	In	36	36	NA	95%UCLOTM	8.5E+01	8.4E+01	8.4E+01	8.4E+01

Table P-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI
MW-31-135	In	14	14	NA	95%UCLOTM	6.1E+00	6.1E+00	6.1E+00	6.1E+00
MW-34-100	In	79	79	NA	95%UCLOTM	1.6E+01	1.5E+01	1.6E+01	1.5E+01
MW-36-90	In	39	38	0	95%UCLOTM	5.5E+01	5.5E+01	5.5E+01	5.5E+01
MW-36-100	In	51	51	NA	95%UCLOTM	3.3E+01	3.3E+01	3.3E+01	3.3E+01
MW-37D	In	15	15	NA	95%UCLOTM	3.5E+01	3.4E+01	3.5E+01	3.4E+01
MW-38S	In	11	11	NA	95%UCLOTM	2.0E+01	1.9E+01	2.0E+01	1.9E+01
MW-38D	In	11	11	NA	95%UCLOTM	6.3E+00	4.7E+00	5.9E+00	4.7E+00
MW-39-80	In	40	40	NA	95%UCLOTM	9.5E+01	9.5E+01	9.5E+01	9.5E+01
MW-39-100	In	41	41	NA	95%UCLOTM	1.7E+02	1.7E+02	1.7E+02	1.7E+02
MW-44-115	In	32	32	NA	95%UCLOTM	3.0E+01	2.9E+01	3.0E+01	2.9E+01
MW-44-125	In	29	29	NA	95%UCLOTM	1.0E+01	8.2E+00	9.9E+00	8.2E+00
MW-45-095a	In	3	3	NA	Max/mean	5.6E+00	5.6E+00	4.5E+00	4.5E+00
MW-46-175	In	29	29	NA	95%UCLOTM	6.3E+00	3.8E+00	6.3E+00	3.8E+00
MW-47-55	In	8	8	NA	95%UCLOTM	1.2E+00	1.2E+00	1.2E+00	1.2E+00
MW-50-095	In	8	8	NA	95%UCLOTM	5.9E+00	5.9E+00	5.9E+00	5.9E+00
MW-50-200	In	8	8	NA	95%UCLOTM	2.4E+02	2.4E+02	2.4E+02	2.4E+02
MW-51	In	7	7	NA	Max/mean	1.0E+02	1.0E+02	9.9E+01	9.7E+01
PE-1	In	24	21	0	95%UCLOTM	2.2E+00	2.2E+00	2.2E+00	2.2E+00
PT-7S	In	1	1	NA	Max/mean	2.7E+01	2.6E+01	2.7E+01	2.6E+01
PT-7M	In	1	1	NA	Max/mean	5.1E+01	5.0E+01	5.1E+01	5.0E+01
PT-7D	In	1	1	NA	Max/mean	1.6E+02	1.6E+02	1.6E+02	1.6E+02
PT-8S	In	1	1	NA	Max/mean	3.9E+01	3.8E+01	3.9E+01	3.8E+01
PT-8M	In	1	1	NA	Max/mean	8.7E+01	8.5E+01	8.7E+01	8.5E+01
PT-8D	In	1	1	NA	Max/mean	1.4E+02	1.4E+02	1.4E+02	1.4E+02
PT-9S	In	1	1	NA	Max/mean	2.6E+01	2.5E+01	2.6E+01	2.5E+01
PT-9M	In	1	1	NA	Max/mean	5.2E+01	5.1E+01	5.2E+01	5.1E+01
PT-9D	In	1	1	NA	Max/mean	3.4E+02	3.4E+02	3.4E+02	3.4E+02
TW-1	In	3	3	NA	Max/mean	1.0E+02	1.0E+02	9.1E+01	8.9E+01
TW-2S	In	10	10	NA	95%UCLOTM	1.3E+02	1.1E+02	1.1E+02	1.1E+02

Table P-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI
TW-2D	In	12	12	NA	95%UCLOTM	1.4E+02	1.2E+02	1.3E+02	1.2E+02
TW-3D	In	22	22	NA	95%UCLOTM	6.1E+01	6.1E+01	6.1E+01	6.1E+01
PGE-6	In	18	13	0	95%UCLOTM	2.6E+01	2.6E+01	2.6E+01	2.6E+01
PGE-7	In	16	15	0	95%UCLOTM	1.2E+02	1.2E+02	1.2E+02	1.2E+02
PT-1D	In	2	2	NA	Max/mean	6.6E+01	6.6E+01	6.0E+01	6.0E+01
PT-2D	In	2	2	NA	Max/mean	5.0E+01	5.0E+01	4.3E+01	4.3E+01
PT-3D	In	2	2	NA	Max/mean	9.6E+01	9.6E+01	9.5E+01	9.5E+01
PT-4D	In	1	1	NA	Max/mean	1.3E+02	1.3E+02	1.3E+02	1.3E+02
PT-5D	In	2	1	0	Max/mean	1.3E+02	1.3E+02	6.6E+01	6.6E+01
PT-6D	In	2	2	NA	Max/mean	7.1E+01	7.1E+01	6.0E+01	6.0E+01
PTI-1D	In	1	1	NA	Max/mean	7.2E+01	7.2E+01	7.2E+01	7.2E+01
PTR-1	In	1	1	NA	Max/mean	1.2E+01	1.2E+01	1.2E+01	1.2E+01
PTR-2	In	1	1	NA	Max/mean	7.0E+01	6.9E+01	7.0E+01	6.9E+01
MW-8	Out	6	6	NA	Max/mean	2.0E+00	1.1E+00	1.7E+00	9.2E-01
MW-14	Out	37	36	0	95%UCLOTM	1.5E+00	9.4E-01	1.5E+00	9.4E-01
MW-30-50	Out	45	34	0	95%UCLOTM	2.9E+01	2.9E+01	2.9E+01	2.9E+01
MW-39-50	Out	18	12	0	95%UCLOTM	3.7E+01	3.6E+01	3.6E+01	3.6E+01
MW-39-60	Out	18	16	0	95%UCLOTM	6.3E+01	6.3E+01	6.3E+01	6.3E+01
MW-39-70	Out	27	27	NA	95%UCLOTM	9.3E+01	9.3E+01	9.3E+01	9.3E+01
MW-40D	Out	15	15	NA	95%UCLOTM	3.2E+00	1.8E+00	2.7E+00	1.8E+00
OW-2S	Out	16	15	0	95%UCLOTM	1.7E+00	8.6E-01	1.7E+00	8.6E-01
OW-5S	Out	16	16	NA	95%UCLOTM	1.9E+00	5.8E-01	1.2E+00	5.8E-01
Average							6.6E+01		6.5E+01

Table P-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI

Notes:

(1) In the primary analysis of the GWRA, estimated EPCs are based on maximum detected concentrations when 95% (UCLs) OTM cannot be reliably calculated with ProUCL 4.0 because there are less than eight samples or less than five detections In the dataset. The sensitivity analysis bases EPCs on mean concentrations when 95%UCLs of the mean cannot be reliably calculated with ProUCL 4.0.

(2) Wells shown are those determined to be material contributors to elevated noncancer hazard based on the methodologies In Appendix P.

(3) NA = Not applicable. Either:

(a) This well was not determined to be a material contributor to elevated noncancer hazard In this analysis.

(b) There are no non-detect results at this well.

EPC = exposure point concentration
HI = hazard Index
ND = not detected
OTM = of the mean
RBC = risk-based concentration
UCL = upper confidence limit
GWRA = groundwater risk assessment

Table P-2. Well-by-Well Lead Summary

Location	In/Out of Plume	No. Samples	No. Detections	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
					Lead EPC (mg/L)	Ratio of EPC to CAL	Lead EPC (mg/L)	Ratio of EPC to CAL
MW-20-100	In	4	2	Max/mean	1.7E-02	1.1	5.7E-03	NA
MW-20-130	In	15	1	Max/mean	4.2E-02	2.8	3.8E-03	NA
MW-31-60	In	5	1	Max/mean	2.1E-02	1.4	5.5E-03	NA
MW-22	Out	5	1	Max/mean	7.6E-02	5.1	1.6E-02	1.1
MW-23	Out	6	2	Max/mean	2.7E-02	1.8	6.4E-03	NA
MW-27-20	Out	3	3	Max/mean	2.4E-02	1.6	9.7E-03	NA
MW-30-30	Out	4	2	Max/mean	7.3E-02	4.9	3.8E-02	2.5
Average						2.7		1.8

Notes:

(1) In the primary analysis of the GWRA, estimated EPCs are based on maximum detected concentrations when 95% UCLs OTM cannot be reliably calculated with ProUCL 4.0 because there are less than eight samples or less than five detections In the dataset. The sensitivity analysis bases EPCs on mean concentrations when 95% UCLs of the mean cannot be reliably calculated with ProUCL 4.0.

(2) CAL for lead provided In CCR Title 22, Division 4, Chapter 17.5, Article 3, Section 64678.

CAL = California Action Level
CCR = California Code of Regulations
EPC = exposure point concentration
mg/L = milligram(s) per liter
NA = not applicable, this well was not determined to have a lead EPC above the CAL In this analysis
OTM = of the mean
UCL = upper confidence limit
GWRA = groundwater risk assessment

ARCADIS

Appendix Q

Risk-Based Concentrations of Constituents of Potential Concern in Groundwater

ARCADIS
Infrastructure, environment, buildings

Imagine the result

Pacific Gas and Electric Company

Appendix Q – Risk-Based Concentrations of Constituents of Potential Concern in Groundwater

HERA of Groundwater Impacted by Activities at
SWMU 1/AOC 1 and SWMU 2
Topock Compressor Station, Needles, California

November 2009

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Acronyms and Abbreviations

COPC	constituent of potential concern
HI	hazard index
MCLs	maximum contaminant levels
NCP	National Contingency Plan
RAWP	Risk Assessment Work Plan
RBC	risk-based concentration
USEPA	U.S. Environmental Protection Agency

Appendix Q

Risk-Based Concentrations of Constituents of Potential Concern

1. Introduction

Risk-based concentrations (RBCs) are calculated for constituents of potential concern (COPCs) in the groundwater human health and ecological risk assessment and presented in this appendix. As described in the Risk Assessment Work Plan (RAWP; ARCADIS, 2008), an RBC for groundwater is the concentration of a chemical in groundwater that corresponds to a threshold level of cancer risk or noncancer hazard under a set of assumed exposure assumptions. RBCs are considered health protective and are used as human health screening criteria for discussion purposes at various junctures in the risk assessment.

When applicable or relevant and appropriate requirements are not available, RBCs for groundwater are calculated using the same information regarding chemical-specific toxicities, physicochemical properties, and receptor-specific exposure conditions that were used in the baseline estimate of risks/hazard. Carcinogenic RBCs are calculated based on a target cancer risk, and likewise noncarcinogenic RBCs are calculated based on a target noncancer hazard index (HI). The target cancer risk level is the "acceptable" cancer risk level as defined and endorsed by relevant state and federal agencies. The National Contingency Plan (NCP) is cited by the U.S. Environmental Protection Agency (USEPA, 1990) as the basis for defining acceptable incremental cancer risk levels. According to the NCP, lifetime incremental cancer risk levels posed by a site should be within the risk range of one in a million (1×10^{-6}) to 100 in a million (1×10^{-4}). Thus, USEPA and the California Environmental Protection Agency typically consider the 1×10^{-6} risk level to be an insignificant risk, and consider a calculated excess cancer risk between 1×10^{-6} and 1×10^{-4} to be within the acceptable risk range. For noncancer health hazards, an HI of unity (1.0) is identified as the target level of concern. Chemical exposures that yield HIs of less than 1.0 are not expected to result in adverse noncancer health effects (USEPA, 1989). Therefore, as specified in the RAWP (ARCADIS, 2008), for purposes of developing RBCs, the target cancer risk level is 1×10^{-6}, and the target noncancer hazard quotient is 1.0.

The most conservative receptors are used for carcinogenic (a future hypothetical age-adjusted groundwater user) and noncarcinogenic (a future hypothetical child groundwater user) RBCs to obtain a health protective RBC applicable to all populations. As presented in Equation 1 of Section 7.1.1 and Equation 3 of Section 7.1.2 of the main text, risks and hazards are calculated as the product of a toxicity parameter and the chronic daily intake, which is defined in Table 5-3. Consistent with standard risk assessment protocols, the RBC is calculated by re-arranging these equations and

solving for the concentration in water (C_w) term; in this manner, C_w is the equivalent of the RBC, as indicated in the equations presented in Table Q-1.

2. Results

Carcinogenic and noncarcinogenic RBCs are calculated for COPCs in groundwater and are presented in Table Q-2. These concentrations represent health-protective screening levels that are used at various junctures in the groundwater risk assessment report for discussion purposes. For comparison purposes, maximum contaminant levels (MCLs) are also shown for chemicals, when available.

3. References

ARCADIS. 2008. *Human Health and Ecological Risk Assessment Work Plan, Topock Compressor Station, Needles, California*. August.

USEPA. 1989. *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)*. EPA/540/1-89-002. U.S. Environmental Protection Agency. December.

USEPA. 1990. National Oil and Hazardous Substances Pollution Contingency Plan. Federal Register 55(46):8666-8865. U.S. Environmental Protection Agency.

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Tables

Table Q-1. RBC Equations

Carcinogenic RBC (mg/L)

$$RBC_c = \frac{TR \times AT_c}{SF_o \times EF}\left[\frac{ED_{child}}{BW_{child}}\left(IR_{child} + SA_{child} \times PC \times ET_{child} \times CF\right) + \frac{ED_{age-adjusted}}{BW_{adult}}\left(IR_{adult} + SA_{adult} \times PC \times ET_{adult} \times CF\right)\right]^{-1}$$

Noncarcinogenic RBC (mg/L)

$$RBC_{nc} = \frac{THQ \times BW_{child} \times AT_{nc} \times RfD_o}{\left(EF \times ED_{child}\right)\left(IR_{child} + SA_{child} \times PC \times ET_{child} \times CF\right)}$$

Notes

(1) Definitions and values of symbols used are given in Table 5-1.

(2) PC is a chemical-specific permeability constant (K_p) given in Table 5-2.

(3) TR = Target risk

(4) THQ = Target hazard quotient

(5) Sf_o and RfD_o are toxicity parameters provided in Table 6-1.

mg/L = milligram(s) per liter

Table Q-2. RBCs in Groundwater

Chemical	RBCs in groundwater (mg/L)		California Primary Maximum Contaminant Level (MCL)	Source
	Noncarcinogenic	Carcinogenic	(mg/L)	
Aluminum	1.6E+01	NC	1.0E+00	1
Antimony	6.2E-03	NC	6.0E-03	1
Arsenic	4.7E-03	7.1E-06	1.0E-02	5
Barium	3.1E+00	NC	1.0E+00	1
Beryllium	3.1E-02	NC	4.0E-03	1
Cadmium	7.8E-03	NC	5.0E-03	1
Chromium, hexavalent	4.6E-02	NC	5.0E-02	1
Cobalt	4.7E-03	NC	NA	
Copper	6.2E-01	NC	1.3E+00	1d
Fluoride	9.3E-01	NC	2.0E+00	1
Mercury	4.7E-03	NC	2.0E-03	1
Molybdenum	7.8E-02	NC	NA	
Nickel	3.1E-01	NC	1.0E-01	1
Nitrate as nitrogen	2.5E+01	NC	1.0E+01	4
Selenium	7.8E-02	NC	5.0E-02	1
Silver	7.8E-02	NC	1.0E-01	2a
Thallium	1.0E-03	NC	2.0E-03	1
Vanadium	1.1E-01	NC	5.0E-02	3c
Zinc	4.7E+00	NC	5.0E+00	2a

Notes:

(1) As described in the text, carcinogenic RBCs are based on the age-adjusted adult receptor and noncarcinogenic RBCs are based on the child receptor.

mg/L = milligram(s) per liter
NC = noncarcinogenic compound

Sources:

(1) California Department of Public Health (CDPH). 2007. Maximum Contaminant Levels and Regulatory Dates for Drinking Water, U.S. EPA vs. California. September. URL: http://www.cdph.ca.gov/certlic/drinkingwater/Documents/DWdocuments/EPAandCDPH.pdf.

(2) California Secondary MCLs, available online at: http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Recentlyadoptedregulations/R-21-03-finalregtext.pdf

Table Q-2. RBCs in Groundwater

(3) California Department of Public Health Drinking Water Notification Levels. http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Notificationlevels/NotificationLevels.pdf

(4) US EPA. http://www.cdph.ca.gov/certlic/drinkingwater/Documents/DWdocuments/EPAandCDPH.pdf.

(5) CDPH, http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Arsenic.aspx

(a) California Secondary MCL provided when Primary MCL is not promulgated.

(b) California Action Level for lead provided in CCR Title 22, Division 4, Chapter 17.5, Article 3, Section 64678

(c) California Department of Public Health Drinking Water Notification Level provided when neither California Primary nor Secondary MCL is promulgated.

(d) Regulatory Action Level; if system exceeds, it must take certain actions such as additional monitoring, corrosion control studies and treatment, and for lead, a public education program; replaces MCL.

(e) As described in the text, RBCs are based on age-adjusted cancer risk for carcinogenic chemicals and based on child noncancer hazard for noncarcinogens.

(g) NA = Not available

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Appendix R

Contributions of SWMU 1/AOC 1 Constituents of Potential Concern to Elevated Cumulative Noncancer Hazard

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Appendix R – Contributions of SWMU1/AOC1 Constituents of Potential Concern to Elevated Cumulative Noncancer Hazard

HERA of Groundwater Impacted by Activities at
SWMU 1/AOC 1 and SWMU 2
Topock Compressor Station, Needles, California

November 2009

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R-1 Well-by-Well Hazard Characterization Summary

Acronyms and Abbreviations

AOC	Area of Concern
COPC	constituent of potential concern
EPC	exposure point concentration
HI	hazard index
OTM	of the mean
SWMU	Solid Waste Management Unit
UCL	upper confidence limit

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Appendix R

Contributions of SWMU 1/AOC 1 Constituents of Potential Concern to Elevated Cumulative Noncancer Hazard

1. Introduction

Based on information in the RFI/RI Volume 2 (CH2M HILL, 2009), only selenium, nitrate as nitrogen, molybdenum, and hexavalent chromium were carried forward as constituents of potential concern (COPCs) associated with groundwater at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1. Cumulative cancer risks and noncancer hazard indices (HIs), discussed in Section 7.3 of the main text, are estimated for all COPCs identified in Section 4 of this groundwater risk assessment. The final list of constituents to be carried forward to the Corrective Measures Study/Feasibility Study, however, will consist of those constituents that could potentially pose an unacceptable risk/hazard to future hypothetical groundwater users and that are considered to be associated with SWMU 1/AOC 1.

The purpose of this appendix is to present an analysis of the contributions of the COPCs to estimated potential cumulative noncancer hazard at individual wells, considering only the COPCs that are potentially associated with SWMU 1/AOC 1: selenium, nitrate as nitrogen, molybdenum, and hexavalent chromium. As part of this evaluation, a sensitivity analysis is conducted to evaluate the impact of using mean concentrations instead of maximum concentrations for constituents with inadequate datasets to calculate a 95% upper confidence limit (UCL) of the mean (OTM).

Based on the methods presented in Appendix P, a constituent with an HI of less than 1.0 can be determined to be a material contributor to cumulative hazard at a particular well when the sum of the constituent-specific HI, and the HIs of all other constituents with lesser HIs, is above 1.0. Accordingly, the determination of the individual wells in which a particular constituent is materially contributing to cumulative noncancer hazard is not independent of contributions by other constituents. Therefore, only selenium, nitrate as nitrogen, molybdenum, and hexavalent chromium will be included in the evaluation of the estimated potential cumulative noncancer hazard at individual wells, as these are the only constituents that are potentially associated with SWMU 1/AOC 1, as defined in the RFI/RI Volume 2 (CH2M HILL, 2009). Essentially, the approach used in Appendix P will be repeated in this appendix considering only selenium, nitrate as nitrogen, molybdenum, and hexavalent chromium.

Then, the results obtained using only these four constituents will be further refined following the methods presented in Appendix G, where the evaluation is repeated using mean concentrations instead of maximum concentrations for constituents with inadequate datasets to calculate a 95% UCL OTM.

2. Primary Analysis

As was done in Appendix P, constituents potentially associated with SWMU 1/AOC 1 are evaluated to determine the material contributors to cumulative hazard at all wells where the sum of the constituent-specific HIs is estimated to be above 1.0. In order to reliably calculate 95% UCLs OTM, a constituent dataset at an individual well must have at least five detections and eight samples. For this primary analysis, maximum concentrations are used as the exposure point concentrations (EPCs) for constituents not meeting these minimum sample size requirements.

The estimated constituent-specific HIs associated with selenium, nitrate as nitrogen, molybdenum, and hexavalent chromium are ranked from lowest to highest at each individual well. A running cumulative (multi-constituent) HI is then calculated for each constituent, starting with the lowest noncancer hazard. The constituent that pushes the cumulative estimated hazard above the threshold value of 1.0, and all constituents with greater HIs, are identified as material contributors to cumulative estimated noncancer hazard at that well. See Appendix P for more detail on the determination of material contributors to cumulative estimated noncancer hazard at individual wells. The results of this analysis are presented in Table R-1 and summarized below:

- Selenium is determined to be a material contributor to cumulative estimated noncancer hazard at 2 of 76 (2.6 percent) wells in which selenium was sampled.

- Nitrate as nitrogen is determined to be a material contributor to cumulative estimated noncancer hazard at 5 of 165 (3.0 percent) wells in which nitrate as nitrogen was sampled.

- Molybdenum is determined to be a material contributor to cumulative estimated noncancer hazard at 13 of 83 (16 percent) wells in which molybdenum was sampled.

- Hexavalent chromium is determined to be a material contributor to cumulative estimated noncancer hazard at 64 of 167 (38 percent) wells in which hexavalent chromium was sampled.

As compared to the primary analysis presented in Appendix P that considers all constituents (i.e., including those thought not to be associated with SWMU 1/AOC 1), selenium is a material contributor at the same number of wells, nitrate as nitrogen at

three fewer wells, molybdenum at seven fewer wells, and hexavalent chromium at one fewer wells.

3. Sensitivity Analysis

In order to calculate 95% UCLs OTM, a constituent dataset at an individual well must have at least five detections and eight samples. In the sensitivity analysis, mean concentrations instead of maximum concentrations are used as EPCs for constituents not meeting these minimum sample size requirements. The determination of material contributors to cumulative noncancer hazard in the sensitivity analysis is identical to the primary analysis. The results of this analysis are presented in Table R-1 and summarized below:

- Selenium is determined to be a material contributor to cumulative estimated noncancer hazard at 1 of 76 (1.3 percent) wells in which selenium was sampled.

- Nitrate as nitrogen is determined to be a material contributor to cumulative estimated noncancer hazard at 2 of 76 (2.6) percent wells in which nitrate as nitrogen was sampled.

- Molybdenum is determined to be a material contributor to cumulative estimated noncancer hazard at 9 of 83 (11 percent) wells in which molybdenum was sampled.

- Hexavalent chromium is determined to be a material contributor to cumulative estimated noncancer hazard at 63 of 167 (38 percent) wells in which hexavalent chromium was sampled.

As compared to the sensitivity analysis in Appendix P that considers all constituents (i.e., including those thought not to be site-related), selenium is a material contributor at the same number of wells, nitrate as nitrogen at one fewer well, molybdenum at five fewer wells, and hexavalent chromium at one fewer well.

4. References

CH2M HILL. 2009. *Revised Final RCRA Facility Investigation/Remedial Investigation Report Volume 2. Hydrogeologic Characterization and Results of Groundwater and Surface Water Investigation, PG&E Topock Compressor Station, Needles, California.* January 12.

Table

Table R-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI
Selenium									
MW-24A	In	3	2	0	Max/mean	7.4E+01	6.5E-01	NA	NA
TW-1	In	4	4	NA	Max/mean	1.0E+02	2.0E+00	9.1E+01	1.4E+00
Average							1.3E+00		1.4E+00
Nitrate as nitrogen									
MW-9	In	7	7	NA	Max/mean	8.6E+00	9.1E-01	NA	NA
MW-24A	In	7	7	NA	Max/mean	7.4E+01	7.4E-01	NA	NA
MW-40D	Out	3	3	NA	Max/mean	3.2E+00	7.9E-01	NA	NA
MW-51	In	1	1	NA	Max/mean	1.0E+02	5.7E-01	9.9E+01	5.7E-01
PT-8M	In	1	1	NA	Max/mean	8.7E+01	1.3E+00	8.7E+01	1.3E+00
Average							8.6E-01		9.2E-01
Molybdenum									
MW-1	Out	12	3	0	Max/mean	1.3E+00	1.0E+00	NA	NA
MW-5	Out	12	11	0	95%UCLOTM	2.2E+00	1.2E+00	2.1E+00	1.2E+00
MW-10	In	17	17	NA	95%UCLOTM	4.7E+01	2.1E+00	4.6E+01	2.1E+00
MW-20-130	In	15	15	NA	95%UCLOTM	1.9E+02	6.2E-01	1.9E+02	6.2E-01
MW-21	Out	6	5	0	Max/mean	1.2E+00	6.7E-01	NA	NA
MW-24B	In	3	3	NA	Max/mean	1.1E+02	8.4E-01	1.1E+02	7.8E-01
MW-30-30	Out	4	2	0	Max/mean	1.9E+00	1.3E+00	NA	NA
MW-38S	In	1	1	NA	Max/mean	2.0E+01	8.2E-01	2.0E+01	8.2E-01
MW-38D	In	1	1	NA	Max/mean	6.3E+00	1.0E+00	5.9E+00	1.0E+00

Table R-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI
MW-44-115	In	3	3	NA	Max/mean	3.0E+01	1.1E+00	NA	NA
MW-44-125	In	1	1	NA	Max/mean	1.0E+01	1.6E+00	9.9E+00	1.6E+00
MW-46-175	In	1	1	NA	Max/mean	6.3E+00	2.5E+00	6.3E+00	2.5E+00
PGE-7	In	2	2	NA	Max/mean	1.2E+02	7.2E-01	1.2E+02	7.1E-01
Average							1.2E+00		1.3E+00
Chromium, hexavalent									
MW-8	Out	6	6	NA	Max/mean	1.9E+00	1.1E+00	1.6E+00	9.2E-01
MW-9	In	35	35	NA	95%UCLOTM	8.6E+00	7.5E+00	8.0E+00	7.5E+00
MW-10	In	37	37	NA	95%UCLOTM	4.7E+01	4.4E+01	4.6E+01	4.4E+01
MW-11	In	34	34	NA	95%UCLOTM	1.9E+01	1.9E+01	1.9E+01	1.9E+01
MW-12	In	40	40	NA	95%UCLOTM	3.0E+01	2.9E+01	3.0E+01	2.9E+01
MW-14	Out	37	36	0	95%UCLOTM	1.2E+00	9.4E-01	1.2E+00	9.4E-01
MW-19	In	34	34	NA	95%UCLOTM	1.9E+01	1.9E+01	1.9E+01	1.9E+01
MW-20-70	In	39	39	NA	95%UCLOTM	2.1E+02	2.1E+02	2.1E+02	2.1E+02
MW-20-100	In	37	37	NA	95%UCLOTM	1.6E+02	1.6E+02	1.6E+02	1.6E+02
MW-20-130	In	38	38	NA	95%UCLOTM	1.9E+02	1.8E+02	1.9E+02	1.8E+02
MW-24A	In	32	32	NA	95%UCLOTM	7.4E+01	7.3E+01	7.4E+01	7.3E+01
MW-24B	In	34	34	NA	95%UCLOTM	1.1E+02	1.1E+02	1.1E+02	1.1E+02
MW-24BR	In	34	1	0	Max/mean	8.2E+00	7.5E+00	NA	NA
MW-25	In	33	33	NA	95%UCLOTM	5.1E+01	5.1E+01	5.1E+01	5.1E+01
MW-26	In	35	34	0	95%UCLOTM	8.1E+01	8.1E+01	8.1E+01	8.1E+01
MW-30-50	Out	45	34	0	95%UCLOTM	2.9E+01	2.9E+01	2.9E+01	2.9E+01

Table R-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI
MW-31-60	In	36	36	NA	95%UCLOTM	8.4E+01	8.4E+01	8.4E+01	8.4E+01
MW-31-135	In	14	14	NA	95%UCLOTM	6.1E+00	6.1E+00	6.1E+00	6.1E+00
MW-34-100	In	79	79	NA	95%UCLOTM	1.6E+01	1.5E+01	1.6E+01	1.5E+01
MW-36-90	In	39	38	0	95%UCLOTM	5.5E+01	5.5E+01	5.5E+01	5.5E+01
MW-36-100	In	51	51	NA	95%UCLOTM	3.3E+01	3.3E+01	3.3E+01	3.3E+01
MW-37D	In	15	15	NA	95%UCLOTM	3.5E+01	3.4E+01	3.5E+01	3.4E+01
MW-38S	In	11	11	NA	95%UCLOTM	2.0E+01	1.9E+01	2.0E+01	1.9E+01
MW-38D	In	11	11	NA	95%UCLOTM	6.3E+00	4.7E+00	5.9E+00	4.7E+00
MW-39-50	Out	18	12	0	95%UCLOTM	3.7E+01	3.6E+01	3.6E+01	3.6E+01
MW-39-60	Out	18	16	0	95%UCLOTM	6.3E+01	6.3E+01	6.3E+01	6.3E+01
MW-39-70	Out	27	27	NA	95%UCLOTM	9.3E+01	9.3E+01	9.3E+01	9.3E+01
MW-39-80	In	40	40	NA	95%UCLOTM	9.5E+01	9.5E+01	9.5E+01	9.5E+01
MW-39-100	In	41	41	NA	95%UCLOTM	1.7E+02	1.7E+02	1.7E+02	1.7E+02
MW-40D	Out	15	15	NA	95%UCLOTM	3.2E+00	1.8E+00	2.7E+00	1.8E+00
MW-44-115	In	32	32	NA	95%UCLOTM	3.0E+01	2.9E+01	3.0E+01	2.9E+01
MW-44-125	In	29	29	NA	95%UCLOTM	1.0E+01	8.2E+00	9.9E+00	8.2E+00
MW-45-095a	In	3	3	NA	Max/mean	5.6E+00	5.6E+00	4.5E+00	4.5E+00
MW-46-175	In	29	29	NA	95%UCLOTM	6.3E+00	3.8E+00	6.3E+00	3.8E+00
MW-47-55	In	8	8	NA	95%UCLOTM	1.2E+00	1.2E+00	1.2E+00	1.2E+00
MW-50-095	In	8	8	NA	95%UCLOTM	5.9E+00	5.9E+00	5.9E+00	5.9E+00
MW-50-200	In	8	8	NA	95%UCLOTM	2.4E+02	2.4E+02	2.4E+02	2.4E+02
MW-51	In	7	7	NA	Max/mean	1.0E+02	1.0E+02	9.9E+01	9.7E+01

Table R-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI
OW-2S	Out	16	15	0	95%UCLOTM	1.7E+00	8.6E-01	1.7E+00	8.6E-01
PE-1	In	24	21	0	95%UCLOTM	2.2E+00	2.2E+00	2.2E+00	2.2E+00
PGE-6	In	18	13	0	95%UCLOTM	2.6E+01	2.6E+01	2.6E+01	2.6E+01
PGE-7	In	16	15	0	95%UCLOTM	1.2E+02	1.2E+02	1.2E+02	1.2E+02
PT-1D	In	2	2	NA	Max/mean	6.6E+01	6.6E+01	6.0E+01	6.0E+01
PT-2D	In	2	2	NA	Max/mean	5.0E+01	5.0E+01	4.3E+01	4.3E+01
PT-3D	In	2	2	NA	Max/mean	9.6E+01	9.6E+01	9.5E+01	9.5E+01
PT-4D	In	1	1	NA	Max/mean	1.3E+02	1.3E+02	1.3E+02	1.3E+02
PT-5D	In	2	1	0	Max/mean	1.3E+02	1.3E+02	6.6E+01	6.6E+01
PT-6D	In	2	2	NA	Max/mean	7.1E+01	7.1E+01	6.0E+01	6.0E+01
PT-7S	In	1	1	NA	Max/mean	2.7E+01	2.6E+01	2.7E+01	2.6E+01
PT-7M	In	1	1	NA	Max/mean	5.1E+01	5.0E+01	5.1E+01	5.0E+01
PT-7D	In	1	1	NA	Max/mean	1.6E+02	1.6E+02	1.6E+02	1.6E+02
PT-8S	In	1	1	NA	Max/mean	3.9E+01	3.8E+01	3.9E+01	3.8E+01
PT-8M	In	1	1	NA	Max/mean	8.7E+01	8.5E+01	8.7E+01	8.5E+01
PT-8D	In	1	1	NA	Max/mean	1.4E+02	1.4E+02	1.4E+02	1.4E+02
PT-9S	In	1	1	NA	Max/mean	2.6E+01	2.5E+01	2.6E+01	2.5E+01
PT-9M	In	1	1	NA	Max/mean	5.2E+01	5.1E+01	5.2E+01	5.1E+01
PT-9D	In	1	1	NA	Max/mean	3.4E+02	3.4E+02	3.4E+02	3.4E+02
PTI-1D	In	1	1	NA	Max/mean	7.2E+01	7.2E+01	7.2E+01	7.2E+01
PTR-1	In	1	1	NA	Max/mean	1.2E+01	1.2E+01	1.2E+01	1.2E+01
PTR-2	In	1	1	NA	Max/mean	7.0E+01	6.9E+01	7.0E+01	6.9E+01

Table R-1. Well-by-Well Hazard Characterization Summary

Location	In/Out of Plume	No. Samples	No. Detections	No. of NDs with the Detection Limit above the RBC	EPC Method	Primary Analysis of the GWRA		Sensitivity Analysis	
						Cumulative HI	Chemical-Specific HI	Cumulative HI	Chemical-Specific HI
TW-1	In	3	3	NA	Max/mean	1.0E+02	1.0E+02	9.1E+01	8.9E+01
TW-2S	In	10	10	NA	95%UCLOTM	1.1E+02	1.1E+02	1.1E+02	1.1E+02
TW-2D	In	12	12	NA	95%UCLOTM	1.2E+02	1.2E+02	1.2E+02	1.2E+02
TW-3D	In	22	22	NA	95%UCLOTM	6.1E+01	6.1E+01	6.1E+01	6.1E+01
Average							6.7E+01		6.6E+01

Notes:

(1) In the primary analysis of the GWRA, estimated EPCs are based on maximum detected concentrations when 95% (UCLs) OTM cannot be reliably calculated with ProUCL 4.0 because there are less than eight samples or less than five detections In the dataset. The sensitivity analysis bases EPCs on mean concentrations when 95%UCLs of the mean cannot be reliably calculated with ProUCL 4.0.

(2) Wells shown are those determined to be material contributors to elevated noncancer hazard based on the methodologies In Appendix R.

(3) NA = Not applicable. Either:

(a) This well was not determined to be a material contributor to elevated noncancer hazard In this analysis.

(b) There are no non-detect results at this well.

EPC = exposure point concentration
HI = hazard Index
ND = not detected
OTM = of the mean
RBC = risk-based concentration
UCL = upper confidence limit
GWRA = groundwater risk assessment

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Appendix S

Responses to Stakeholder
Comments and Comment Resolution

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Infrastructure, environment, buildings

Imagine the result

Pacific Gas and Electric Company

Appendix S: Resolution of Comments from Agencies and Stakeholders on the Draft GWRA for Topock

HERA of Groundwater Impacted by Activities at
SWMU 1/AOC 1 and SWMU 2
Topock Compressor Station, Needles, California

November 2009

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Appendix S

Resolution of Comments from Agencies and Stakeholders on the Draft GWRA for Topock

Table

S-1 Chronology of Response to Comments for Draft GWRA

Acronyms and Abbreviations

GWRA	groundwater risk assessment
PG&E	Pacific Gas and Electric Company

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Appendix S

Resolution of Comments from Agencies and Stakeholders on the Draft GWRA for Topock

1. Introduction

The purpose of this appendix to the final groundwater risk assessment report (GWRA) is to document the resolution of comments on the draft GWRA. The final GWRA incorporates the resolution of comments that is documented in this appendix. It should be noted that some of the responses to comments issued by Pacific Gas and Electric Company (PG&E) on May 29, 2009, have been modified somewhat by subsequent dialogue and comment resolution. As such, this appendix documents the final resolution. Rather than edit and reissue the response to comments document (originally submitted on 5/29/09), this appendix was prepared to document the interactions and resolutions represented by ongoing dialogue between PG&E and the agencies. This approach provides a clearer way to also incorporate additional comments provided by the agencies and stakeholders over the time period from June through September 2009. Table S-1 summarizes the communications between PG&E representatives and agency representatives to resolve questions and comments on the draft GWRA.

In Table S-1, communications are presented chronologically and assigned an item number. The item numbers correspond to the attachments to this appendix. The attachments are hard copies of written communications in the form of memos, letters, documents, and email. This list and the attachments provide a record of the resolution of the comments provided by agencies and stakeholders. In cases where email is used to transmit key information, and there are also documents attached to the email, those documents are given sub-item numbers. For example, Item 10 is an email with two documents attached, Items 10a and 10b. In cases where the communication was a phone call, and call summary notes were not exchanged, there is no corresponding attachment. This is the case for the following items on Table S-1: 4, 14, 15, 16, 17, and 20.

All attachments have been previously submitted to the agencies except Item 25, the response to Fort Mojave Indian Tribe comments on the draft GWRA response to comments. The PG&E responses to those comments are provided here.

Table

Table S-1. Chronology of Response to Comments for Draft GWRA

Item No.	Document/ Meeting	Date Submitted	From	To	Notes
1	PG&E submits GWRA RTC	5/29/09	PG&E	DTSC USDOI	RTC included substantive data to address the two additional pathways for ecological concerns identified by DTSC in 3/30 letter.
2	DTSC comments on GWRA RTC	6/25/09	DTSC	PG&E	Mike Eichelberger (DTSC) accepted RTC (requests information be included in Final GWRA) and introduced additional concern about desert bighorn sheep ingesting nitrate taken up by plants from groundwater. Memo dated 6/17/09.
3	DTSC comments on GWRA RTC	6/29/09	DTSC	PG&E	Shukla Roy-Semmen (DTSC) accepted RTCs with some provisions. Memo dated 6/15/09.
4	Call with DTSC to discuss comment memos and resolution of issues	7/2/09	PG&E	DTSC	Call with PG&E and DTSC representatives (Aaron Yue and Karen Baker) to discuss DTSC comments on RTCs, specifically focusing on the COCs to be carried forward to the CMS/FS. No call notes were exchanged, so there is no attachment for this item.
5	Email – notes summarizing agreed resolution to issues discussed 7/2/09	7/7/09	PG&E	DTSC	Summary of discussions and agreements with DTSC regarding their RTC comments.
6	Email from Aaron Yue providing edits to summary of 7/2 call notes	7/8/09	DTSC	PG&E	Aaron Yue provided suggested edits to the summary of 7/2/09 call notes.
7	Email response from Yvonne Meeks to Aaron Yue's email on 7/2/09 call notes	7/13/09	PG&E	DTSC USDOI	Yvonne Meeks acknowledged receipt of Aaron Yue's comments and that USDOI need not respond to the discussion of DTSC comments.
8	Email from Yvonne Meeks with path forward on issues from 7/2/09 call	7/16/09	PG&E	DTSC	Summary follow up of outstanding issues from 7/2/09 call and path forward suggestions.
9	Comment letters from DTSC and FMIT on PG&E's GWRA RTCs	7/16/09	DTSC FMIT	PG&E	Final comments on RTCs from DTSC (Shukla Roy-Semmen and Mike Eichelberger) [note; the attached DTSC documents were the same comment memos dated 6/17/09 and 6/15/09, cited in Items 2 and 3]; Letter by Mike Sullivan dated 7/10/09 with comments on GWRA on behalf of FMIT (document 9a), and letter dated 7/13/09 from FMIT Chairman Timothy Williams to DTSC's Maziar Movassaghi (Item 9b).
10	Email from PG&E for path forward on resolving DTSC response comments on GWRA RTC	7/28/09	PG&E	DTSC	Provided suggestions on resolving outstanding issues for the GWRA, including supplemental eco information on desert bighorn sheep distribution (Item 10a) and nitrate concentrations in GW (Item 10a) and references (Item 10b).
11	Final comments from USDOI on GWRA RTCs, and USDOI response to FMIT	8/3/09	USDOI	PG&E	USDOI provided comment letter on RTCs for the GWRA (Item 11b). Letter from USDOI response letter to Taylor, FMIT dated 7-31-09 also included (Item 11a).
12	Email - DTSC response to PG&E's 7/28/09 email on suggested path forward to resolve GWRA RTCs.	8/3/09	DTSC	PG&E	Aaron Yue provided additional information on DTSC direction for RTC resolution, including Mike Eichelberger's requests regarding specific attention to Curt Russell's information on observations of desert bighorn sheep outside the area shown in the CNDDB.
13	Email - DTSC additional response to PG&E's 7/28/09 suggested path forward	8/6/09	DTSC	PG&E	Aaron Yue provided additional input on path forward following 8/5/09 RCRA/CERCLA meeting discussion and further internal DTSC discussion.
14	Call with DTSC re: nitrate	8/12/09	PG&E	DTSC	Discussion with Mike Eichelberger on desert bighorn sheep and potential exposure to nitrate in plants. No call notes were exchanged, so there is no attachment for this item.
15	Call with USDOI re: seeps	8/18/09	PG&E	USDOI	Call with Carrie Marr to discuss potential eco exposure to water in seeps. No call notes were exchanged, so there is no attachment for this item..
16	Call with USDOI re: comments on human health RTCs	8/20/09	PG&E	USDOI	Call with Dennis Smith to resolve outstanding USDOI comments on human health evaluation in GWRA and RTCs. No call notes were exchanged, so there is no attachment for this item.
17	Call with USDOI re: seeps	8/24/09	PG&E	USDOI	Call between Yvonne Meeks and Pam Innis to discuss seeps in canyon wall of East Ravine. No call notes were exchanged, so there is no attachment for this item.
18	Email response to outstanding USDOI comments on GWRA RTCs	8/25/09	PG&E	USDOI	Email to respond to USDOI's 8/3/09 comments on the GWRA RTCs.
19	PG&E submits draft eco Appendix "X" [1] to Mike Eichelberger for advance review.	8/28/09	PG&E	DTSC	Appendix "X"[1] contains additional information to address DTSC's comments on the three issues raised after development of RAWP: • Risk to deep-rooted plants to contaminated GW • Risk to shallow-rooted plants to contaminated GW • Risk to desert bighorn sheep from nitrate exposure
20	Call with DTSC to discuss DTSC's comments on Appendix "X" [1]	9/8/09	PG&E	DTSC	Call with Mike Eichelberger, who concurred with approach to nitrate/bighorn sheep assessment. Requested additional detail supporting no risk to shallow-rooted plants. Made additional request for evaluation of risk to upper trophic levels via plant uptake and subsequent eco consumption. No call notes were exchanged, so there is no attachment for this item.
21	Email from Pam Innis to PG&E	9/8/09	USDOI	PG&E	Pam Innis confirmed USDOI acceptance of PG&E's suggested comment resolution sent via email 8/25/09.

Table S-1. Chronology of Response to Comments for Draft GWRA

Item No.	Document/ Meeting	Date Submitted	From	To	Notes
22	DTSC final comments on Appendix "X"[1]	9/16/09	DTSC	PG&E	Mike Eichelberger submitted final comments on draft Appendix "X" in memo dated 7/10/09.
23	Email from PG&E's suggested path forward for Appendix "X" [1] comments	9/17/09	PG&E	DTSC	Provided path forward to resolve comments from Mike Eichelberger on draft Appendix "X." [1]
24	Email from DTSC re: Appendix "X" [1]	9/21/09	DTSC	PG&E	Aaron Yue sent concurrence with acceptance of COPECs and responses for Appendix "X." [1]
25	Emails between Yvonne Meeks and Pam Innis re: East Ravine groundwater	10/5/09 10/7/09	PG&E USDOI	USDOI PG&E	Yvonne Meeks suggested an alternative to previous USDOI direction (see item 11) to prepare a screening level risk assessment for East Ravine groundwater as an appendix to the CMS/FS. Pam Innis agreed that a separate document would be acceptable, since East Ravine groundwater data collection may not be completed in time for the CMS/FS.
26	Response to FMIT comments on RTCs	10/12/09	PG&E	DTSC FMIT	Responses to comments from FMIT on GWRA RTCs are included in Appendix S of final GWRA.
27	DTSC final comments on October 2009 GWRA RLSO	10/28/09	DTSC	PG&E	Aaron Yue submitted final comments on the October 2009 GWRA. RLSO
28	USDOI/USFWS comments on October 2009 GWRA RLSO	11/5/09	USDOI USFWS	PG&E	Carrie Marr submitted final comments on the October 2009 GWRA RLSO.
29	Email from PG&E re: USDOI/USFWS comments on October 2009 GWRA RLSO	11/9/09	PG&E	USDOI USFWS DTSC	Response to USDOI/USFWS final comments on the October 2009 GWRA RLSO. PG&E responded to the general comment, which required no change to the GWRA. PG&E will make the changes suggested in Specific Comments 1 through 8 in their entirety as modified in the response email.
30	Email from USDOI/USFWS re: PG&E response to USDOI/USFWS comments on October 2009 GWRA RLSO	11/10/09	USDOI USFWS	PG&E	Pam Innis responded that PG&Es responses were acceptable to USDOI/USFWS final comments on the October 2009 GWRA RLSO.
31	Email from DTSC re: PG&E response to USDOI/USFWS comments on October 2009 GWRA RLSO	11/10/09	DTSC	USDOI USFWS PG&E	Aaron Yue responded that DTSC does not object to PG&Es proposed responses to USDOI/USFWS final comments on the October 2009 GWRA RLSO.

Notes:

(1) Appendix X discussed in this table and attached email communication became Appendix I when incorporated into the revised GWRA.

CERCLA/RCRA = Comprehensive Environmental Response, Compensation and Liability Act/ Resource Conservation and Recovery Act
CMS/FS = Corrective Measures Study/Feasibility Study
CNDDB = California Natural Diversity Database
COCs = chemicals of concern
COPECs = chemicals of potential environmental concern
DTSC = Department of Toxic Substances Control
FMIT = Fort Mojave Indian Tribe
GWRA = groundwater risk assessment
PG&E = Pacific Gas and Electric Company
RLSO = redline/strikeout
RTC = response to comments
USDOI = U.S. Department of the Interior

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Attachments

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RESPONSE TO COMMENTS

Comments on the February 2009 Draft *Groundwater Human Health and Ecological Risk Assessment*
Pacific Gas and Electric, Topock Compressor Station, Needles, California

Note: Most references cited in responses can be found in the reference list of the GWRA. Those not provided in the GWRA are either footnoted or sufficiently described in text.

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Comment Number Code Legend

For ease of use, the comments have been organized in alpha-numeric order.

CRIT	Colorado River Indian Tribes (submitted by Envirometrix Corporation)
DOI	U.S. Department of the Interior (submitted by Pam S. Innis on behalf of DOI, U.S. Bureau of Land Management, the U.S. Fish and Wildlife Service, and the Bureau of Reclamation collectively)
FMIT	Fort Mojave Indian Tribe (submitted by Michael J. Sullivan, PhD, CIH)
HERD-JME	Department of Toxic Substances Control, Human and Ecological Risk Division (submitted by J. Michael Eichelberger, PhD)
HERD-SRS	Department of Toxic Substances Control, Human and Ecological Risk Division (submitted by Shukla Roy-Semmen, PhD)
MWD	Metropolitan Water District (submitted by Bart Koch)

Comment Number	Section/ Page	Comment	Response	Comment Category
FMIT GC1		Sequencing of Project Reports. The overall timing of the various deliverables for the Topock project is out of proper sequence according to Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental, Response, Cleanup, and Liability Act (CERCLA) guidance. The draft Corrective Measures Study/Feasibility Study (CMS/FS) report for chromium in groundwater was submitted on January 27, 2009. This was followed by the GWRA risk assessment (focus of this review). In practice, the GWRA is the basis for the CMS/FS. However, even the GWRA was delivered only a very short time after the finalization of the risk assessment work plan (RAWP) addendum was published. DTSC management should insist on an appropriate report delivery order and schedule for future deliverables. The ability of the Tribe to provide appropriate and meaningful comments on these documents would be helped by a proper delivery schedule.	Comment noted. Pacific Gas and Electric Company (PG&E) has followed scheduling of deliverables according to California Department of Toxic Substances Control (DTSC) and federal agency direction.	2
FMIT GC2		Description of Ecosystem. The report provides several broad statements regarding terrestrial wildlife. For example, the text states that terrestrial wildlife has 'low diversity' because the area is disturbed and the wildlife corridor is incomplete (pg 2-3, pp2), the BCW is 'relatively barren of vegetation' (page 2-3, pp3) and that only 'small patches of emergent vegetation exist along the banks of the Colorado River' (page 2-3, pp2). These text descriptions do not accurately reflect the ecosystem at and including the site. The Tribe's view is that the local desert ecosystem and plant/animal life are worthy of protection, especially when the cumulative land disturbance impacts of both groundwater and soil remediation activities are considered and when a less transitory view of animal and plant life usage is considered. Second, the area surrounding and adjacent to the remediation include areas designated as wildlife refuges, thereby showing that at least the federal government understands the nature of area's typical desert environment. Third, this text does not address any plants at the site that the Tribe considers important for ceremonial or medicine purposes. Both Mesquite and Creosote plants are related to Tribal activities at the site and are harvested for its sacred and Tribal uses of this area.	PG&E concurs that the local desert ecosystem is worthy of protection and is proposing the following text revisions to more clearly reflect that position. The following sentence will be inserted as the first sentence of paragraph 2 on page 2-3: "Upland areas of the APE include the Havasu National Wildlife Refuge, which was established to protect and conserve wildlife." The text on page 2-3 in paragraph 2 regarding terrestrial wildlife diversity will be replaced with "Terrestrial wildlife found at the site is characteristic of desert environments and is adapted to the interrelated conditions of drought, temperature extremes, and the sparse or unpredictable food supply of the desert habitats found at the site." The text on page 2-3 in paragraph 3 regarding the distribution of vegetation in Bat Cave Wash (BCW) will be replaced with "BCW consists of areas of unvegetated sand, gravel, and cobblestone substrate interspersed with widely spaced desert wash vegetation including mesquite and creosote." The text on page 2-3 paragraph 4 regarding small patches of emergent vegetation will be expanded to include "…such as common reed (*Phragmites communis*), cattails (*Typha* sp.), sedges (*Carex* sp.), and bulrush (*Scirpus* sp.),…" to focus and better define the discussion.	3
FMIT GC3		Description of Tribal Interests in Maze Area. There is only a single sentence that identifies the Topock area as having spiritual meaning to the Tribes. The Tribe reiterates its request that the following text be used in project documents to describe the relationship of the land with the tribal cultural and spiritual values. "The compressor station is located in a sparsely-populated, rural area, comprising a series of benches and terraces overlooking the Colorado River floodplain. The land surrounding and including the compressor station, including the benches and terraces on both sides of the river, the floodplain, the river itself, and the surrounding hills and mountains, comprises a cultural landscape that figures importantly in the traditional spiritual and cultural life of the Aha Makav or Fort Mojave Indian Tribe. One important component of this landscape, known as the Topock Maze, directly surrounds and includes the compressor station. The Maze is a complex of windrows raked in the desert pavement, running in several directions for many tens of meters. Although portions of this site have been disturbed by construction and unsympathetic land use (as have some other parts of the cultural landscape	This comment is similar to a comment received by FMIT on the *Revised Final RCRA Facility Investigation /Remedial Investigation Report Volume 2* (Revised Final RFI/RI Volume 2; CH2M HILL, February 2009). As previously indicated by DTSC in their October 21, 2008, letter to PG&E, "DTSC believes the statements currently in the Volume 2 RFI Report reflect the importance of the area to all Tribes. Additional clarifications and cultural significances of the area by specific Native American Tribes should be a topic of documentation for the up coming Environmental Impact Report." For consistency, the final GWRA will incorporate the same language regarding Tribal cultural and spiritual values as was used in the Revised Final RFI/RI Volume 2. Specifically, the following language will be added to the GWRA for consistency with the Revised Final RFI/RI Volume 2: "The compressor station is located in a sparsely-populated, rural area. The surrounding land lies within an area of significant cultural and sacred Tribal resources. Portions of the Topock Maze are located nearby. The maze is a geoglyph (ground marking) and is of importance to the local Native American community. The area is within the traditional territory of the Aha Makav or	3

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Comment Number	Section/ Page	Comment	Response	Comment Category
		surrounding and including it), the Maze and its surroundings continue to play significant roles in the lives and cultural beliefs of the Fort Mojave Indian Tribe and other tribes along the Colorado River. The Fort Mojave Indian Tribe has expressed the opinion that whatever happens in the overall cultural landscape is of concern to the Tribe, which wishes to be consulted about all activities planned or proposed in the area." In addition, the text lists the current river recreational activities as sightseeing, bird watching, fishing, hunting, camping and canoeing (pg 2-5, pp5). Other activities Tribal members have observed include tubing, rafting, sunning, swimming and tours. However, there are also Tribal activities along the river shoreline that are related to the religious, cultural, and ceremonial activities (as opposed to public recreation). These activities are an integral and necessary component of Tribal culture and must therefore be considered by risk managers.	Mojave tribe. While the material remains of the past are important to these tribes, this area of traditional and spiritual use knows no boundaries for the Mojave." As indicated in the *Human Health and Ecological Risk Assessment Work Plan* and subsequent Addendum (RAWP; ARCADIS, 2008; 2009), a Tribal-use scenario will be included in the soil risk assessment considering input to be provided by the Tribes for their religious, cultural, and ceremonial activities. In accordance with the RAWP, the GWRA determined that the river has not been adversely impacted by site constituents of potential concern (COPCs). Therefore, Tribal activities along the river shoreline related to the religious, cultural, and ceremonial activities that include contact with the surface water are not adversely impacted by the site COPCs. Please note that we will expand the list of activities on pg 2-5 (paragraph 5) to include religious, cultural, and ceremonial activities and recreational activities, such as bird watching, fishing, canoeing, tubing, rafting, and swimming.	
FMIT GC4		Future Land Uses. There are future land-use issues in the GWRA that need to be clarified. First, DOI has requested that a stretch of the floodplain area along old Route 66 be evaluated for potential future scenario involving the development of housing and recreational areas (pg 2-6, pp5). This results in the risk assessment assumption of future residential use of groundwater produced from local wells. This proposed future land use scenario poses Tribal concerns, especially if such development were to occur in the vicinity of the Maze. In a separate letter, the Tribe will provide text that describes appropriate land uses for this area. Second, the future ownership of the IM land as well as potential repatriation of the Topock Compressor site to the Tribe is not mentioned. The potential for future control of these lands by the Tribe further increases the importance of current Tribal concerns regarding protecting the land as well as defining future land uses that should be evaluated in the GWRA.	The future land use discussion in the GWRA is based on assumptions regarding current and future land use, as provided by the agency and the landowner (USDOI, 2007), for lands outside the compressor station. As we have previously stated, we believe that the currently proposed land uses and receptors will provide the risk managers with the necessary information to make informed management decisions for the known and anticipated future land uses for all areas of the site. PG&E has not yet received the letter referred to in this comment, but understands that the FMIT will be submitting such a letter at some point in the future. Under the terms of the settlement of the Sacramento Superior Court Action No. 05CS00437, filed with the court on April 4, 2005, title to that property referred to generally as the IM3 property is expected to transfer to the FMIT. The property will be subject to a site-wide easement in favor of PG&E also on file with the Court as set out above and recorded in the official records of San Bernardino County. The allowed use of the IM3 property during remediation activities as required by DTSC and USDOI are set out in the settlement agreement and easement documents. Other than use for remediation purposes, the IM3 property is subject to a recorded Covenant and Environmental Restriction on Property, recorded in the official records of San Bernardino County that sets out possible future use of ground water. For groundwater, residential potable use of groundwater is typically considered to be the upper bound (i.e., most conservative) use pattern for groundwater. The default exposure scenario represented in the GWRA assumes that groundwater is the only source of potable water and it is used for a lifetime. The GWRA evaluates this intense contact with groundwater on a well-by-well basis. It is likely that consideration of concentrations that are health protective for unrestricted potable drinking water use for each well are also health protective for other or additional Tribal activities that may include direct contact with groundwater.	3

RESPONSE TO COMMENTS
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Comment Number	Section/ Page	Comment	Response	Comment Category
			As to the future use of the compressor station property, it will remain in its current use and potentially in support of remediation activities until PG&E determines that it is no longer needed for utility or remediation purposes. This condition is not anticipated to occur in the foreseeable future. If and when PG&E makes such a determination, the FMIT has the option to purchase the property. The terms of the option to purchase and of its exercise are set out in the settlement agreement and option agreement that is attached thereto as an exhibit, as referred to above.	
FMIT GC5		Use of non-health-based comparison criteria. The GWRA in several steps of the assessment utilizes non-health-based criteria to eliminate COPCs and groundwater well locations from the risk assessment and consideration in the CMS/FS, respectively. A few examples include frequency of COPC detection in wells (pg 3-2, pp2), elimination of 'data collected by others' (pg 3-2, pp4), consideration of general chemical parameters (pg 3-7. pp2), and the use of MCLs (pg 3-10, footnote). While some of these actions do not significantly impact site risk estimates, they are not appropriate risk assessment methodologies. Future risk assessments should present a comprehensive understanding of project risks so that informed risk management decisions can be made.	The GWRA does not use non health-based criteria to eliminate COPCs or well locations from consideration in the GWRA. Screening of site data for selection of COPCs was conducted consistent with the technical approach presented in the approved RAWP and associated regulatory guidance. Frequency of detection was not used as a COPC selection criterion for detected compounds. As described in paragraph 2 on page 3-2, a compound was not selected as a COPC if it was never detected at the well in the RFI/RI site dataset. Paragraph 4 on page 3-2 points out that, consistent with the approved RAWP and regulatory guidance, the GWRA evaluated the dataset for the site as identified in the Revised Final RFI/RI Volume 2 (CH2M HILL, 2009) and the RFI/RI Volume 2 Addendum (CH2M HILL, 2008a). The GWRA did not further eliminate any data or data sources accepted in the RFI/RI documents, and relied on the site dataset as defined by the RFI/RI documents. As the same paragraph further points out, the GWRA did, however, include one additional surface water dataset collected by the Metropolitan Water District, which was made available after the closing date for data to be considered in the RFI/RI documents. Maximum contaminant levels (MCLs) were not used as a general COPC selection criterion. They were used as a screening tool only for a subset of chemicals, per the approved RAWP. The last two paragraphs on page 3-9 and first paragraph on page 3-10 (and associated footnote) describe how the RFI/RI documents identified the extent of the hexavalent chromium plume by using the chromium MCL. The GWRA used this same definition of the hexavalent chromium plume to categorize wells as being within or outside the plume. The purpose of this grouping for the wells was to provide perspective for wells outside the hexavalent plume to see if planned future treatment of that plume area might miss any key wells or compounds of significant hypothetical health risk to a future domestic user of the groundwater. The categorization of wells either within or outside the plume, however, was not used as a basis for eliminating COPCs from the risk assessment. In accordance with the approved RAWP, appropriate risk assessment methodologies were used in the GWRA that can form the basis of informed risk management decisions.	3
CRIT C1		A site-specific groundwater background level of 32 µg/L hexavalent chromium (Cr-6) is used in the risk assessment. We do not agree that the natural background groundwater conditions should be equally applied from the upland area to the fluvial aquifer near the Colorado River. Although within the upper background range reported for this region (Ball and Izbicki, 2004), this is unusually high relative to most locations in the United States. For example, at the Hinkley PG&E site, the average background	The *Revised Groundwater Background Study Steps 3 and 4: Final Report of Results* (Groundwater Background Study; CH2M HILL, 2008c) upper threshold limit (UTL) represents the 95% statistical upper tolerance level, meaning that only 5% of all wells would be expected to exceed 31.8 micrograms per liter (µg/L). The fact that average values (50% values in terms of statistics) are much lower does not mean that this UTL is particularly elevated compared to other areas. The mean chromium concentration in the	1

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FMIT	Fort Mojave Indian Tribe (submitted by Michael J. Sullivan, PhD, CIH)
HERD-JME	Department of Toxic Substances Control, Human and Ecological Risk Division (submitted by J. Michael Eichelberger, PhD)
HERD-SRS	Department of Toxic Substances Control, Human and Ecological Risk Division (submitted by Shukla Roy-Semmen, PhD)
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		concentration of Cr-6 was 1.2 µg/L with a maximum of 2.7 µg/L. In a survey of California drinking water sources, Cr-6 was not even detected in 70% of the sources (detection limit 1 µg/L), and in almost 90% of the sources in which it was detected, the maximum concentration was 10 µg/L or less (California Department of Public Health [CDPH], 2007). Even though there is an entire report referenced regarding development of background concentrations, some explanation of this high background, for example a brief discussion of how local geology, pH and/or oxidation state of the groundwater cause the higher background, should be provided in the risk assessment itself. Cr-6 is the main focus of this risk assessment yet neither of the main sections that discuss groundwater background (Sections 3.2.1.1 or 3.2.3.1) even mention Cr-6, much less explain the high background level of Cr-6 assumed for the risk assessment. CRIT is in the process of conducting a technical review of the groundwater background report.	Groundwater Background Study was 8.9 µg/L. Having 90% of samples be below detection limit also would not apply: it is the upper half of the remaining 10% of the dataset that determines the UTL, not the average or number of non-detects (NDs). The UTL calculated for this study is in general agreement with the U.S. Geologic Survey (USGS) observations for groundwaters eminating from granitic source rocks in the Mojave Desert, which showed chromium concentration up to 36 µg/L. The nearby Sacramento Valley, Arizona, groundwater study determined a mean total chromium concentration of 42 µg/L. The greater value may be influenced by more mafic volcanic source rocks in some parts of the surrounding mountains of that valley. More mafic rocks tend to contain higher concentrations of transition metals, including chromium. We also note that to the extent there are uncertainties/questions regarding the background hexavalent chromium concentrations, these uncertainties/questions are related to the characterization efforts, not the risk assessment efforts. Thus, discussions regarding the different variables that can result in higher background concentrations for hexavalent chromium belong in the characterization studies, not the risk assessment.	
CRIT C2		Although the risk assessment clearly states that the objective is to address risks related to groundwater, there should be statements added to the introduction explaining how and when other health risks at the site (e.g. due to exposure to contaminated soil) will be addressed. In other words, this groundwater risk assessment needs to be placed in context with the risk assessment of soils. In addition, there should be statements indicating why the groundwater risks are being addressed in this manner (i.e. as a separate risk assessment) rather than together with other site health risks (i.e. soils).	See also responses to comments FMIT GC1 and DOI SC21. Language will be added to clarify that both groundwater and soil contributions to overall potential risk will be ultimately addressed for the site once data collection, site characterization, and risk assessments have been completed for both media. Preparation of separate risk assessment documents for groundwater and soil is being done to comply with DTSC's request that the groundwater remedy be developed prior to the completion of all soil investigations, which is entirely consistent with our experience on other sites in which decisions regarding operable units (OUs) to be made independently.	3
CRIT C3		Because risks at the site are presently being addressed separately (i.e. groundwater risk assessment, soils risk assessment) there is a need to account for cumulative risks across all media. For example, cumulating risks due to groundwater pathways with risks due to soil exposure. This point should be addressed in the introduction as part of the context discussion noted above.	See response to comment CRIT C2.	3
CRIT C4		Given the focus of the risk assessment on groundwater, a section of text needs to be added which clearly states where the closest wells in the area are that are known to be used by local individuals for drinking water, irrigation, or watering livestock, etc. A map showing these wells in relation to the plume boundary would be appropriate. This map should be included in the risk assessment and not incorporated by reference. It is very important to make it clear to the reader how likely it is that the plume could actually reach wells that are in fact currently used for drinking water, irrigation, or other uses.	As suggested, the final GWRA will incorporate language that identifies the known active supply wells in the area of potential effects (APE), and will identify these wells on a figure. The proposed figure is presented as an attachment to these Responses to Comments (RTCs). As indicated on the attached Figure 1, there are two known active supply wells in the APE: PM-04, located in Park Moabi (on the northwest section of the APE), and Sanders, located on the Arizona side of the Colorado River.	3
CRIT C5		The Conceptual Site Model (CSM) included in the risk assessment is not specific for groundwater which is the scope of this report. A revised CSM should be prepared which focuses on groundwater and	Figure 5-1 in the GWRA provides the conceptual site model (CSM) for potential exposures resulting from chemically affected groundwater. The CSM is discussed in the text in Sections 5.1 through 5.5. Use of	3

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		groundwater related exposure pathways. In addition, the risk assessment does not discuss the CSM to any extent, in particular how it was developed, even though the CSM is the foundation of any risk assessment. The CSM is a graphical representation showing the primary source of the contamination, mechanisms for release into the environment, secondary sources, potential exposure pathways, and receptor populations. The CSM should be accompanied by a text discussion in the main report which states how it was developed, including assumptions used. The risk assessment apparently relegates this discussion to the risk assessment workplan. This is not sufficient. In particular, the discussion should explain why some potential groundwater exposure pathways (e.g. crop irrigation, home garden produce irrigation and consumption, use in cooking, livestock watering, Tribal traditional cultural practices, etc.) were not included in the quantitative risk assessment, whether that is because the exposure pathway was determined to be incomplete, or complete but negligible. The risk assessment does not adequately justify limiting the scope of this groundwater risk assessment to drinking water ingestion and dermal contact. For example, hypothetical future residents are considered the relevant receptor population in the risk assessment. Could future residents realistically use the groundwater for irrigation of home gardens? If this or other potential exposure pathways are considered not relevant or negligible an explanation should be provided to justify excluding them from the risk assessment.	groundwater as a potable drinking water source and designing remediation to meet those goals are typically considered to be the most stringent criteria available. The GWRA used default exposure assumptions for hypothetical future potable use to include direct dermal contact and ingestion pathways suitable to address use of the groundwater for drinking, cooking, and bathing, as presented in the approved RAWP. Please refer to response to comment DOI SC20 for a discussion of potential secondary pathways associated with exposure to groundwater (i.e., ingestion of plant and animal products as a pathway for exposure to contaminated groundwater). As indicated, the final GWRA will include an appendix that describes why these secondary pathways associated with use of impacted groundwater would not materially change the conclusions of the groundwater risk assessment.	
CRIT C6		Section 5.6 Exposure Point Concentrations (EPC) This section states that the EPC is defined as the "average concentration" and "represents a reasonable estimate of the concentration likely to be contacted over time". The EPC is actually an upper-bound or at least conservative estimate of the concentration expected to be contacted over time since it typically consists of either the 95% upper confidence limit of the mean or the maximum detected concentration.	Comment noted. We agree that the EPC is a conservative, upper-bound estimate of the concentration expected to be contacted over time.	3
CRIT C7		The risk assessment assumes that Cr-6 is not carcinogenic via the oral route of exposure. However, a recent National Toxicology Program (NTP) study demonstrated that Cr-6 is carcinogenic in both mice and rats via the oral route of exposure (drinking water) (NTP, 2008; Stout et al., in press). This confirms findings of earlier studies. It is expected that as a result of this study, the California Office of Environmental Health Hazard Assessment (OEHHA), currently charged with developing a drinking water Public Health Goal for Cr-6, is going to soon reclassify Cr-6 as carcinogenic via the oral route of exposure. It is further expected that a cancer potency factor for Cr-6 will be developed by OEHHA as part of the development of the Public Health Goal. This new development should be noted in the risk assessment. In addition, the risk assessment should eventually be revised to reflect the carcinogenic effect of Cr-6 via the oral route of exposure using the new cancer potency factor expected to be developed and released by OEHHA soon.	See response to comment HERD-SRS GC3. A discussion of the uncertainty associated with the potential classification of hexavalent chromium as an oral carcinogen is presented in Section 9.5 of the GWRA. A peer-reviewed value is not yet available from the Office of Environmental Health Hazard Assessment (OEHHA). According to the U.S. Environmental Protection Agency (USEPA) Integrated Risk Information System (IRIS) website (USEPA, 2009), toxicity evaluation of hexavalent chromium is scheduled to complete peer review in late 2012.	No change
HERD-JME		HERD found little to review in regards to hazard to ecological receptors from groundwater underlying the Topock Compressor Station. The report provides tables listing ecological receptors found on site and a listing of surface water criteria taken from the 2008 from the Remedial Action Work Plan (RAWP). What is	PG&E concurs with HERD's request to expand the GWRA to incorporate additional evaluation of two additional potential exposure pathways for ecological receptors. PG&E also notes that the scope of the GWRA was established in the approved RAWP. The approved RAWP contains Figure 6-1, Ecological	2

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		lacking from the report is a discussion of potential exposure pathways to ecological receptors. Without this information there is little to review. From the HERD standpoint there is potentially three potential pathways for exposure to ecological receptors; 1) Deep rooted phreatophytic upland plants extending their roots down to the groundwater (i.e., .Mesquite-Prosopis glandulosa), 2) More shallow rooted plants along the margins of the river and the wetland at the mouth of Bat Cave Wash such as tamarisk (Tamarix sp.), and 3) movement of groundwater to the river. Each of these potential pathways should be described in the report. To date, sampling has not demonstrated movement of the groundwater plume to the Colorado River. There is also no evidence that tamarisk or other plants adjacent to surface water such as the river or the pond at the mouth of Batcave Wash have their roots at depth where they would intercept groundwater plumes containing site COPECs. It is more likely that these plants do not have deep roots since they have ready access to adjacent surface water. The pathway to upland phreatophytes is more problematic and difficult to quantify. These types of questions should be included in the report with substantive data regarding potential rooting depths and depth to groundwater plumes containing COPECs. The report needs to go beyond a description of exiting habitat and describe how the habitat and ecological receptors could be exposed to COPECs in groundwater. It may well be that impacts are minimal or non-existent but the reasoning must be presented.	Conceptual Site Model, explaining that the groundwater pathway to be assessed in the GWRA is a potential connection with interstitial water (i.e., porewater) and surface water. PG&E implemented the approved RAWP and the scope of the discussion that appears in the GWRA is consistent with the CSM in the RAWP; that is, the discussion focuses on the potential transport pathway to the river. Nevertheless, PG&E will expand the GWRA to address HERD's new request. HERD has observed that there are two additional pathways (in addition to potential transport to the river) of interest to HERD at the site: 1) shallow-rooted plants in the riparian area contacting chemically affected groundwater and 2) phreatophytic upland plants contacting chemically affected groundwater. To address HERD's concerns, PG&E has performed an evaluation of the additional potential pathways below and will expand the revised GWRA accordingly. The evaluation focuses on chemicals of potential concern (COPCs) from the Revised Final RFI/RI Volume 2 (CH2M HILL, 2009): hexavalent chromium, selenium, molybdenum, and nitrate. Nitrate in the groundwater is a nutrient beneficial to the terrestrial ecosystem. Because desert plant communities typically are limited by nitrogen during growing periods (Zak and Whitford, 1988[1]), nitrate uptake from the groundwater is expected to have beneficial rather than adverse effects on the plants. For example, in a desert system in Arizona the phreatophyte, *Atriplex canescens*, growing over a shallow groundwater plume with high concentrations of nitrate (maximum nitrate-N concentration = 300 milligrams per liter [mg/L]), accumulated 5 times more nitrate in its leaves during summer than plants growing off the plume (up to 500 milligrams per kilogram [mg/kg] nitrate-N in leaf tissue; McKeon et al., 2006[2]). The study estimated that at the McKeon site, 40 kg of plume water would supply sufficient nitrogen for production of 1 kg of plant biomass. Isotope analysis indicated most of the nitrate came from the groundwater plume. The increased nitrate in the plant tissues produced no phytotoxicity (McKeon et al., 2006). In Topock shallow groundwater wells that were selected to best represent concentrations potentially contacting phreatophytic vegetation[3], the maximum nitrate-N concentration is 16.4 mg/L (at MW-11), much lower than the concentrations in the McKeon et. al. (2006) study. Therefore, nitrate will not be considered further as a COPC in the groundwater ecological risk assessment. Potential exposure to the remaining COPCs (hexavalent chromium, selenium, and molybdenum) depends on depth to groundwater, root depths, and chemical distribution in the groundwater. These factors are discussed further below. Groundwater level data for water table wells were obtained from Appendix B of the Revised Final RFI/RI Volume 2 (CH2M HILL, 2009) and Appendix B of the *Monitoring Report for the Floodplain Reductive Zone In-Situ Pilot Test* (ARCADIS, 2007[4]). Depth-to-water data for water table wells are displayed on Figure 2. Only wells with depths to groundwater shallower than 80 feet below ground surface (bgs) were	

1 Zak, J., and W. Whitford. 1988. Interactions among soil biota in desert ecosystems. Agriculture, Ecosystems, and Environment 24(1-3):87-100.

2 McKeon, C., E.P. Glenn, W.J. Waugh, C. Eastoe, F. Jordan, and S.G. Nelson. 2006. Growth and water and nitrate uptake patterns of grazed and ungrazed desert shrubs growing over a nitrate contamination plume. Journal of Arid Environments 64:1-21.

3 The wells were selected based on the following criteria: maximum depth to groundwater of 80 feet below ground surface (ft bgs), co-location with phreatophytic vegetation, or, where wells were not available in phreatophytic vegetation, the nearest upgradient well. MW-11 was the only well selected that is not co-located with phreatophytic vegetation. MW-11 was selected to represent concentrations upgradient of phreatophytes in Bat Cave Wash.

4 ARCADIS, 2007. May 2007 Monitoring Report for Floodplan Reductive Zone In-Situ Pilot Test. Topock Compressor Station, Needles, California. Pacific Gas and Electric Company, June.

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			considered in this assessment; wells where groundwater occurred deeper were considered beyond depths of interest for phreatophyte exposure (see below for discussion of root depths). Depths to water are as shallow as approximately 4 feet bgs near the river. Depth-to-water data, as well as an understanding of plant root depths, form the basis of the exposure evaluation. The potential exposure pathway for shallow-rooted riparian plants was evaluated qualitatively by reviewing depth-to-water data, considering geochemical processes that operate in wetland environments, and reviewing COPC concentrations in groundwater. Historical depth-to-water measurements suggest that shallow groundwater may not discharge at wetland areas (Figure 2). Shallow-rooted plants such as common reed (*Phragmites communis*), cattails (*Typha* sp.), sedges (*Carex* sp.), and bulrush (*Scirpus* sp.) may not contact groundwater given that the shallowest depth to water measured near the river is approximately 4 feet (CH2M HILL, 2009) and these plants have ready access to surface water. Deeper-rooted plants, such as salt cedar and arrowweed, present immediately adjacent to the river or ponded water at the mouth of BCW also have ready access to the surface water. As HERD stated, sampling has not demonstrated movement of the groundwater plume with COPCs into the Colorado River. Further, the reducing conditions in wetland areas would result in precipitation of hexavalent chromium, selenium, and molybdenum binding the metals and reducing bioavailability. Hexavalent chromium and selenium were not detected in shallow wells nearest the river (MW-28-25, MW-29, and MW-27-20); molybdenum was either not detected or present at a concentration below the background UTL in these wells (Figure 3). The data suggest riparian plants along the river are unlikely to take up the COPECs from the groundwater. Therefore, this shallow-rooted riparian plant pathway is considered insignificant and will not be evaluated further. The potential exposure pathway for deeper rooted upland plants (phreatophytes) was evaluated quantitatively by first assessing the potential for root contact with chemically affected groundwater, then considering groundwater concentrations of COPCs where contact may occur. Table 1 (attached) provides maximum root depths for phreatophytes identified at the site showing that some species, such as honey mesquite (*Prosopis glandulosa*) can have roots up to 50 feet deep. Depths to water in the BCW and on the east side of National Trails Highway where phreatophytes occur range from 30 feet bgs to 4 feet bgs. Deep-rooted phreatophytic upland plants may contact COPCs occurring in shallow groundwater. Such phreatophytes include mesquite (*Prosopis* spp.), palo verde (*Cercidium* sp.), salt cedar (*Tamarix ramosissima* Ledeb.), arrowweed (*Pluchea sericea*), and catclaw acacia, *(Acacia greggii*), which occur within upland areas near the river and in the BCW where depths to water are also within potential root zones (Figure 2). Consistent with this information, mesquite and palo verde grow in the BCW in areas with water table depths up to 50 feet bgs (Figure 3; Figure 5-3 in CH2M HILL, 2009). The shallower-rooted salt cedar (*Tamarix ramosissima* Ledeb.) is found where the depth to groundwater	

5 Sorenson, M.A. , D.R. Parker, and J. T. Trumble. 2009. Effects of pollutant accumulation by the invasive weed saltcedar (Tamarix ramosissima) on the biological control agent Diorhabda elongata (Coleoptera: Chrysomelidae) Environmental Pollution 157: 384–391.

6 Aldrich, M.V., J.L. Gardea-Torresdey, J.R. Peralta-Videa, and J.G. Parsons. 2003. Uptake and Reduction of Cr(VI) to Cr(III) by Mesquite (Prosopis spp.): Chromate-Plant Interaction in Hydroponics and Solid Media Studied Using XAS. Environ. Sci. Technol. 37, pp. 1859-1864.

7 Adriano, D.C. 2001. Trace elements in terrestrial environments: biogeochemistry, bioavailability, and risks of metals. P. 607. Springer.

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			is 4 to 32 feet bgs (or where there is surface water) (Figure 2), which is consistent with its reported maximum rooting depths of about 25 feet (Table 1). Therefore, the concentrations of COPCs in groundwater underlying the deeply-rooted plants are of interest and are evaluated further below. The maximum detected concentrations of COPCs in shallow groundwater wells collocated, or nearest, the areas where mesquite, palo verde, salt cedar, catclaw acacia, and arrowweed occur were evaluated as screening level exposure point concentrations. The maximum detected hexavalent chromium concentration in a shallow well co-located with salt cedar and arrowweed along the east side of National Trails Highway is 0.148 mg/L in well PE-1 (by comparison the background UTL is 0.0318 mg/L), and the maximum molybdenum concentration in this area is 0.1 mg/L in well MW-30-30 (versus a background UTL of 0.0363 mg/L) (Figure 3). Selenium concentrations in these wells did not exceed the background UTL of 0.0103 mg/L. The maximum detection of hexavalent chromium in the BCW where the phreatophytes grow or bounding areas where they grow (see MW-41S, MW-13, MW-11 on Figure 3) is 1.71 mg/L. The maximum selenium concentration was 0.0136 mg/L at MW-11, slightly greater than the background UTL (0.0103 mg/L). The maximum molybdenum concentration (0.035 mg/L) in this area did not exceed the background UTL. The maximum COPC concentrations in groundwater described above are not associated with phytotoxicity, and therefore, effects would not be predicted in the study area. The maximum hexavalent chromium concentration in the BCW (within or bounding the area occupied by phreatophyes) is below levels believed to be toxic to phreatophytic plants such as salt cedar and mesquite. A no observable adverse effects concentration (NOAEC) of 2 mg/L for hexavalent chromium was reported in Sorenson et al. (2009[5]) for salt cedar. Mesquite (*Prosopis* spp.) tolerates hexavalent chromium in solutions of up to 125 mg/L when grown in agar and 80 mg/L when grown hydroponically (Aldrich et al., 2003[6]) indicating a hexavalent chromium NOAEC for mesquite of 80 mg/L. Hexavalent chromium concentrations in shallow groundwater in the upland east of National Trails Highway are at least an order of magnitude lower than those observed in the BCW at MW-11; therefore, phytotoxicity due to hexavalent chromium would not be predicted in either area. Similarly, the maximum concentrations for selenium are below the NOAEC of 2 mg/L reported for salt cedar in Sorenson et al. (2009). Molybdenum concentrations are orders of magnitude below the lowest observable adverse effects concentration (LOAEC) of 96 mg/L reported for the molybdenum-sensitive species such as bush bean (Adriano, 2001[7]). Assuming a factor of 10 reduction in concentration to extrapolate from the LOAEC to a NOAEC for molybdenum, the maximum groundwater concentration (0.1 mg/L) is still well below the NOAEC (9.6 mg/L). Therefore, the exposure pathway from chemically affected groundwater to phreatophytes is insignificant because maximum concentrations in shallow groundwater underlying these plant communities are very low relative to concentrations known to be phytotoxic.	

RESPONSE TO COMMENTS

Comments on the February 2009 Draft *Groundwater Human Health and Ecological Risk Assessment*
Pacific Gas and Electric, Topock Compressor Station, Needles, California

Note: Most references cited in responses can be found in the reference list of the GWRA. Those not provided in the GWRA are either footnoted or sufficiently described in text.

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HERD-SRS GC Intro		In general, the approach taken in evaluating cancer risks and non-cancer hazards (in individual wells) to potential future receptors using groundwater (impacted by activities at SWMU1/AOC1 and SWMU2) as a potable source is acceptable to HERD. Standard methodologies and default exposure assumptions recommended by the USEPA and California EPA were used to estimate risks/hazards to potential future residents. However, as discussed below (comments # 9, 10 and 11), HERD does not recommend the use of site-wide averaging of contaminant concentrations or the sensitivity analysis as a means for eliminating chemicals of potential concern (COPC). For estimating non- cancer hazards resulting from exposures to molybdenum in groundwater, HERD recommends using USEPA's existing oral reference dose (RfDo) for the metal, rather than the tolerable upper intake level (UL) developed by the Institute of Medicine (IOM). Finally, HERD recommends that COPCs in groundwater should be remediated to levels where the cumulative cancer risks and non-cancer hazards for each individual well, meets risk management goals (comment # 12).	See responses to comments HERD-SRS GC7, HERD-SRS GC 9, HERD-SRS GC 10, and HERD-SRS GC 11 below.	
HERD-SRS GC1		Title of report: Please modify the title of the report as follows: "Human and Ecological Risk Assessment of Groundwater Impacted by Activities at SWMU1/AOC1 and SWMU2, PG&E Topock Facility, Needles, California". The current title of the report implies that the risk assessment pertains to groundwater located beneath the entire area, regardless of source of contamination.	We concur with the recommended change in the title. Although the risk assessment presents estimated risks and noncancer hazards for chemicals detected in groundwater anywhere across the site, including chemicals that are determined to not be associated with releases from SWMU1 /AOC 1 and SWMU 2, the chemicals of concern (COCs) that get carried forward to the Corrective Measures Study/Feasibility Study (CMS/FS) being prepared for SWMU 1/AOC 1 are: 1) those constituents that are determined to be present in site groundwater at levels of potential concern to future hypothetical residential groundwater users, and 2) likely associated with groundwater at SWMU 1/AOC 1.	3
HERD-SRS GC2		Chemicals of Potential Concern (COPC) selection process: HERD defers to DTSC geologist/project manager for issues regarding the COPC selection process for groundwater impacted by activities at SWMU1/AOC1 and SWMU2. Communications with DTSC management indicates that COPCs in groundwater have already been selected for this site, based on comparisons with appropriate background data for the region. Details of these analyses can be found in the RFI/RI Volume 2 document. Based on this evaluation, the following chemicals were selected (and approved by DTSC) as COPCs in groundwater affected by activities at SWMU1/AOC1 and SWMU2: hexavalent chromium, molybdenum, nitrate, and selenium. As such, HERD evaluated only those chemicals that were determined to be COPCs in site groundwater, for cancer risks and non-cancer hazards to potential future residents. It should be noted here that the groundwater risk assessment will be revisited if ongoing monitoring or investigation (e.g., soil sampling results) indicate that additional COPCs may be present in site groundwater. As noted in the current report, the groundwater risk assessment (GWRA) was conducted prior to completion of contaminant delineation in site soils.	Comment noted. No response necessary.	No change
HERD-SRS GC3		Hexavalent chromium risk assessment: HERD notes that PG&E may be required to revise the risk assessment portion for hexavalent chromium, should it be reclassified (in the future) as an oral carcinogen	Comment noted about the potential reclassification of hexavalent chromium as an oral carcinogen. The GWRA acknowledges this uncertainty in Section 9.5. We want to clarify, however, that the GWRA does	No change

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		by either the USEPA or California EPA. Recent studies by the National Toxicology Program (NTP) of the U.S. Department of Health and Human Services, reveal that hexavalent chromium can cause cancer in laboratory animals at multiple sites when administered in drinking water (http://ntp.niehs.nih.gov/index.cfm?objectid=EIC04561-F1F6-975E-7B21E8B231BAB44F). This may affect groundwater remediation goals for the site. Currently, PG&E is proposing to remediate hexavalent chromium to the California Maximum Contaminant Level (MCL) for total chromium, which is 50 ug/L.	not make statements about proposing to cleanup to the California MCL for total chromium of 50 µg/l. The selection of the ultimate cleanup goal will be determined in the CMS/FS.	
HERD-SRS GC4		Cleanup goal for hexavalent chromium: HERD does not recommend using the MCL for total chromium (50 ug/L) as the groundwater cleanup goal for hexavalent chromium, instead of the calculated risk-based value (46 ug/L). Although the values are similar, the approach of using an ARAR for total chromium, in place of the calculated risk-based cleanup goal is not an acceptable procedure. The GWRA states that "as an ARAR exists for hexavalent chromium (i.e., the California MCL of 50 ug/L for total chromium), the ARAR will be used in preference over the risk-based criteria as the applicable drinking water criteria in the upcoming CMSIFS process". HERD also notes that the MCL of 50 ug/L applies to total chromium, and should not be used interchangeably with hexavalent chromium.	The GWRA will be revised to clarify that the risk assessment does not determine the ultimate level of remediation that needs to occur at the site. Discussions about the remedial action objectives, and decisions regarding the final remedial goals will be determined in the CMS/FS. Section 8 of the GWRA will present both the legally enforceable drinking water criteria (MCLs), and the risk-based criteria for all COCs, and will clarify that this range of potential remedial goals may be considered in the CMS/FS.	3
HERD-SRS GC5		Selenium: Review of groundwater data indicate that selenium concentrations are significantly elevated above background concentrations (1 0.3 ug/L) in one (TW-1) out of 76 wells. TW-1 is located within the PG&E property. According to DTSC project geologist, elevated levels of selenium track with fluctuations in hexavalent chromium within this well, and thus may be related to releases at the site (see March 4,2009, memorandum titled "Responses to PG&E February 18,2009 Comments Regarding the December 2008 RFI/RI Volume 2 Addendum Report, PG&E Topock Compressor Station, Needles, California"). Based on non-cancer hazard estimates, selenium alone exceeds a non-cancer hazard quotient of 1 (HQ = 2.0) at TW-1, and therefore contributes significantly to unacceptable cumulative non-cancer hazard for the well, and subsequently for the site. According to the report, site-wide averaging of selenium concentrations for "in-plume" and "out-of-plume" wells will result is non-cancer hazards below 1 (see page 7-18). As discussed in comment # 9, site-wide averaging of data will dilute out localized hot-spots of contamination (e.g., TW-1), and result in underestimation of risks/hazards to potential future receptors. For example, combining the elevated levels of selenium within TW-1, with results from the other 75 wells, artificially lowers the exposure point concentrations (EPC) and therefore the non-cancer hazard associated with selenium within this particular area. Although the groundwater within the PG&E property is not currently being used as a potable source, it is designated for beneficial use and could be implemented for such purposes in the future.	The current GWRA concludes that selenium is not likely to pose adverse health effects to hypothetical future groundwater users because there is only one well, across the entire site, where selenium exceeds the hazard index (HI) of 1 (with an HI of 2.0). The in-plume and out-of-plume discussions in the risk assessment do not affect the ultimate recommendation in the GWRA that selenium is not a significant risk issue; the information about in-plume and out-of-plume concentrations is merely an additional line of evidence presented to help provide context to the overall significance of selenium. Nonetheless, as directed by DTSC and DOI, the text of the GWRA will be revised to indicate that they consider any individual well with an HI> 1 to be of potential concern, and selenium will be retained as a COC for evaluation in the CMS/FS.	1

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MWD	Metropolitan Water District (submitted by Bart Koch)

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HERD-SRS GC6		Nitrate: As demonstrated in the report, non-cancer hazards resulting from potential future exposures to nitrates in groundwater exceeds an HQ of 1 in several wells, and therefore contributes significantly to unacceptable hazards to potential future residents at the site, who may be exposed to groundwater originating from these individual wells. As discussed in comment # 9, site-wide averaging of groundwater data from all wells on-site will dilute out hot-spots of contamination and lead to underestimation of non-cancer hazards. Similarly, when estimating EPCs, replacing maximum detected concentrations (in wells with fewer than eight samples, or greater than five non-detects), with average concentrations may result in underestimation of non-cancer hazards from nitrates.	The site-wide averaging is not used in the GWRA as a means of dismissing nitrate. Nitrate was dismissed in the GWRA because at the time it was not believed to be related to releases from SWMU 1/AOC 1. The DTSC, in their comments on the RFI/RI Volume 2 Addendum (CH2M HILL, 2008a), requested that nitrate be a COPC; therefore, the GWRA will be revised consistent with DTSC's direction. The final GWRA will recommend that nitrate be retained as a COC for evaluation in the CMS/FS.	1
HERD-SRS GC7		Molybdenum non-cancer hazard estimates: HERD does not concur with the approach taken in evaluating non-cancer hazards associated with molybdenum in site groundwater. In the GWRA, revised non-cancer hazards for molybdenum were estimated where USEPA's existing oral reference dose (RfDo) for molybdenum (0.005 mg/kg/d) was replaced with Institute of Medicine's (10M) tolerable upper intake levels (UL), for the metal (0.03 mg/kg/d). The GWRA states that the RfDo for molybdenum listed on USEPA's website" has serious flaws", and therefore should not be used in the risk assessment. HERD does not recommend using toxicity factors that have not been officially peer-review and accepted by the appropriate regulatory agencies. The hierarchy for source of toxicity values is as follows: California EPA's Office of Environmental Health Hazard Assessment (OEHHA), USEPA's Integrated Risk Information System (IRIS), USEPA's Provisional Peer-Reviewed Toxicity Values (PPRTV), USEPA's Health Effects Assessment Summary Tables (HEAST) and Centers for Disease Control and Prevention (CDC)'s Agency for Toxic Substances and Disease Registry (ATSDR). Based on this hierarchy, USEPA's current RfDo for molybdenum (0.005 mg/kg/day) should be used in estimating non-cancer hazards to populations who may use the groundwater as a potable source. The objective of having a hierarchy for toxicity values is that a consistent approach for risk assessments is followed for all sites. As an example, although more recent data suggests that hexavalent chromium is a carcinogen via the oral route of exposure (NTP, 2007), the GWRA does not incorporate this information into the current assessment, since neither the California EPA nor the USEPA have officially adopted these values (see comment #3). In the current report, hexavalent chromium was only evaluated as a non-carcinogen.	The GWRA presents two approaches to evaluation of the non-cancer toxicity of molybdenum. The first uses the USEPA IRIS oral reference dose (RfDo) of 0.005 mg/kg/day. Use of the IRIS RfDo follows the DTSC hierarchy for selection of toxicity value. Per DTSC's request, the GWRA will be revised to present conclusions for molybdenum as a COC based solely on this evaluation, and the main text of the GWRA will remove the discussions related to the essential nutrient evaluation. However, the alternate evaluation based on consideration of molybdenum as an essential nutrient will be retained to provide perspective for risk management decisions to be made in the CMS/FS. The alternative evaluation is presented in Appendix M, and will be modified to include an acknowledgement that the appendix is not being approved by DTSC but is being presented for additional information and context. Evaluation of molybdenum as an essential nutrient was conducted and presented for the following reasons: 1) The well-by-well evaluation in the GWRA indicated the molybdenum was a potential health concern for some wells (i.e., HI > 1). 2) *Framework for Metals Risk Assessment* (FMRA) *g*uidance (USEPA, 2007b) advises consideration of essential nutrient status for metals, balancing both beneficial and toxicity characteristics in the approach for human health risk assessment (see pages 1-10, 2-15, 4-15, and 4-16 of that document). 3) The government resource publication for essential nutrient standards *Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicone, Vanadium, and Zinc* (DRI) (IOM, 2001) challenges the validity of the 1993 IRIS RfDo for molybdenum, and presents an alternate upper bound safe consumption level, the tolerable upper intake level (UL).	1

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			4) USEPA staff serving as the compound manager for molybdenum toxicity evaluations was consulted directly to determine that agency's view of using the IRIS RfDo for molybdenum versus the UL for hazard estimates. USEPA's advice was that the RfDo listed in IRIS is indeed flawed as indicated in the IOM document, and that the UL provides a better indication of potential health concerns for molybdenum hazard (Donohue, personal communication 2009). In accordance with the FMRA (USEPA, 2007) "Essentiality this should be viewed as part of the overall dose-response relationship for those metals shown to be essential, and the shape of this relationship can vary among organisms. For a given population, 'reference doses' designed to protect from toxicity of excesses should not be set below doses identified as essential. Essential doses are typically life stage and gender specific." See pages 1-10 and 4-16 of that document. In accordance with FMRA, consideration of essential intake requirements for various age ranges (and both genders), dietary intake for molybdenum, and toxicity responses were all factors included in the alternate evaluation for molybdenum presented in Appendix M of the GWRA. The FMRA also cites the DRI as the source for essential nutrient information (see page 4-17) and describes the UL found in the DRI document as follows: "They also developed a tolerable upper intake level (UL), which is the highest level of daily nutrient intake that is likely to pose no risk of adverse health effects to almost all individuals in the general population. The UL is based on a risk assessment model similar to that used by EPA to set the RfDs and is intended to protect the population from adverse health effects resulting from excess exposure to a compound." ARCADIS' review of the DRI chapter for molybdenum (IOM, 2001) revealed that IOM deemed the IRIS 1993 RfDo to be flawed, and that the UL was recommended for use in risk assessment hazard evaluation for this essential nutrient. It is notable that safe levels of intake for molybdenum cover a broad range, the low end being the recommended daily allowance (RDA) of 34 µg/day and the high end being the UL of 2,000 µg/day. PG&E agrees that adequate peer review and acceptance by appropriate regulatory agencies of toxicity values is a preferred approach. Before presenting the alternate evaluation of molybdenum in the GWRA, PGE contacted USEPA Headquarters and spoke to the molybdenum compound manager for IRIS. Dr. Joyce Donohue confirmed that the IRIS RfD is outdated and that the UL presented in the DRI document (IOM, 2001) is the more scientifically valid and appropriate value for hazard evaluation of molybdenum for oral intake such as drinking water (Donohue, personal communications February 2009). In a subsequent conversation (Donohue personal communication, April 2009) she pointed out that the 1993 IRIS RfDo was only peer reviewed internally in the agency (consistent with requirements at that time). However, the peer review requirements for IRIS have been updated since then and are consistent with the peer review process conducted for the IOM DRI publication, which underwent both internal agency peer review and external peer review. Dr. Donohue is available to speak directly with DTSC toxicologists	

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			to discuss the use of the molybdenum UL versus the IRIS RfDo for hazard evaluation and the toxicity of molybdenum. She can be contacted in her office in Washington D.C via email (Donohue.Joyce@epamail.epa.gov) or by phone at 202-566-1098. In addition to molybdenum, selenium is also an essential nutrient. The revised GWRA will include both molybdenum and selenium as COCs. To be consistent with current guidance for addressing metals risk assessment for essential nutrients (USEPA, 2007), both molybdenum and selenium will be evaluated for toxicity considering both the RfD as indicated in IRIS and information on essentiality as indicated by the IOM. This alternate evaluation was presented in the draft GWRA for molybdenum. A section will be added to the appendix containing the information on molybdenum to include a similar evaluation for selenium for consideration in risk management decisions. ARCADIS is not aware of a peer reviewed value as being available for hexavalent chromium as an oral carcinogen, and thus did not include this in the GWRA, as it would be speculative at this point. However, the GWRA does acknowledge that OEHHA is likely going to be publishing an oral cancer slope factor for hexavalent chromium at some point in the future (see Section 9.5 of the GWRA). Further, the USEPA IRIS website shows tracking for the development of the fully peer reviewed hexavalent chromium assessment as projected to be completed in late 2012. At such time as a peer reviewed value is available, as is the case for any COPC, it will be considered in the risk assessment and associated risk management decisions.	
HERD-SRS GC8		Surface water evaluation: As noted in comment #I, hexavalent chromium, molybdenum, selenium and nitrate were the only COPCs (resulting from activities at SWMUIIAOCI) identified in groundwater at the site. As such, HERD evaluated only the above-mentioned COPCs, for impacts of activities at SWMU1/AOC1 and SWMU2 to the Colorado River. A review of the surface water data, collected between 1997 and 2007 and presented in Appendices B and C, indicates that the upstream and downstream concentrations of the four COPCs are similar (communications with DTSC management). Based on these results, the four identified COPCs do not appear to pose unacceptable risks/hazards to receptors who may have come in contact with the surface waters at the site, over that ten (10) year monitoring period. This does not take into consideration future conditions at the site, where release of COPCs into surface waters may occur.	Comment and concurrence with GWRA conclusions noted.	No change
HERD-SRS GC9		Well-by-well vs. site-wide risk assessment: HERD found that the human health risk assessment (HHRA) conducted on a well-by-well basis is a more appropriate approach for evaluating risks/hazards to receptors who may use the groundwater as a potable source. Each well potentially represents a separate exposure scenario, and is therefore most representative of situations where individuals may come in contact with the contaminated groundwater through use of private wells. Using site-wide averaging will result in underestimation of EPCs, since contaminants localized in one area will be diluted out during the averaging process. For example, see selenium data.	Site-wide averaging is not used as a basis for recommendations. It is just an additional line of evidence, consistent with our approach set forth in the approved RAWP, which provides the risk managers with useful information for consideration along with the CMS/FS findings.	No change

RESPONSE TO COMMENTS

Comments on the February 2009 Draft *Groundwater Human Health and Ecological Risk Assessment*
Pacific Gas and Electric, Topock Compressor Station, Needles, California

Note: Most references cited in responses can be found in the reference list of the GWRA. Those not provided in the GWRA are either footnoted or sufficiently described in text.

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HERD-SRS GC10		In-plume vs. out-of plume HHRA for COPC: HERD notes that the groundwater plume delineated at the site applies only to hexavalent chromium, and should not be used interchangeably with other COPCs. As such, estimating risks/hazards for all other groundwater COPC using "in-plume" and "out-of- plume" wells is not reasonable, and therefore unacceptable to HERD.	In-plume versus out-of-plume analysis is provided as an additional line of evidence, but it is not used to dismiss chemicals or risk issues. It is consistent with the approach set forth in the RAWP, and we recommend the analysis be presented in the document. Further, we note that releases of hexavalent chromium from SWMU 1/AOC 1 provides a reasonable and conservative tracer of the flow of groundwater from SWMU 1/AOC 1, and thus provides a footprint that would contain the area of any other chemicals that may have been transported by groundwater from SWMU 1/AOC 1. This fact was part of the rationale for proposing the "in-plume" and "out-of-plume" analysis in the RAWP.	2
HERD-SRS GC11		Sensitivity analyses: HERD does not recommend using the sensitivity analyses as a means for eliminating COPCs from the list of chemicals posing unacceptable non-cancer hazards for groundwater at the site. In the report, average concentrations were used as the EPCs in cases where maximum concentrations (in the wells with fewer than eight samples or greater than five non-detects) predicted unacceptable risks/hazards. Average concentrations are more representative of central tendency exposure (CTE), rather than reasonable maximum exposure (RME) concentrations. In the absence of an adequate number of data points, using the maximum concentration is more representative of the upper-bound risks/hazards. Another alternative to using maximum concentration as the EPC is to collect more data points through additional sampling. HERD recommends that the sensitivity analyses discussion be transferred to uncertainty assessment section (chapter 9) of the GWRA.	Currently, the sensitivity analysis is not used to eliminate any COPCs from the list of chemicals posing unacceptable noncancer hazards for groundwater at the site. We do believe, however, that the sensitivity analysis is an important part of the analysis, and that is it very important for risk managers to understand the extent to which decisions might be made by relying on one detected concentration (as an example). The sensitivity analysis is currently presented in Appendix F of the GWRA, and the major implications of the sensitivity analysis are presented in the body of the risk assessment. We recommend that the sensitivity analysis remain integrated into the GWRA, as currently presented. However, as discussed with the agencies, the text will be reviewed and revised, as appropriate, and clarified to explain that the sensitivity analysis is not used to eliminate chemicals as COPCs from the GWRA.	2
HERD-SRS GC12		Remediation goals: HERD recommends that contaminants in groundwater be remediated such that estimated cumulative cancer risks and non-cancer hazards in each individual well meet risk-management goals.	See responses to comments HERD-SRS GC 5, HERD-SRS GC6, and HERD-SRS GC 7 above.	
HERD-SRS SC1	Section 3	Page 3-12: The report did not include total chromium in the GWRA evaluation. This is acceptable to HERD, as long as the total chromium concentration detected in groundwater is approximately equivalent to the hexavalent chromium concentration in the same groundwater well. If this observation changes significantly in the future, total chromium should be evaluated separately in the GWRA.	Prior to the initiation of the GWRA, we discussed the issue of total chromium versus hexavalent chromium at length with the members of the RFI team. As stated in the Revised Final RFI/RI Volume 2, (CH2M HILL, 2009) "Dissolved total chromium (Cr[T]) is not specifically used for plume delineation because essentially all of the dissolved chromium species measured in groundwater at the Topock site by the Cr(T) analysis method is Cr(VI). For the Topock site dataset as a whole, there is no statistically significant difference between Cr(VI) and dissolved Cr(T) concentrations, as illustrated in graphical cross-plots of the RFI/RI chromium groundwater data (Appendix F4)." Based on this information, total chromium was not included in the GWRA.	3
HERD-SRS SC2	Section 7	Table 7-2: Please include a column showing cumulative non-cancer hazards for each of the wells.	This requested column exists; it is the far right hand column of the table.	No change
HERD-SRS SC3	Section 7	Table 7: Please include a table showing non-cancer hazards for a potential future adult resident.	The revised GWRA will include a table showing non-cancer hazards for a potential adult resident, as requested.	3

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HERD-SRS SC4	Section 7	Table 7-8: Please remove the word "cumulative" from the headings for the columns. These values correspond to non-cancer hazards for individual contaminants in the wells.	The use of the term "cumulative" is appropriate here, as this column is showing the number of wells where the individual chemical is a material contributor to a cumulative HI of greater than 1 (as described in Appendix K).	No change
HERD-SRS Closing		Overall, the HERD found that the risk assessment for individual wells was conducted in a manner that is acceptable to HERD. However, HERD does not concur with the use of site-wide averaging of contaminant concentrations and sensitivity analyses, in eliminating chemicals from the COPC list. Groundwater should be remediated such that the cumulative risks/hazards to potential future receptors meet risk management goals. HERD notes that the decisions made in this document are site specific and should not be construed as a policy decision applicable to other sites. If you have additional questions please feel free to contact me at (714) 484-5448 or Sroysemm@dtsc.ca.gov.	See responses to comments HERD-SRS GC7, HERD-SRS GC9, HERD-SRS GC10 and HERD-SRS GC 11 above.	No change
MWD C1		MWD does not have any comments on the Risk Assessment.	No response required.	No change
DOI GC1		The Groundwater Risk Assessment (GWRA) is generally a high quality offering that provides significant clarification of the potential human health risks associated with site groundwater contamination. The document itself is a superior quality production exhibition. The assessment and exposition is transparent and generally reproducible. On the whole, the assessment by and large complies with prevailing guidance; however, there are notable exceptions which we discuss below.	No response required.	No change
DOI SC1	ES	The format of the Executive Summary is satisfactory; however, based on our comments below, we anticipate that it will be revised.	No response required.	Changes below
DOI SC2	ES.2.2, Page ES-4, Paragraph 1, 3rd sentence	Remove the following words "sparsely vegetated, and".	The requested revision will be incorporated into the final GWRA.	3
DOI SC3	ES.2.2, Page ES-4, Paragraph 2, Last sentence	Dense monotypic stands of salt cedar do not allow any other plant growth under the canopy. Typically, arrowweed grows around the margins of salt cedar and/or around the margins of riparian areas.	The text will be revised to state: "This plant community is characterized by dense thickets of tamarisk, or salt cedar (*Tamarix* sp.), sometimes with an understory of arrowweed (*Pluchea sericea*). Salt cedar is highly successful in arid climates with saline or alkaline soils and often occurs in monotypic stands in riparian areas."	3

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DOI SC4	ES.2.3, Page ES-5, Paragraph 2, Last sentence	Remove the entire sentence.	We do not agree that the following sentence should be removed from the GWRA: "As discussed in the RAWP, although future residential use of the USBLM land is unlikely, USDOI has specifically requested an evaluation of future residential use on USBLM property". This is a factual statement, was presented in the RAWP, and is an important point to communicate. Please refer to comment DOI SC 13 for additional details.	3
DOI SC5	ES.3, Page ES-7, 3rd bullet	Do the SVOCs and TPHs analyzed for encompass all of the PAHs that were detected?	Please refer to Table 3-4b in the GWRA for a summary of all constituents sampled for and detected in site groundwater.	No change
DOI SC6	ES.4, Page ES-8, Paragraph 1, 1st sentence	Delete the word 'relevant' because this implies that pH and TDS are not important to human health or the environment. Changing the sentence to 'constituents or general chemistry parameters that are not applicable to human health or environmental risk assessments' would express your original intent without the negative connotation.	The requested revision will be incorporated into the final GWRA.	3
DOI SC7	ES.6, Page ES-11, Paragraph 2	Since soil characterization is still revealing additional constituents of potential concern, it will be necessary for PG&E to verify that those new constituents (e.g., dioxins) are not in the groundwater. We expect groundwater wells to be sampled and analyzed for dioxins.	Additional analyses of groundwater are currently underway. Nonetheless, as discussed in the RAWP, a cutoff date for the analytic data needed to be established in order to proceed with the current GWRA. As stated in both the RAWP and the GWRA, the additional groundwater monitoring data may be incorporated into the Groundwater Risk Assessment Addendum, if necessary and appropriate. We note, however, that the current GWRA is a GWRA for SWMU 1/AOC 1, and the upcoming CMS/FS describes the remedy for groundwater associated with SWMU 1/AOC 1.	No change
DOI SC8	ES.7.1, Page ES-13, Paragraph 1, 2nd sentence Section 6.1, Page 6-1, 2nd paragraph	The term 'response potency' is a redundant. Use one or the other but not both.	As requested, we will remove the term 'response' from this sentence.	3

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DOI SC9	ES.8.1, Page ES-16, Paragraph 2, 2nd sentence	The word 'estimated' in "estimated EPC" is an unnecessary qualifier. An EPC by definition on page ES-12 is 'the estimated average concentration.'. Please check and delete all occurrences of this unnecessary qualifier.	We agree that the definition, up front, of the EPC conveys that the EPC is an estimated value. However, because we believe that it is an important point that the exposure concentrations are estimated values of potential exposure, we specifically wanted to remind the reader, throughout the report, that the exposures presented in the GWRA are estimated values. For these reasons, we believe the 'estimated' qualifier is important, and we would propose to leave it in.	3
DOI SC10	ES.8.4, Page ES-18, Table	There are no superscripts for notes 3 and 4 in the table. Please add superscripts to notes 3 and 4. Categorizing frequency and magnitude of contribution is a way to break down the estimated risk so it can be explained easily. However, low, medium, and high should have been defined in the RAWP or in a Technical Memo for the human health risk assessment. The Synthesis technique summarized here was not presented in the RAWP, it does not conform to USEPA RAGS, and the information is insufficient for determining which COCs to move forward into the CMS/FS. See comments on Section 7.0.	The superscripts will be added to the table. We developed the categorization technique merely as a way to help organize like-chemicals with other like-chemicals, with the idea that it would help the reader absorb a large amount of complicated information. When preparing the RAWP, we provided the risk assessment methods consistent with Risk Assessment Guidance for Superfund (RAGS) and other applicable guidance. The categorization is not a method for estimating risk, it is merely a risk communication tool developed with the benefit of the completed risk estimates (which were not available when the RAWP was prepared), and provides perspective on relative contribution to risk useful for risk management purposes. We do not believe that the categorization provided is *inconsistent* with risk assessment guidance, although we acknowledge that it does not specifically appear as an example synthesis tool in the guidance documents. See response to comment DOI SC22 for additional discussion regarding the selection of COCs.	3
DOI SC11	Section 2.2.2, Page 2-3, 5th sentence	Delete the sentence describing terrestrial wildlife diversity. DTSC requested you to remove it from Eco TM #3 and it does not belong here either. The sentence is not true because 1) terrestrial wildlife diversity is not low – it is a typical community for the Mojave Desert. The upland, terrace slopes of the lower Colorado River around the Topock Compressor Station very disturbed closest to the PG&E fenceline surrounding the station, but this disturbance decreases with distance from the facility. Also, the wildlife corridor outside of the TCS is not incomplete. We challenge the use of this reference from CH2M Hill (2005a) and request that it not be used again.	Please see response to comment FMIT GC2 for proposed revision to address this comment. Natural barriers such as the Chemehuevi Mountains and Colorado River do interrupt movement of some terrestrial wildlife species. The text will be revised to narrow the scope of the statement.	3
DOI SC12	Section 2.3.1, Page 2-5, 3rd paragraph	A portion of the Topock Maze occurs within the boundary of the Havasu NWR. Please adjust the text accordingly.	The revised GWRA will acknowledge the presence of the Topock Maze.	3

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MWD	Metropolitan Water District (submitted by Bart Koch)

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DOI SC13	Section 2.3.2	Discusses anticipated future use of the site and adjacent environs and seems to reach a conclusion that any future use of groundwater is highly improbable. The assessment acknowledges a potential use of groundwater north of I-40 as plausible. This description evolves into a theme that is repeated though-out the assessment and which may to lead some readers to downplay and perhaps misunderstand the significance of site related constituents impacting groundwater quality. As discussed below, DOI request further evaluation on this subject and requests that the thematic expression be modified accordingly. The conclusions regarding potential for future groundwater use are reached based on an incomplete consideration of factors that contribute a groundwater useability assessment. Aspects that the reader needs to be assured have been comprehensively researched and well thought-out include, but are not limited to: 1) the existence of legal prohibitions on groundwater use (e.g., covenants, deed restrictions), 2) potential need for beneficial uses of groundwater in the future beyond direct human consumption (e.g., irrigation), 3) opportunity for groundwater use in a recreational setting (e.g., an extraction well used by campers), 4) forthcoming overall water utilization needs in light of regional growth pressures in conjunction with resource commitments and availability of the Colorado River to support those needs (e.g., implementation of Colorado River Compact in light of pending actions in upper basin states), 5) aquifer characteristics and potential future uses (e.g., is their adequate yield to supply a range of plausible uses?). Please investigate, complete, and revise this section, and ensuing sections which draw from this section, based on this examination. As a guide for this assessment, a premise embracing resource protection and renewal in the arid southwest and recognizing the potential opportunities for future population expansion and the need for valuable water resources to support that development is recommended.	We acknowledge that the topic of potential future land use is a complicated subject at the site, in part because the site consists of property under federal ownership and property that is designated as a Wildlife Refuge. The discussion regarding future potential land used was agreed upon in 2007, and the descriptions of reasonable future land use were developed based on input from the landowners (as specified in DOI 2007). Further, these future land-use descriptions presented in the GWRA were all presented in the approved RAWP. As discussed during the May 5, 2009, meeting, DOI concurs that the language presented in Section 2.3.2 should remain as currently presented in order to be consistent with previous direction from the landowner. We do note, however, that the GWRA mentions the beneficial use aspects of the groundwater in Section 5.4 of the report, and most importantly, evaluates every single groundwater monitoring well under the assumption that the groundwater is being used as a potable water source.	2
DOI SC14	Section 3.2.1, Page 3-4,	In consideration of recent findings during the East Ravine investigation, the results of groundwater analysis from the new wells in the East Ravine need to be further evaluated in the overall groundwater risk assessment.	As stated in the GWRA, information from the East Ravine, and any other relevant and pertinent groundwater data collected after the completion of the Revised Final RFI/RI Volume 2 (CH2M HILL, 2009) and Addendum (CH2M HILL, 2008a) documents and the associated GWRA, will be incorporated into a Groundwater Risk Assessment Addendum, if necessary.	2
DOI SC15	Section 3.2.1.2, Page 3-9, 3rd paragraph	Please compare the data on PAHs in the groundwater data set with the PAHs detected in the soil sampling investigation. Provide us with the names of any PAHs that were detected in surface soils but not analyzed in groundwater. It will be necessary to collect more groundwater samples to demonstrate that the dioxins and pesticides detected in soils have not migrated to the groundwater.	To address the first part of the comment, PG&E identified the polycyclic aromatic hydrocarbons (PAHs) detected in surface soil but not analyzed in groundwater. Only one PAH, 1-methylnaphthalene, was detected in surface soil but not analyzed for in groundwater. As indicated above in response to comment DOI SC14, any other relevant and pertinent groundwater data that is collected after the completion of the GWRA will be incorporated into a Groundwater Risk Assessment Addendum, if necessary.	No change
DOI SC16	Section 3.3 Data Useability	DOI is not convinced that the data set used in the GWRA has been suitably scrutinized and evaluated for useability and, in turn, whether the GWRA can be relied upon as the foundation to reach conclusions regarding its stated purposes.	Given the length of this comment, the response will be separated into sections, in accordance with the numerous topics identified in the comment.	2

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		Section 3-2 of the RAWP in essence defers data validation and useability issues to the RFI/RI Vol. 2 (Jan 2009) and RFI/RI Addendum (Dec 2008) noting that useability will be evaluated in those RFI/RI documents in accordance with four conventional risk assessment guidance's (see pp 3-14 RAWP). Section 3.3 of the GWRA basically defers back to the RAWP. This circular path leads the reader to the RFI/RI Volume 2 and its Appendix H (Feb 2009) as the principal source for data quality and useability information. We note that there is summary discussion of data quality in Section 3.3 of the GWRA; however, there is no detailed analysis and the reader is left with the impression that the GWRA took what was provided in the RFI/RI Vol. 2 and Addendum at face value. As noted below, Appendix H does not meet the expectations set forth in the RAWP. Supporting observations include: 1) Appendix H is a summary of groundwater data spanning the period 2002 – 2007. Has data collected since that time been validated and evaluated for GWRA useability (the topic is not addressed in the RFI/RI Addendum). 2) Appendix H provides only cursory information and does not conform to the risk assessment data useability guidance (i.e., those cited in the RAWP). Moreover, neither Appendix H nor the RFI/RI Vol. 2 main text addresses data useability for risk assessment purposes. In fact, neither even cites the four risk assessment data useability guidance's set forth in the RAWP. 3) None of the "data trail" documents (RFI/RI Vol. 2 [and Appendix H] or the RFI/RI Vol. 2 Addendum) speak straightforwardly to risk assessment data useability. DOI requests PG&E to prepare a risk assessment data useability matrix in tabular form that can provide the reader summary information by appropriate time or phase interval. The matrix should pull from existing data validation, quality, and useability summaries and should include all topics discussed in Section 3.3.1 through 3.3.7. Special emphasis should be placed on the following: • Analytical suites evaluated • Data validation status (percentage validated, number flagged (J R B, etc.) any pertinent validation narrative discussing useability issues. • Quantitative summary of detection limit performance noting: o Number of analysis achieving specified deletion limits	First, the project has followed regulatory guidance and procedure such that all stakeholders reached the conclusion that groundwater impacts associated with releases from SWMU 1/AOC 1 have been adequately characterized by approving the Revised final RFI/RI Volume 2 (CH2M HILL, 2009) and RFI/RI Volume 2 Addendum (CH2M HILL, 2008a). This review and acceptance was conducted so that the project could move forward to the risk assessment/remedy stage of the project. Therefore, we believe that the stakeholders had agreed that the dataset used in the GWRA has been suitably scrutinized and evaluated for usability and, in turn, that the GWRA can be relied upon as the foundation to reach conclusions regarding its stated purpose. If there is sufficient data to reach reasonable conclusions regarding the nature, extent, and magnitude of impacts associated with the historical releases (untreated releases that occurred between 1951 and 1964), and sufficient data to enter the remedy stage of the project, then it is our experience that there is more than sufficient data upon which to make reasonable risk-based conclusions. We disagree that the GWRA defers back to the RAWP with respect to data usability. It does, as agreed upon in the RAWP, refer to the RFI/RI Volume 2, as the document that is intended to describe and fulfill essential data usability criteria. The reason the data usability criteria were intended to be set forth and discussed in the RFI/RI Volume 2 is that any conclusions that the data are inadequate could lead to the corresponding conclusion that data gaps exist and more data needs to be collected. Regardless of whether data quality discussions of the RFI/RI Volume 2 were specifically organized into the 'typical' five data usability criteria, stakeholders agreed that the data was of sufficient quantity and quality to meet the fundamental data objectives of the RFI. Appendix H, referred to in this comment, was specifically prepared in response to a comment from DOI in which they were concerned that the RFI contained no discussion of the data quality objectives (DQOs) or data quality indicators (DQIs) that assure the reader that the data is of acceptable quantity and quality to support the conclusions presented. The data quality discussions, presented in Appendix H and throughout the rest of the RFI, were approved by USDOI and other stakeholders and regulators. It is PG&E's position that approval of the RFI and its data quality discussions is sufficient to move forward to the next step of the project. Further, the GWRA provided many additional evaluations with respect to risk assessment data usability (e.g., adequacy of detection limits), which support that data from the RFI is of sufficient quality to develop a risk assessment and CMS/FS. Further, where it was determined that additional data usability information, not highlighted in the RFI/RI Volume 2, would be useful to the risk assessment, this information was analyzed and presented in the GWRA (e.g., percentage of qualified data; impact of elevated detection limits). And, the overall strengths and weaknesses of the dataset for individual constituents/monitoring wells are discussed in Sections 7 and 9 of the GWRA. With respect to comments on the approved Appendix H of the RFI/RI Volume 2:	

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		o Specific analytes where detection limit problems are encountered o Number of analyses achieving detection limits relative to Risk Based Concentrations (RBCs) o Number of analysis affected by matrix effects • An explicit data quality useability statement. This objective presentation and evaluation there of will help ensure that data quality and useability has been scrutinized in accordance with expectations set forth in the RAWP and those of comparable CERCLA/RCRA projects. Moreover, the presentation and evaluation ease concerns stemming from well intended , but caveat laden general statements occasionally found in text (e.g., pp 3-21 "For these reasons, data collected over the 10-year investigation period are generally considered comparable, within the general limitations expressed during the individual data validation efforts"). Simply stated, we need to have a presentation of the information to address question such "what are the limitations, what are the data sets with limitations, and how do they affect the analysis"? Please see our comment below regarding Figure 4-1 for information related to the request.	1) The PG&E Program QAPP (CH2M HILL, 2004b) defines four types of laboratory deliverables. The data deliverable requested depends on the DQOs of the individual project. All Topock data packages associated with the groundwater investigation are requested at a level 3 or above type deliverable. As defined in the PG&E Program QAPP "Level 3 data is appropriate for investigative, confirmatory, or closure results. Critical project decisions may be made using this data." ALL (100%) of the data presented in the RFI/RI Volume 2 Addendum was validated to a level 3 as defined in Section 8.2 of Appendix D, *Quality Assurance Project Plan for Water Quality Sampling and Analysis*, of the *PG&E Topock Program Procedures Manual* (CH2M HILL, 2005). 2) The information presented in Appendix H and elsewhere in the RFI/RI Volume 2 has been specifically organized in the GWRA into the five data usability criteria presented in the RAWP. As such, although the information in the RFI wasn't specifically organized according to the five data usability sections referred to by DOI, we believe that much of the fundamental data usability information was contained in this document, and where certain additional pieces of information were needed, additional analyses were discussed and presented in the GWRA. 3) As stated in number 2 above, where the 'data trail documents' didn't speak straightforwardly to data usability (e.g., detection limits), this information was presented in the GWRA, and organized according to the five data usability criteria. The specific elements DOI has requested in item number 3 are contained in the current version of the GWRA in the sections noted below. • Analytical suites evaluated (Tables 3-4a to 3-4e present these in detail). • Data validation status (percentage validated, number flagged [J R B, etc.]) and any pertinent validation narrative discussing usability issues: o Information on the percent of the data that is J-flagged and rejected is specifically mentioned in Section 3.3.4. o Information regarding blank flags was not provided in the draft GWRA, but will be incorporated into the final GWRA. Specifically, the following information regarding blanks will be added to Section 3.3.4: "Blank flags are not used in data validation for the PG&E Program and are not found in the guidance document *Contract Laboratory National Functional Guidelines for Inorganic*	

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			Data Review (USEPA, 1999)." • Quantitative summary of detection limit performance noting: o Number of analysis achieving specified detection limits: This is discussed in Section 3.3.3 and Section 9 text/tables. o Specific analytes where detection limit problems are encountered: This is discussed in Section 3.3.3.1 and Section 9 text/tables. o Number of analyses achieving detection limits relative to Risk Based Concentrations (RBCs): This is discussed in Section 3.3.3.2 and Section 9 text/tables. o Number of analysis affected by matrix effects: The GWRA doesn't specifically mention the number of analyses affected by matrix effects. However, as matrix effects act to raise reporting limits, Sections 9.2.3 and 9.4.2.1 specifically mention the impacts of elevated detection limits on the risk assessment. • An explicit data quality usability statement was not contained in the RFI/RI. Nonetheless, the fundamental elements that contribute to the development of a dataset that is usable for ascertaining that characterization is complete (i.e., the conclusion of the approved RFI/RI Volume 2) and that the project can move forward to the risk assessment and remedy selection stage of the project, are contained in both the RFI/RI Volume 2 and the GWRA. Based on the above, we believe that the data quality and usability have been scrutinized in accordance with expectations set forth in the RAWP and those of comparable CERCLA/RCRA projects. Section 9 presents a thorough discussion of the key uncertainties associated with each step of the risk assessment, including the implications of the dataset, its limitations, and the ultimate impact on the analysis and conclusions. As discussed with DOI, the various requested data usability elements requested by DOI, that are currently presented in the GWRA in the sections identified above, are attached as a Data Usability Table (Table 2), and will be presented as an appendix to the revised GWRA.	
DOI SC17	Figure 4-1	DOI is concerned with sole reliance on the logic in Figure 4-1 and the goal of erring on the side of	The COPC selection process, outlined in Figure 4-1 and related text in the GWRA is robust, entirely	2

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	and related text.	protectiveness. The concern is that when an individual well ICOPC maximum concentration exceeds the UTL, the ICOPC is subjected to further statistical tests which, in some cases, can lead to an ICOPC being deleted from the analysis when, possibly it should be retained for reasons beyond the rationale illustrated in Figure 4-1. A case in point is Cr VI in MW 23 where the following is observed: • Cmax = 1.02 mg/l (1,020 µg/l) which exceeds the Background UTL of 0.0318 mg/L (by a factor of 32) (Table 4-1a). • Following the logic and statistical tests, Cr VI at MW 23 is omitted from the GWRA because it passes the Gehan test (Table 4-1b). • On further inspection of MW 23 results (See pages 23 and 24 of 96 in Table A-1a in Appendix A) however, it is apparent that there are considerations other than the mathematic surety and logic of the approach that can affect the screening and which should be understood. Consider: o Prior to June 12, 2004, Cr VI was consistently reported as 10u (non detect at 10 µg/l. Note there are 18 consecutive 10u reports. o After June 12, 2004, a pattern of Cr VI detections begins to emerge, some detections less to 10 µg/l (perhaps there was a change in sampling or analysis resulting in lower detection limits?). o The emerging pattern seems to suggest: a) presences of Cr VI in a well supposedly considered un affected prior to 2004 and, b) increasing concentrations. o The pattern continues though the cut off date of May 6, 2008. DOI entered the MW 23 Cr VI data into ProUCL 4 (Did PG&E exclude the 05/06/2008 Field Dup of 23.2 µg/l J?), computed summary statistics*(see table at end of document) and got the following results. These results indicate: • The mean (including all 36 entries with 14 non detections treated by ProUCL's routines) concentration just exceeds the background UTL (31.8 µg/l) as do two of non parametric estimates of the UCL95% OTM. • The mean of "just the 14 detections" – all of which occur after June 12, 2004; however, is 83.6 µg/l which is more that double the "all entries" mean and, accordingly about 2.5 times the background UTL.	consistent with risk assessment guidance, standard practice, and the approved RAWP. In general, this approach errs on the conservative side. The example that DOI points out, the exclusion of hexavalent chromium from the MW-23 risk evaluation is a good example of the situation where an alternative approach (i.e., the inclusion of hexavalent chromium in the quantitative risk assessment for MW-23) would not result in any material changes in the project. The risk assessment culminates with the identification of the COCs to be carried forward to the CMS/FS; this conclusion is unchanged by MW-23 (i.e., regardless of MW-23, hexavalent chromium is very clearly a COC that gets carried forward to the remedy stage of the project). It is the role of the CMS/FS rather than the GWRA to determine how and where to cleanup the hexavalent chromium. There are two principal points/concerns raised in this comment, both of which question the overall 'validity' of the process used to identify the chemicals to be included in the quantitative risk assessment. The first concern pertains to those situations in which the maximum detection of a chemical in a well was greater than the background UTL, but the additional statistical tests (i.e., the Gehan and the Quantile test) support that the presence of the chemical is likely within background concentrations, and thus the chemical was not included, at that well, in the quantitative risk assessment. The second concern has to do with the use of the background UTLs, as set forth in the approved Groundwater Background Study (CH2M HILL, 2008c), as the initial point of comparison to determine whether a chemical is likely present above background concentrations. Each of these concerns is discussed further below. **Concern 1: Use of statistical population comparison tests (i.e., Gehan and Quantile test) to conclude that a chemical is present within background concentrations (and thus not included in the risk assessment at that well).** Discussion of MW-23: The comment identifies one well, well MW-23, as an example of situations where the maximum detected concentration is greater than the background UTL (for hexavalent chromium), but where hexavalent chromium was screened from MW-23 because it passed both populations tests: Gehan and Quantile. The Quantile test compares the upper tail of the site and background datasets, which includes the single high detection of 1.02 mg/L. Because the Quantile test supports the conclusion that the population is below background, it seems likely that the single high detection of 1.02 mg/L is an outlier. To check the validity of this conclusion, the outlier test was run in ProUCL to assess the likelihood that this single elevated concentration is an outlier. According to the Rosner's Outlier Test, there is 99% likelihood that this result is an outlier. While ProUCL recommends conducting statistical analyses both with and without potential outliers, we have conservatively conducted our statistical analysis with the inclusion of outliers. In fact, the next highest sample of hexavalent chromium from MW-23 is 23.2 µg/L, a level that is actually below the background UTL and the RBC of 46 µg/L, calculated and presented in the	

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		• Both UCL95% OTMs both exceed the Cal Groundwater Standard of 50 µg/l. • Both UCL95% OTMs also exceed the Risk-Based Concentration (RBC) of 46 µg/l. This summary would indicate that we are 95% confident that the mean Cr VI concentration at MW 23 exceeds: the background UTL, the Cal Groundwater Standard, and the Site-Specific RBC. Based on these comparisons, it appears that, although it was screened out by through Figure 4-1, Cr VI in MW 23 poses a significant health risk. On this basis, please add MW 23 back into the GWRA. This illustration points to other issues discussed below. This illustration is concerning because there are other entries in Table 4-1b where an ICOPC with a maximum concentration exceeding the background UTL is deleted via the follow on statistical tests. Our concern deals not only with the possibility of missing a health risk, but also with other issues stemming from sole reliance on purely numerical techniques. Issues that might have been examined and considered in the Cr VI / MW 23 example includes, but are not limited to: • Is the detection that dominates this assessment (1,020 µg/l) valid? (See DOI comment regarding Data Usability.) • Why wasn't the trend of emerging Cr VI and increasing detections observed and factored into the analysis? (Reports provided to the risk assessors in the data useability assessment should have noted this.) • Are the early year data (before 2004) comparable to the later year's data? (Again, see our comment regarding Data Usability.) • In assessing future risks in a dynamic situation, how should time trends be considered? • Is the more recent data actually more indicative of what could be expected in the future at MW 23? • What is the extent of this type of phenomena throughout the 10 year groundwater surveillance history and subsequently the GWRA? Please note we are not criticizing PG&E's use of the screening method; the technique is very powerful screening tool that generates an abundance of useful information in a cost-effective manner. However, as illustrated, when used in isolation, it is not without potential shortcomings.	GWRA. Note that the validity of this elevated result was assessed in Appendix 2 of CH2M HILL's *Groundwater and Surface Water Monitoring Report, Second Quarter 2007*. Because MW-23 is a bedrock monitoring well, it is "a low-yield well that typically pumps dry during purging and recovers at a very slow rate." Typically, sampling occurred the day following purging; however, during this sampling event, groundwater recovery was more rapid allowing the sample to be collected soon after purging. CH2M HILL conducted a focused test in June to July 2007 and was not able to recreate the elevated results under various purging trials. The origin of the anomalous high result was not determined, so the sample result was not rejected and has been included in the dataset. We concur with DOI that there does appear to be an increasing trend in hexavalent chromium concentrations in MW-23 since 2003. However, evaluation of the data at MW-23 indicates that the maximum detection of 1.02 mg/L does not appear to be reflective of the overall trend, and as described above, the next highest concentration of hexavalent chromium is 23.2 µg/L. Most importantly, the treatment of hexavalent chromium in MW-23 in the GWRA does not represent an example of "unseen and unintended faults." The conclusion of the risk assessment is that hexavalent chromium is a COC, and the CMS/FS will address how and where the remediation will occur. None of this is changed by the fact that MW-23 was not included in the quantitative risk assessment. And, as the stakeholders are aware, the elevated concentrations of hexavalent chromium around MW-23 are being further explored through the additional data collection efforts occurring around the East Ravine. General Discussion of Approach We reiterate that we used a conservative screening approach whereby well/chemical pairs were screened out only when both the median population test (Mann-Whitney or Gehan) and the quantile test (comparing the upper tails) agreed that site concentrations are less than or equal to background concentrations. Of 440 well/chemical pairs that had a maximum detection greater than the associated UTL, 192 (44 percent) well/chemical pairs were further analyzed by population tests. Only 19 (4.3 percent) well/chemical pairs were screened out of the risk assessment. In order to further evaluate the concern posed by DOI, the 19 well/chemical pairs that were screened out of the risk assessment because of the statistical population comparison tests were examined in further detail. The summary statistics for each of the chemical/wells pairs, including number of detections, number of samples greater than the background UTL, and the 95% upper confidence limit (UCL) are all presented in the attached Table 3. Also attached, as Table 4, are the results of each of the individual sampling events for these chemicals, to facilitate the reviewers more detailed evaluation of the data. As indicated in Table 3 (attached), of the 19 well/chemical pairs screened out of the risk assessment,	

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<table>
<tr><th>Comment Number</th><th>Section/ Page</th><th>Comment</th><th>Response</th><th>Comment Category</th></tr>
<tr><td></td><td></td><td>This concern with confidence in the screening process is exacerbated when it is recognized the background UTL95%95% used as the initial screening tool is not a highly conservative screening metric. As indicated in USEPA Guidance, the UTL is actually an upper end of the range yardstick often used to identify outliers (Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites). When set at the 95% 95% gauging point, an IPCOC is flagged for consideration only if its maximum concentration is a high end outlier. There could be numerous IPCOC detections just below the gauging level; well outside the background distribution's central tendency range and the IPCOC dismissed from the analysis. For reference, at the Department of Energy's Rocky Flats Environmental Technology Site, the UTL95%95% was rejected by stakeholders because it was not a conservative tool. Please note that this comparison technique does not recognize the statistical issue of multiple comparison which further underscores the need to use it with some caution and consideration of other factors, particularly involving close calls.

DOI requires that PG&E consider these issues and develop a management system that will ensure that COPC screening processes such as those set forth in 4-1, 4-2, 4-3, and 4-4 do not contain unseen and un intended faults such as that describe above and, importantly, that the GWRA results are trued with RI/RFI observations and that the data used in the screening process has been adequately examined to ensure its useability for the GWRA.

<table>
<tr><td colspan="2">*Computed Summary Statistics Table</td></tr>
<tr><td><u>Parameter/Statistic</u></td><td><u>Result</u></td></tr>
<tr><td>Distribution</td><td>Data do not follow discernable distribution</td></tr>
<tr><td>Mean (of all 36 entries)</td><td>34.6 µg/l</td></tr>
<tr><td>Mean (of 14 detections)</td><td>83.8 µg/l</td></tr>
<tr><td>UCL 95 OTM (Chebyshev)</td><td>160.2 µg/l</td></tr>
<tr><td>UCL 95 OTM (ProUCL "Suggested)</td><td>94.2 µg/l</td></tr>
<tr><td colspan="2">These results basically match PG&E's.</td></tr>
</table></td><td>only four (0.9 percent) have a calculated 95%UCL above the associated background UTL. These four well/chemical pairs are hexavalent chromium in MW-23, vanadium in MW-34-80, vanadium in MW-37D, and zinc in OW-5M. Each of these four chemical/well pairs has a single distinct elevated concentration, with ratios of the highest to second highest observed concentration of 44, 16, 10, and 7.5, respectively. The 95%UCLs are dominated by the single elevated concentration. The outlier test using ProUCL was run for these four chemical/well pairs. In every case, ProUCL reports that the single elevated concentration is 99% likely to be an outlier.

The zinc outlier of 278 µg/L was "J" flagged as estimated because zinc was not detected in the associated field duplicate with an RL of 10 µg/L (see CH2M HILL's *Groundwater and Surface Water Monitoring Report, Fourth Quarter 2007*.). As indicated in the GWRA, all data containing "J" flags were included in the GWRA. We note that not only is zinc not a COPC associated with SWMU 1/AOC 1, the maximum detection of zinc, 0.278 mg/L, is more than an order of magnitude below the RBC of 4.7 mg/L (as presented in Appendix N). Accordingly, we do not believe that the one high hit of zinc, at this one well, affects any of the conclusions established in the GWRA.

The RFI/RI Volume 2 discusses the high vanadium concentrations, and states that they are likely due to laboratory analytical issues. "Of the 14 [vanadium] samples in plume or plume flowpath wells that have exceeded UTL, ten were from a single sampling event in March 2005. Nine of these ten were reported as anomalous at the time (CH2M HILL, 2005a)[8] and re-sampling in June 2005 showed vanadium values back in normal range (below UTL), suggesting that laboratory analytical issues were the source of the elevated concentrations." (CH2M Hill, RFI/RI Volume 2, 2009) Both outlier vanadium samples are from the single sampling event in March 2005 mentioned above. Accordingly, these two potential vanadium samples were not overlooked, do not represent an example of unseen and unintended faults, and were deliberately and conservatively included in the GWRA dataset because they were not rejected from the database during the data quality assessment process (which occurs per the approved QAPP). As vanadium is not a COPC that is associated with potential releases from SWMU 1/AOC 1, additional focus on these two particular wells was not deemed necessary or relevant to the overall conclusions of the GWRA or the CMS/FS.

As requested, the temporal trends of vanadium in MW-34-80, vanadium in MW-37D and zinc in OW-5M were evaluated. There does not appear to be increasing concentrations over time in any of these chemical/well pairs.

In summary, based on this analysis, we believe that the approach documented in the GWRA is sufficiently conservative, has appropriately excluded wells based on a conservative comparison to background populations, and is not resulting in unseen and unintended faults that in any manner that affect the overall conclusions of the GWRA. We propose to include the above analysis and discussion in</td><td></td></tr>
</table>

8 CH2M Hill. 2005a. Technical Memorandum: Response to DTSC October 11, 2005 Comment on PG&E Topock Groundwater Title 22 Metals Sampling. November 11.

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			the uncertainty section of the GWRA. **Concern 2: Use of the background UTLs as the initial point of comparison to determine whether a chemical is likely present above background concentrations.** As indicated in the comment, if the maximum concentration of a chemical at a given well is below the background UTL, as established in the Groundwater Background Study (CH2M HILL, 2008c), the chemical is determined to be within background concentrations and thus is not evaluated further. This approach was very specifically and clearly set forth in the RAWP, which was approved by all stakeholders, and is entirely consistent with CalEPA guidance (CalEPA, 1997[9]). Based on our conference call with DOI and DTSC on April 20, 2009, we understand that DOI will not require further evaluation, analysis, or discussion of this approach.	
DOI SC18	Section 4.1.1, Page 4-2 to 4-4.	Please discuss how PG&E arrived at using the Form 1 Hypothesis Test for the background comparison tests and evaluate GWRA implications for its use. In ProUCL the selection of Form 1 (Ho: Site <= Background) or Form 2 (Ho: Site => Background) shifts the power of the test. For close calls and other reasons discussed below (i.e., data sets that are similar) Form 2 is the more conservative test. That is, Form 2 of the test is more likely to result in including rather than rejecting an ICOPC; from a protectiveness perspective, Form 2 is preferred. One USEPA Guidance (Multi-Agency Radiation Survey and Site Investigation Manual), recommends the Form 2 hypotheses for this reason. USEPA's Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites does not make a policy recommendation on the issue; however, the guidance does identify two serious problems with the Form 1 test; one dealing with lack of power to detect small difference when larger data sets are involved (as could be the case with the Site wide comparisons) and the second dealing with a lack of power when situations where insufficient data are available (as might be the case when the well-by-well comparison are made). USEPA Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites urges users to give careful consideration to selection of the form of the hypothesis test.	The use of Form 1 of the null hypothesis is based on and consistent with DTSC's guidance (Cal/EPA, 1997[9]) Moreover, the USEPA MARSSIM recommends Form 2 of the null hypothesis in cases where the primary goal is to evaluate compliance with a radiological release criterion. However, this guidance recommends Form 1 of the null hypothesis in cases where the primary goal is to evaluate whether a radiological release is distinguishable from background. The latter case is much more closely related to our use of the null hypothesis: to evaluate if chemical concentrations in groundwater are distinguishable from background concentrations (USEPA, 2000; Appendix D, page 17). Considering USEPA's background guidance, we believe the reviewer has misinterpreted the first concern regarding Form 1 of the hypothesis. The guidance states "If the site exceeds background by only a small amount, there is a very high probability that the null hypothesis will be rejected if a sufficiently large number of samples is taken" (Page 3-6). Said differently, the site dataset could be negligibly above the background dataset, but if the dataset is large enough the population test will conclude site concentrations are above background concentrations – this would be conservative. Therefore, if the sole goal is to be conservative, the GWRA has followed an approach consistent with that goal. The second concern regarding the Form 1 hypothesis is valid. If sample sizes are too small, the test becomes more unlikely to reject the null hypothesis – as DOI notes, this is potentially non-conservative. However, based on guidance presented in the RAWP, a minimum number of samples and detections were specified to ensure that sample sizes were not too small to conduct the statistical tests. In particular, the cutoff of eight or more samples and five or more detections was defined in the approved	2

9 CalEPA. 1997. Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments at Hazardous Waste Sites and Permitted Facilities. Final Policy. California Environmental Protection Agency.

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			RAWP for calculating 95%UCLs in ProUCL. Accordingly, population tests were performed only on well/chemical pairs with eight or more samples and five or more detections. Well/chemical pairs with smaller datasets were assumed to be above background. Based on these factors, we believe that Form 1 is consistent with agency guidance, consistent with standard risk assessment practice, and sufficiently conservative for our application. We do not believe that going back and questioning the basic rationale behind the agency guidance, and what is standard practice at sites throughout California, particularly for a topic that affects only 4 percent of the dataset for the entire site, is a useful exercise nor likely to in any material way affect the conclusions of the GWRA.	
DOI SC19	Section 4.1.1, Page 4-2	Please describes how the Upper Tolerance Limits (UTLs) were computed and evaluate the significance of the type UTLs used in the background screening (i.e., Figure 4-1 et al.,). Specifically, are they parametric, non parametric, or more a mixture of both? Parametric UTLs are appropriate when the underlying data is normally or lognormally distributed. In general, if the data are not normally or lognormally distributed, non parametric UTLs are appropriate. The significance is that a parametric UTL will usually be lower value than a non parametric counterpart for the same data. When used to screen maximums for outliers (as the case in GWRA) using a lower UTL is more conservative than using a higher UTL. See also our discussion of the UTL as a conservative screening tool the in previous comment. If non parametric UTL95%95% were used, the initial screening step in Figure 4-1 could be highly non conservative and the significance may have to be evaluated.	The methodology used in calculating background threshold values was documented in the Groundwater Background Study (CH2M HILL, 2008c), which was reviewed and approved by DOI. The RAWP very clearly states that it will rely on these UTLs in certain steps of the risk assessment process, and presumes that details regarding the methods used in the development of the UTLs do not need to be re-iterated or re-evaluated for appropriateness. Please refer to the approved Groundwater Background Study for details regarding the methods used in calculating the UTLs. In brief, and as described in the approved background study (CH2M Hill, 2008c), parametric 95%UTL are used when datasets fit a normal or lognormal distribution as determined by the Shapiro-Wilke test. When a nonparametric UTL is developed, the upper percentile is based on the size of the dataset, and not strictly the 95th percentile as is the case with parametric UTLs. In general, background datasets contained 25 values except in cases where outliers were thrown out (e.g., zinc has 24 values). As documented in the background study: "When 25 values were available, the non-parametric UTL is a 95 percent upper confidence bound of the 89th percentile. For zinc, where 24 values were available, the non-parametric UTL is a 95 percent upper confidence bound of the 88th percentile. Thus, there is a slightly higher opportunity for declaring a result to be in exceedance of background when a non-parametric UTL is calculated." (CH2M Hill, 2008c, page 3-3) Thus, all nonparametric UTLs were calculated as the 95%UCL bound of the 89th or 88th percentile. No nonparametric 95%UTLs are used. Nonparametric UTLs were calculated for aluminum, antimony, beryllium, cadmium, chromium, cobalt, hexavalent chromium, lead, mercury, nickel, silver, thallium, vanadium, and zinc. Parametric UTLs were calculated for arsenic, barium, copper, fluoride, molybdenum, nitrate as nitrogen, and selenium. We note that the UTLs for nitrate and fluoride were not presented in the groundwater background study; they were calculated using the dataset and rules presented in the background study and were presented in the RFI Volume 2 Report.	2

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			The comment that "using a lower UTL is more conservative than using a higher UTL" goes against the objectives of the UTL process. The third and fourth sentences of the comment correctly describe the process of using parametric versus non-parametric UTLs. When this process is followed, there is no choice involved in using UTLs — if the distribution is not normal or lognormal, we cannot (and did not) use the presumably more conservative parametric UTL. The use of a non-parametric UTL is neither a choice nor a shortcoming — it is a statistically appropriate approach, given the properties of the dataset.	
DOI SC20	Figure 5-1, Related Discussion and Ensuing Analysis.	Figure 5-1 is incomplete; all pertinent groundwater pathways are not included in the exposure and risk models. • The hypothetical future use of groundwater to water plants and poultry exposure pathway has not been included. These pathways have been acknowledge as necessary for DOI's unrestricted land use consideration must be incorporated for the GRRA to be complete. Please develop the pathways, transport and fate models and parameters, and perform and integrate the calculations. • The recreational use and aquatic ecological receptor pathways should also acknowledge the ingestion and dermal contact pathways. Evaluation of the pathways should be performed or credible rationale provided as to why not. Please revise Section 5 accordingly and perform all consequential analysis.	Based on our experiences at numerous other sites with impacted groundwater, where the goal of groundwater cleanup is to allow for future domestic (unrestricted) use of the groundwater, uptake of chemicals by plants/livestock from irrigation/agricultural and other livestock-support uses of the water does not alter the final cleanup goals for water (i.e., our experiences have been that risk-based cleanup goals for water, and/or MCLs, are assumed by the regulatory agencies to be protective of any and all uses of the water). Accordingly, we had proposed to address the potential uptake into plants/livestock in the upcoming soils risks assessment, when the information regarding the concentrations of chemicals in soil was available and could be incorporated into the evaluation. Based on our discussions with DOI, they appear to be concerned that the water could be safe for human consumption, and yet contribute to unacceptable exposures via other secondary pathways, and thus, result in the need to clean up the groundwater to a lower level than would be required for the protection of direct human consumption/domestic use pathways. Although we have never seen such a situation, and examples were not provided, PG&E conducted some preliminary calculations, as requested by DOI, to ensure that these secondary groundwater exposure pathways would not likely alter the risk-based cleanup levels currently presented in the GWRA. Specifically, an analysis of the ingestion of plant and animal products as a pathway for exposure to contaminated groundwater was conducted based on the OEHHA *Air Toxics Hot Spots Guidelines* (CalEPA, 2003[10]) to assess the potential relative magnitude of this pathway as compared to direct dermal exposure to and ingestion of contaminated groundwater. Section 5 of the Hot Spots Guidance provides equations for calculating the exposure of humans to COPCs through ingestion of plants and animals impacted by COPCs. First, uptake of COPCs by plants and animals is estimated. Second, the ingestion of these plant and animal products is calculated to	2

10 Cal/EPA. 2003. Air Toxics Hot Spots Program Risk Assessment Guidelines: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA). August.
11 Cary, E.E. 1982. Chromium in air, soils, and natural waters, in Biological and environmental aspects of chromium, Langard, Ed., Elsevier Biomedical Press, New York, 49–63.
12 WHO. 1988. Chromium. World Health Organization., Environ. Health Criter., Vol. 61, 197.
13 Ramachandran, V., D'Souza, T. J., and Mistry, K. B. 1980. Uptake and transport of chromium in plants. *J. Nucl. Agric. Biol.*, 9(4), 126.
14 Aldrich, M.V., J.L. Gardea-Torresdey, J.R. Peralta-Videa, and J.G. Parsons. 2003. Uptake and Reduction of Cr(VI) to Cr(III) by Mesquite (Prosopis spp.): Chromate-Plant Interaction in Hydroponics and Solid Media Studied Using XAS. *Environ. Sci. Technol.* 37:1859-1864.
15 Cary, E.E. 1982. Chromium in air, soils, and natural waters, in Biological and environmental aspects of chromium, Langard, Ed., Elsevier Biomedical Press, New York, 49–63.
16 WHO. 1988. Chromium. World Health Organization., Environ. Health Criter., Vol. 61, 197.
17 ATSDR, 2008. Toxicological Profile for Chromium, Draft, U.S. Department of Health & Human Services, Agency for Toxic Substances and Disease Registry, Washington, D.C. September.
18 Petrilli, F. L. and De Flora, S., 1978. Metabolic deactivation of hexavalent chromium mutagenicity, *Mutat. Res.*, 54(2)139–147.

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			estimate human exposure to COPCs. Plant COPC concentrations are based on uptake from soil impacted by irrigation. Animal COPC concentrations are based the following: • Uptake from ingestion of drinking water • Uptake from ingestion of soil impacted by irrigation water • Uptake from ingestion of plants impacted by irrigation water Throughout the analysis, the most conservative assumptions are made to quantify the magnitude of the dose resulting from this pathway. The Hot Spots Guidance calculates the concentration of the contaminant in soil from the deposition of the pollutant from some concentration in air. Because this is a groundwater risk assessment, potential deposition of the pollutant occurs through irrigation and not through aerial deposition. It is conservatively assumed that 100% of the irrigation water is polluted groundwater. Furthermore, it is assumed all of the contamination stays within the root zone where plants could be exposed. The calculation of the soil concentration is unlikely to impact the overall conclusions as the contribution of plant uptake from soil impacted by irrigation water and animal uptake from ingestion of soil and plants impacted by irrigation water is insignificant in comparison to animal uptake from ingestion of drinking water; in other words, only the animal uptake from drinking water is significant in the context of this analysis. The analysis is conducted for hexavalent chromium, the primary COC at the site. As noted above, the dominant contributor to the overall pathway is animal uptake from ingestion of drinking water, in particular beef cattle. It is conservatively assumed that 100% of the water ingested by the animals is polluted groundwater. The ingestion of water by animals contributes 100% (99.99997%) to the dose of the contaminant to animals. The ingestion of animal products contributes 100% (99.99995%) to the overall dose to humans by the ingestion of animal and plant products. To evaluate the significance of the plant and animal ingestion exposure pathway, the contributions of direct dermal exposure and water ingestion (the pathways considered in the risk assessment) are added to the contribution calculated for ingestion of plant and animal products. Using conservative assumptions to calculate the exposure dose to humans from the ingestion of plant and animal products, this pathway contributes 3.2% and 1.4% to the estimated hexavalent chromium cumulative noncancer hazard to adults and children, respectively. It is expected that conducting this analysis for other COPCs will result in similar results. Therefore, inclusion of this pathway is highly unlikely to affect the overall conclusions of the risk assessment, across all COPCs.	

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			Moreover, specifically for hexavalent chromium, there is some uncertainly as to the uptake of the hexavalent form. Some studies have indicated that chromium accumulation in plants is predominately in roots, and only a small fraction is translocated to the above-ground part of edible plants (Cary, 1982[11]; WHO, 1988[12]). In this analysis, hexavalent chromium is conservatively assumed to remain in its oxidized form throughout the pathway. Hexavalent chromium is reduced to trivalent chromium, a less toxic form of chromium, at the surface of plant root cells (Ramachandran, 1980[13]; Aldrich et al., 2003[14]), indicating plant uptake/translocation of hexavalent chromium would be minimal. Other studies have indicated that chromium accumulation in plants is predominately in roots and only a small fraction is translocated to the above-ground part of edible plants (Cary, 1982[15]; WHO, 1988[16]). There has been no evidence of chromium biomagnification along the terrestrial food chain (soil-plant-animal) (ATSDR, 2008[17]). Furthermore, the metabolism of animals has been shown to reduce hexavalent chromium to trivalent chromium (Petrilli, 1978[18]). Therefore, human exposure to hexavalent chromium through ingestion of plants and animals is potentially an incomplete/insignificant pathway. This discussion and corresponding conclusions will be added as an appendix to the final GWRA.	
DOI SC21	Section 7 Overall and Future Integration.	As PG&E reviews and revises the GWRA, it is important to recognize that groundwater is only one exposure pathway in the overall conceptual site model (CSM). A concern that should be addressed in the GWRA, and in the CMS/FS, is how will forthcoming soil exposure risks (and cumulative HI's) be factored into the overall site wide risk assessment? DOI is concerned that situations analogous to that "summing of HI's and risks for individual groundwater chemicals" discussed above will occur again when the "summing of HI's and risks for individual chemicals from multiple pathways" occurs when the soil risks are evaluated. The simplified model below illustrates this concern: • Summed HI all pathways = GW HI + Soils HI • Summed HI all pathways 1.8 = GW 0.9 (no action) + Soils 0.9 (no action). • Summed HI risk all pathways Risk Management Need ≠ GW (no action) + Soils (no action) This takes on added significance in light of the rapid pace of the CMS/FS. For this reason, we ask PG&E to propose a risk management plan to anticipate those situations in future. Since the GWRA precedes the soil assessment, and groundwater risk management plans are in balance, we urge PG&E's risk management plan leave some safeguard space for the forthcoming soils.	We have been discussing the implications of separating the groundwater and soil risk assessments/remedies for quite some time with all stakeholders. The project proceeded with the separate risk evaluations at the request of DTSC to expedite addressing the CMS/FS for groundwater impacts associated with SWMU 1/AOC 1. All in all, although there are clearly some advantages of evaluating risks and developing remedies for the groundwater and the soil at the same time, separating the media (i.e., soil and groundwater) into different OUs is common, and allows the risk-managers to move forward with a needed remedy for one media (e.g., groundwater), while the data collection efforts and evaluations are still being conducted for another media (e.g., soil). We have proceeded in such a manner here, at the request of the agencies, in order to continue to move forward and select a remedy for the known significant groundwater impacts associated with the site, while continuing the characterization efforts for the soil. As we have discussed, it is impossible, at this juncture, to completely understand the significance of hypothetical cumulative risk issues associated with the groundwater and soil media, because we don't have a sense of the overall magnitude of the soil-related components. However, risk management decisions are routinely made for one environmental media (groundwater) prior to the development of the risk-management decisions for another environmental media (soil). We have discussed this issue with DOI, and have asked for practical solutions to these hypothetical problems, and there were no suggestions that provide insight as to how this issue has been addressed at other sites. One key factor to keep in mind during the remedy selection process for both soils and groundwater: when cleanup goals are established, either for soil or groundwater, the practical reality is that post-	2

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FMIT	Fort Mojave Indian Tribe (submitted by Michael J. Sullivan, PhD, CIH)
HERD-JME	Department of Toxic Substances Control, Human and Ecological Risk Division (submitted by J. Michael Eichelberger, PhD)
HERD-SRS	Department of Toxic Substances Control, Human and Ecological Risk Division (submitted by Shukla Roy-Semmen, PhD)
MWD	Metropolitan Water District (submitted by Bart Koch)

Comment Number	Section/ Page	Comment	Response	Comment Category
			remedial conditions rarely result in media-specific concentrations exactly meeting the cleanup goal. For soil, as the most obvious example, if it is determined that remediation is needed, then chemical-specific remediation goals are developed and a remediation plan is developed and implemented in order achieve the overall goals of the protection of human health and the environment. However, typically one or two chemicals are the principal contributors to risk, and the remedial plan invariably winds up reducing the target compounds to concentrations that are lower than the initial goal. Accordingly, the assumption that all chemicals, in all media, are going to remain at residual concentrations exactly equal to the initial target goal is unrealistic, and unlikely to occur. More common, particularly for soil, is that one sets a risk-based goal, and then the remedial efforts typically wind up reducing the soil concentrations to much lower than the original goal (particularly true for excavations). At this stage, a logical and efficient program would be to continue in the current path for the development of a protective remedial plan for the groundwater. Groundwater cleanup goals to be set forth in the CMS/FS are likely to include ARARs (i.e., MCLs), background levels, and RBCs. Once we have a better sense of how many chemicals are present in the soil, and what the soil risk-drivers are at the various AOCs across the site, then the potential cumulative impact associated with compounds in soil and the compounds likely to remain in groundwater (following the implementation of the remediation plans) can be discussed, brought to the stakeholders, and solutions can be put forth by all with the benefit of a more comprehensive understanding of overall site-wide conditions. Practical solutions can be discussed once we understand the number of chemicals that are potentially driving the risks for the soil. That will be the time to set soil remedial goals at levels that account for all COCs and can allow for a 'margin' of safety due to the presence of residual chemicals in the groundwater. That is, once we understand which chemicals are driving the risks for soil, we can decide in the soil CMS/FS to set the remedial goals for the soil at a level that balances overall cumulative risks and hazards in order to account for the mix of chemicals in both soil and groundwater. Ultimately, the decisions for soil residual concentrations will have to address both human and ecological concerns and also combine that with groundwater cleanup goals. In sum, it is impossible at this juncture, to provide a definitive detailed solution for all chemicals in all media for all relevant receptors (both human and ecological), given that we know very little about one large set of variables at the site (soil conditions). However, once we have a better understanding of the types and number of chemicals that are present in the soil, and the receptor and exposure pathways of concern, we can develop a remedial plan for soil that accounts for projected residual concentrations that may remain in the groundwater following the implementation of the groundwater remedy, if appropriate.	
DOI SC22	Section 7.2.1.2 and 7.2.2	The Site-Wide groundwater interpretation provided in Section 7 (and the Executive Summary), is intended provide the reader an understanding of groundwater contamination, from a health risk perspective, in relation to the existence of the Cr VI plume. The chemical-by-chemical assessment of frequency and magnitude of detection, sensitivity to the use of maximums etc. in Section 7 does lend perspective on a	As discussed with the agencies, and as presented in the GWRA, chemicals to be carried forward as COCs in the groundwater CMS/FS for SWMU 1/AOC 1 are those chemicals that are: 1) determined to be present in site groundwater at levels of potential concern to future human health or the environment, and 2) likely associated with groundwater at SWMU 1/AOC 1. Thus, a chemical like fluoride, which is not	1

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3. Editorial comments on text that don't affect the outcome or conclusions

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		site-wide basis. However; the synthesis of the chemical-by-chemical "site-wide" perspective leads to some problematic issues when individual wells are considered as single points of exposure. DOI considers each well as a potential source of exposure. In essence, the fusion leads to a finding that, for remediation purposes, only Cr VI needs to be considered as a driving COPC. DOI does not agree that the data and analysis support this conclusion. Problems with this conclusion**(see table at end of document) can be gleaned from the table below: This table, derived from a brief inspection of Table 7-2, indicates that constitutes other than Cr VI, either individually (e.g., Fl), or in combination can affect the findings and the remediation decision(s). As illustrated, under the rationale advanced in Section 7, the groundwater represented by these four wells, located outside of the Cr VI plume, would not be considered for remediation in the CMS/FS. DOI cannot support an assessment rationale that could lead to findings whereby groundwater(s) that pose a substantial risk can be knowingly left unaddressed. Moreover, the synthesis, while clearly informative and resourceful, conflicts with standard CERCLA and RCRA risk-based assessment (Risk Assessment Guide for Superfund (RAGS) and does not reflect how assessing this situation was originally understood in the RAWP. In order to gauge the impact of site related contaminants on groundwater, PG&E must determine the areal extent of groundwater that exceeds risk management thresholds. Those thresholds, which are discussed in the RAWP and in numerous guidance are 1E-4 to 1E-6 lifetime excess cancer risk, and cumulative hazard index's of 1.0 and greater. In order for PG&E and stakeholders to understand the site-wide groundwater impacts, and in order to not miss focus the CMS/FS site-wide groundwater risk assessment issues, we request PG&E to prepare site-wide maps illustrating: • Iso-Contours of cumulative estimated cancer risk exceeding 1E-6 and E-4. This illustration should correspond with Table 7-1 (following revisions as discussed above) • Iso-contours of cumulative estimated non cancer hazard index exceeding 1.0, 5.0, 10, and 20. This illustration should correspond with Table 7-2 (following revisions as discussed above). Interpretation of these iso-contours, in terms of the areal of groundwater exceeding reasonable maximum exposure (RME) based risk management metrics, should serve as a point of departure for risk-based CMS/FS efforts. Moreover, interpreting the iso-contours in this light could suggest areas where additional information could be useful in determining the scope of groundwater remedial actions. If PG&E seeks to refine the iso-contours, from a risk assessment perspective, they must use, as a minimum, the "risk-based" approach discussed in RAGS Section 8 the RAWP. This technique uses	associated with groundwater at SWMU 1/AOC 1, would not be carried forward to the CMS/FS for SWMU 1/AOC 1. As directed by DTSC and DOI, the text of the GWRA will be revised to indicate that they consider any individual monitoring well with an HI > 1 to be of potential concern (refer to response to comment HERD-SRS GC5). Accordingly, as the GWRA indicates an HI > 1 at one or more monitoring wells for hexavalent chromium, selenium, nitrate and molybdenum, and as all four of these chemicals are potentially associated with groundwater at SWMU 1/AOC 1, the final GWRA will recommend that the following chemicals be considered COCs in the CMS/FS for SWMU 1/AOC 1: hexavalent chromium, selenium, nitrate, and molybdenum. Based on our discussions with both DTSC and DOI, we believe that both agencies are in agreement with these recommendations. The CMS/FS may discuss other chemicals, not associated with SWMU 1/AOC 1, that were identified in the GWRA as having an HI of >1, but the only chemicals that would be considered COCs would be hexavalent chromium, selenium, nitrate, and molybdenum. As requested, the final GWRA will present figures indicating the cumulative HIs and cancer risks at each location.	

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<table>
<tr><th>Comment Number</th><th>Section/ Page</th><th>Comment</th><th>Response</th><th>Comment Category</th></tr>
<tr><td></td><td></td><td>recomputing HI's based on segregated target organs and effects. PG&E's method for determining material contribution to elevated noncancer HI (Appendix K) can be used as a point of departure to focus this effort.

**Conclusion Problems Table
<table><tr><th>Well</th><th>Plume Grouping</th><th>Cumulative HI</th><th>Main Contributors</th><th>Finding Under PG&E Synthesis</th><th>Finding Under RAGS Approach [a]</th></tr><tr><td>MW -1</td><td>Out</td><td>9.9</td><td>Fl 8.5
Mo 1.0</td><td>Not Considered for Remediation</td><td>Consider for Remediation</td></tr><tr><td>MW - 6</td><td>Out</td><td>9.2</td><td>Fl 9.2</td><td>Not Considered for Remediation</td><td>Consider for Remediation</td></tr><tr><td>MW - 14</td><td>Out</td><td>1.5</td><td>Cr VI 0.94
N (as No^3) 0.29
Co 0.22</td><td>Not Considered for Remediation</td><td>Initially Consider for Remediation, Apply RAGS Rationale</td></tr><tr><td>OW-2S</td><td>Out</td><td>1.7</td><td>Cr VI 0.86
Mo 0.61
N (No^3) 0.20</td><td>Not Considered for Remediation</td><td>Consider for Remediation, Apply RAGS Rationale</td></tr><tr><td>CW-2D</td><td>Out</td><td>6.7</td><td>Fl 4.7
Mo 0.79
Vn 1.1</td><td>Not Considered for Remediation</td><td>Consider for Remediation</td></tr></table>Note that all contributing constituents above have been included as well specific COCs through the background screening process and are therefore, ostensibly considered site related.
[a] RAGS = Risk Assessment Guidance for Superfund approach is discussed below.</td><td></td><td></td></tr>
<tr><td>DOI SC23</td><td>Section 7.3.2.6, Page 7-18</td><td>Since selenium is identified as a facility related compound, provide a map similar to Figure 7-3 for selenium.</td><td>The requested map will be provided.</td><td>3</td></tr>
<tr><td>DOI SC24</td><td>Section 7.3.3.2,</td><td>Could leaded gasoline have contributed to the lead in groundwater?</td><td>As described in the RFI/RI Volume 2, lead in the groundwater is not related to SWMU 1/AOC 1. The identification of the potential source of lead detected in the groundwater is outside the scope of the</td><td>No change</td></tr>
</table>

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	Page 7-22,		GWRA.	
DOI SC25	Section 7.5 Summary of Constituents of Concern	Please revise this section and the Executive Summary as appropriate following completion of the forgoing comments.	See above.	
DOI SC26	Section 8	Please revise this section and the Executive Summary as appropriate following revision of Section 7.5	See above.	
DOI SC27	Section 9	This section is informative and well done. However, in light of the comments provided above, DOI reserves comment until completion of the forgoing comments. It is likely that the relevance of some of the discussion will change.	See above.	
DOI SC28	Table 2-1	Please fix the typo for "Stripped skunk."	The noted typo will be corrected.	3

Table 1. Maximum Rooting Depths of Site-Specific Phreatophytes

Species of Phreatophyte	Maximum Root Depth (feet)	Reference
Honey Mesquite (*Prosopis glandulosa*)	49	Glenn and Nagler (2005), Alth et al. (1991)
Palo Verde (*Cercidium* sp.)	50	Deep roots, not as deep as mesquite, Barth and Klemmedson (1982), MW-21 well near pure Palo Verde has about 50' depth to groundwater
Tamarisk (*Tamarix* sp.) (esp. Salt Cedar)	25	Glenn and Nagler (2005), Shrader (1977)
Arrowweed (*Pluchea sericea*)	20	Alth et al. (1991)
Catclaw Acacia (*Acacia greggii*)	>18	Zimmerman (1969)

References:

Alth, M., and C. Alth, revised by S.B. Duncan. 1991. Wells and septic systems. McGraw-Hill Professional. p. 121.

Barth, R.C., and J.O. Klemmedson. 1982. Amount and distribution of dry matter, nitrogen, and organic carbon in soil-plant systems of mesquite and palo verde. *Journal of Range Management* 35:412-418.

Glenn, E.P. and Nagler, P.L. 2005. Comparative ecophysiology of *Tamarix ramosissima* and native trees in western U.S. riparian zones. *Journal of Arid Environments* 61:419-446.

Shrader, T.H. 1977. Selective management of phreatophytes for improved utilization of natural flood-plain resources. Water management for irrigation and drainage. Proceedings of the Society of Civil Engineering 2:16–44.

Zimmermann, R. C. 1969. Plant ecology of an arid basin: Tres Alamos-Redington Area, southeastern Arizona. Geological Survey Professional Paper 485-D. Washington, DC: U.S. Department of the Interior, Geological Survey. 51 p.

Table 2. Data Usability Matrix

COPC	Total Number of Samples	Total Number of Nondetects	Minimum Detection Limit[1] (mg/L)	Maximum Detection Limit[1] (mg/L)	Mode Detection Limit[1] (mg/L)	Background Upper Tolerance Limit (UTL) (mg/L)	Number of Detection Limits Above the UTL[1]	Percentage of Detection Limits Above the UTL[1,2a]	Risk-based Concentration (RBC) (mg/L)	Number of Detection Limits Above the RBC[1]	Percentage of Detection Limits Above the RBC[1,2b]	Maximum Contaminant Level (MCL) (mg/L)	Number of Detection Limits Above the MCL[1]	Percentage of Detection Limits Above the MCL[1,2b]	Surface Water Criteria (mg/L)	Number of Detection Limits Above the Surface Water Criteria[1]	Detection Limits Above the Surface Water Criteria[1,2c]	Number of "J" Qualified Samples	Number of "UJ" Qualified Samples	Number of "R" Qualified Samples	Number of "UR" Qualified Samples
Aluminum	294	273	5.0E-02	5.2E-01	5.2E-02	5.58E-02	10	3.7%	1.55E+01	0	0.0%	1.00E+00	0	0.0%	1.00E+00	0	0.0%	1	0	0	0
Antimony	384	375	2.0E-03	2.0E-02	2.0E-03	1.22E-03	375	100.0%	6.22E-03	1	0.3%	6.00E-03	1	0.3%	6.00E-03	1	0.3%	0	0	0	0
Arsenic	460	270	1.0E-03	4.0E-02	5.0E-03	2.43E-02	2	0.7%	7.07E-06	270	100.0%	1.00E-02	2	0.7%	1.00E-02	2	0.7%	0	0	0	0
Barium	559	198	1.0E-03	5.0E-01	3.0E-01	1.95E-01	197	99.5%	3.11E+00	0	0.0%	1.00E+00	0	0.0%	4.00E-03	197	99.5%	8	0	0	0
Beryllium	374	354	1.0E-03	1.2E-02	1.0E-03	6.63E-04	354	100.0%	3.11E-02	0	0.0%	4.00E-03	10	2.8%	6.60E-04	354	100.0%	0	3	0	0
Cadmium	374	373	1.0E-03	1.2E-02	1.0E-03	NA	NA	NA	7.77E-03	1	0.3%	5.00E-03	1	0.3%	5.00E-03	1	0.3%	0	0	0	0
Chromium, hexavalent	2,780	1,130	2.0E-04	1.0E-02	1.0E-03	3.18E-02	0	0.0%	4.63E-02	0	0.0%	5.00E-02	0	0.0%	1.10E-02	0	0.0%	60	57	8	16
Cobalt	374	361	1.0E-03	1.2E-02	5.0E-03	8.43E-04	361	100.0%	4.66E-03	136	37.7%	NA	NA	NA	2.30E-02	0	0.0%	0	0	0	0
Copper	1,049	691	1.0E-03	4.0E-01	1.0E-02	1.05E-02	120	17.4%	6.22E-01	0	0.0%	1.30E+00	0	0.0%	2.30E-02	25	3.6%	202	0	0	0
Fluoride	491	65	1.0E-01	1.3E+01	5.0E+00	7.12E+00	6	9.2%	9.32E-01	39	60.0%	2.00E+00	27	41.5%	2.00E+00	27	41.5%	7	6	0	0
Lead	474	412	1.0E-03	1.0E-01	1.0E-03	1.91E-03	268	65.0%	NA	NA	NA	1.50E-02	3	0.7%	8.00E-03	3	0.7%	23	0	0	0
Mercury	380	379	2.0E-04	5.0E-04	2.0E-04	NA	NA	NA	4.66E-03	0	0.0%	2.00E-03	0	0.0%	5.00E-05	379	100.0%	1	1	0	0
Molybdenum	563	35	2.0E-03	5.0E-02	5.0E-03	3.63E-02	7	20.0%	7.77E-02	0	0.0%	NA	NA	NA	3.70E-01	0	0.0%	4	0	0	0
Nickel	1,049	570	1.0E-03	4.0E-01	2.0E-02	1.06E-02	420	73.7%	3.12E-01	6	1.1%	1.00E-01	6	1.1%	1.00E-01	6	1.1%	222	1	0	0
Nitrate as nitrogen	844	271	1.0E-01	2.0E+02	5.0E-01	5.03E+00	4	1.5%	2.49E+01	1	0.4%	1.00E+01	1	0.4%	1.00E+01	1	0.4%	23	7	1	1
Selenium	396	228	1.0E-03	4.0E-02	5.0E-03	1.03E-02	1	0.4%	7.77E-02	0	0.0%	5.00E-02	0	0.0%	5.00E-03	85	37.3%	0	0	0	0
Silver	374	366	1.0E-03	5.0E-02	1.0E-03	2.13E-03	226	61.7%	7.79E-02	0	0.0%	1.00E-01	0	0.0%	3.60E-04	366	100.0%	0	1	0	0
Thallium	374	372	1.0E-03	6.0E-02	1.0E-03	9.08E-04	372	100.0%	1.01E-03	129	34.7%	2.00E-03	121	32.5%	1.70E-03	129	34.7%	0	1	0	0
Vanadium	462	90	1.0E-03	1.2E-02	5.0E-03	5.99E-02	0	0.0%	1.09E-01	0	0.0%	5.00E-02	0	0.0%	2.00E-02	0	0.0%	29	1	0	0
Zinc	1,049	324	5.0E-03	2.0E-01	2.0E-02	7.77E-02	8	2.5%	4.67E+00	0	0.0%	5.00E+00	0	0.0%	3.00E-01	0	0.0%	98	6	0	0

Notes:

(1) Only detection limits from nondetect samples are included in these analyses. The percentage shown is the percentage of nondetect samples.

(2) The implications of elevated detection limits on the risk assessment are discussed in detail in Section 9 and presented in Tables 9-1 thru 9-4. Data usability is also discussed in Sections 3.2.3 and 3.3 and presented in Table 3-9.

(a) In particular see discussion in Section 9.2.3 and Table 9-1 regarding the possibility of incorrectly excluding a chemical from the assessment, and the likelihood that this could result in a material underestimation of risk and/or hazard.

(b) In particular see discussion in Section 9.4.2.1 and Table 9-4 regarding the possibility of that elevated detection limits could result in the underestimation of risk/and or hazard.

(c) In particular see discussion in Section 9.3 and Tables 9-2 and 9-3 regarding the possibility detection limits could impact the significance of the groundwater-to-surface water transport pathway.

(3) NA = Not available, one of the folllowing applies:

(a) Cadmium and mercury were not detected in background wells, and therefore UTLs were not calculated in the background study, CH2MHILL (2008).

(b) As described in Section 6.3 of the text, the noncarcinogenic hazard from lead is not evaluated using the traditional reference dose approach and therefore a risk-based concentration cannot be calculated for lead.

(c) MCLs are not promulgated for cadmium or molybdenum.

(4) Laboratory qualifiers:

J = Estimated

UJ = Estimated nondetect

R = Rejected

UR = Rejected nondetect

B = The analyte was detected above MDL in the lab blank

Table 3. Statistical Summary of Initial Chemical of Potential Concern (ICOPC) Concentrations in Groundwater – Well-Specific – Population Comparision

Extracted from Table 4-1b from the GWRA for chemical/well pairs screened-out of the risk assessment by population tests.

Chemical of Potential Concern	Well	Number of Samples	Number of Detections	Minimum Detection (mg/L)	Maximum Detection (mg/L)	Background Upper Tolerance Limit (UTL) (mg/L)	Number of Detections Above the UTL	95% UCL (mg/L)	Quantile Test Conclusion	Relevant Median Test	Gehan p-value	Median Test Conclusion	Include in Risk Assessment?
Chromium, hexavalent	MW-23	36	14	0.0011	1.02	0.0318	1	0.0943	Site ≤ Background	Gehan	0.689	Site ≤ Background	N
Chromium, hexavalent	MW-34-80	88	13	0.00086	0.111	0.0318	3	0.00731	Site ≤ Background	Gehan	1	Site ≤ Background	N
Copper	OW-5M	14	5	0.0016	0.0114	0.0105	2	0.00694	Site ≤ Background	Gehan	0.214	Site ≤ Background	N
Nitrate as nitrogen	OW-1M	16	16	0.892	6.49	5.03	1	3.24	Site ≤ Background	Gehan	0.289	Site ≤ Background	N
Nitrate as nitrogen	OW-5D	15	15	0.151	5.99	5.03	1	2.861	Site ≤ Background	Gehan	0.521	Site ≤ Background	N
Nitrate as nitrogen	OW-5M	15	15	0.51	8.155	5.03	1	2.944	Site ≤ Background	Gehan	0.809	Site ≤ Background	N
Selenium	OW-2D	14	5	0.00208	0.0171	0.0103	1	0.00724	Site ≤ Background	Gehan	0.109	Site ≤ Background	N
Vanadium	MW-11	13	13	0.0036	0.0859	0.0599	1	0.0413	Site ≤ Background	Gehan	0.814	Site ≤ Background	N
Vanadium	MW-25	13	11	0.0051	0.0733	0.0599	1	0.036	Site ≤ Background	Gehan	0.857	Site ≤ Background	N
Vanadium	MW-34-80	13	10	0.0016	0.238	0.0599	1	0.204	Site ≤ Background	Gehan	0.996	Site ≤ Background	N
Vanadium	MW-37D	13	11	0.004	0.326	0.0599	1	0.187	Site ≤ Background	Gehan	0.927	Site ≤ Background	N
Vanadium	OW-1M	14	12	0.00184	0.0625	0.0599	1	0.0376	Site ≤ Background	Gehan	0.632	Site ≤ Background	N
Vanadium	OW-2D	14	10	0.00148	0.0862	0.0599	1	0.0455	Site ≤ Background	Gehan	0.724	Site ≤ Background	N
Vanadium	OW-2M	13	11	0.0021	0.0913	0.0599	1	0.0489	Site ≤ Background	Gehan	0.768	Site ≤ Background	N
Zinc	MW-12	41	30	0.0046	0.54	0.0777	4	0.0689	Site ≤ Background	Gehan	0.441	Site ≤ Background	N
Zinc	MW-34-55	14	9	0.0141	0.163	0.0777	2	0.0612	Site ≤ Background	Gehan	0.214	Site ≤ Background	N
Zinc	MW-34-80	18	9	0.0232	0.0854	0.0777	2	0.0465	Site ≤ Background	Gehan	0.481	Site ≤ Background	N
Zinc	MW-37D	13	5	0.011	0.0918	0.0777	1	0.0407	Site ≤ Background	Gehan	0.927	Site ≤ Background	N
Zinc	OW-5M	14	5	0.0238	0.278	0.0777	1	0.0964	Site ≤ Background	Gehan	0.869	Site ≤ Background	N

Notes:

(1) Data shown here have a detection above the background upper tolerance limit (UTL) and a minimum of eight samples and five detections.

(2) The Quantile Test and a median test (either the Mann-Whitney Test or Gehan Test) were preformed in ProUCL to test the hypothesis that the distribution of concentrations at a given well is below the background distribution.

(3) 95% upper confidence limits (UCL) calculated in ProUCL.

(4) Nitrate as NO_{3}-, nitrate as nitrogen, and nitrate/nitrite as nitrogen are combined in this analysis.

(5) Based on the ProUCL manual recommendations, the Gehan test is used for chemicals for which either the background or sample data set has more than 40% nondetects or multiple detection limits. The Mann-Whitney test is used for all other cases.

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Hexavalent Chromium Result (mg/L)	Nondetect?
MW-23_03/25/2000	03/25/2000	MW-23	0.01	ND
MW-23_03/28/2001	03/28/2001	MW-23	0.01	ND
MW-23_06/06/2001	06/06/2001	MW-23	0.01	ND
MW-23_06/14/2000	06/14/2000	MW-23	0.01	ND
MW-23_06/15/1998	06/15/1998	MW-23	0.01	ND
MW-23_06/15/1999	06/15/1999	MW-23	0.01	ND
MW-23_09/01/2000	09/01/2000	MW-23	0.01	ND
MW-23_09/12/2001	09/12/2001	MW-23	0.01	ND
MW-23_09/14/1999	09/14/1999	MW-23	0.01	ND
MW-23_11/30/2001	11/30/2001	MW-23	0.01	ND
MW-23_12/01/1999	12/01/1999	MW-23	0.01	ND
MW-23_12/01/2000	12/01/2000	MW-23	0.01	ND
MW-23_12/11/02_LS	12/11/2002	MW-23	0.01	ND
MW-23-001_03/08/2002	03/08/2002	MW-23	0.01	ND
MW-23-002_6/13/02	06/13/2002	MW-23	0.01	ND
MW-23-003	09/18/2002	MW-23	0.01	ND
MW-23-005	03/21/2003	MW-23	0.01	ND
MW-23-006	06/12/2003	MW-23	0.01	ND
MW-23-007	09/10/2003	MW-23	0.0002	ND
MW-23-009	12/11/2003	MW-23	0.0002	ND
MW-23-018	03/16/2004	MW-23	0.0033	
MW-23-030	06/08/2004	MW-23	0.0101	
MW-23-043	09/21/2004	MW-23	0.0068	
MW-23-049	12/17/2004	MW-23	0.0011	
MW-23-056	03/08/2005	MW-23	0.001	ND
MW-23-070	06/14/2005	MW-23	0.0089	
MW-23-081	10/04/2005	MW-23	0.001	ND
MW-23-087	12/14/2005	MW-23	0.0088	
MW-23-093	03/08/2006	MW-23	0.0119	
MW-23-098	05/02/2006	MW-23	0.0168	
MW-23-110	10/04/2006	MW-23	0.0152	
MW-23-115	12/12/2006	MW-23	0.0144	
MW-23-121	03/06/2007	MW-23	1.02	
MW-23-125	05/02/2007	MW-23	0.013	
MW-23-136	10/04/2007	MW-23	0.0192	
MW-23-143	05/06/2008	MW-23	0.0232	

Notes:

Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Hexavalent Chromium Result (mg/L)	Nondetect?
MW-34/80-009	12/11/2003	MW-34-80	0.0377	
MW-34-080-056	03/08/2005	MW-34-80	0.001	ND
MW-34-080-057	03/15/2005	MW-34-80	0.001	ND
MW-34-080-058	03/22/2005	MW-34-80	0.001	ND
MW-34-080-059	03/29/2005	MW-34-80	0.001	ND
MW-34-080-061	04/12/2005	MW-34-80	0.001	ND
MW-34-080-062	04/19/2005	MW-34-80	0.001	ND
MW-34-080-063	04/26/2005	MW-34-80	0.001	ND
MW-34-080-064	05/04/2005	MW-34-80	0.001	ND
MW-34-080-066	05/18/2005	MW-34-80	0.001	ND
MW-34-080-068	06/01/2005	MW-34-80	0.001	ND
MW-34-080-070	06/30/2005	MW-34-80	0.001	ND
MW-34-080-074	07/14/2005	MW-34-80	0.001	ND
MW-34-080-077	08/15/2005	MW-34-80	0.001	ND
MW-34-080-079	09/07/2005	MW-34-80	0.001	ND
MW-34-080-081	10/05/2005	MW-34-80	0.001	ND
MW-34-080-083	11/03/2005	MW-34-80	0.001	ND
MW-34-080-087	12/14/2005	MW-34-80	0.001	ND
MW-34-080-089	01/11/2006	MW-34-80	0.001	ND
MW-34-080-091	02/08/2006	MW-34-80	0.001	ND
MW-34-080-093	03/09/2006	MW-34-80	0.001	ND
MW-34-080-095	04/03/2006	MW-34-80	0.001	ND
MW-34-080-098	05/03/2006	MW-34-80	0.001	ND
MW-34-080-102	06/14/2006	MW-34-80	0.001	ND
MW-34-080-104	07/12/2006	MW-34-80	0.001	ND
MW-34-080-106	08/08/2006	MW-34-80	0.001	ND
MW-34-080-108	09/06/2006	MW-34-80	0.001	ND
MW-34-080-110	10/04/2006	MW-34-80	0.001	ND
MW-34-080-113	11/16/2006	MW-34-80	0.001	ND
MW-34-080-115	12/12/2006	MW-34-80	0.001	ND
MW-34-080-117	01/09/2007	MW-34-80	0.001	ND
MW-34-080-119	02/05/2007	MW-34-80	0.001	ND
MW-34-080-121	03/05/2007	MW-34-80	0.001	ND
MW-34-080-123	04/02/2007	MW-34-80	0.0002	ND
MW-34-080-125	04/30/2007	MW-34-80	0.001	ND
MW-34-080-128	06/13/2007	MW-34-80	0.001	ND
MW-34-080-130	07/11/2007	MW-34-80	0.001	ND
MW-34-080-132	08/08/2007	MW-34-80	0.001	ND
MW-34-080-134	09/06/2007	MW-34-80	0.001	ND
MW-34-080-136	10/03/2007	MW-34-80	0.0002	ND

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Hexavalent Chromium Result (mg/L)	Nondetect?
MW-34-080-143	05/06/2008	MW-34-80	0.0002	ND
MW-34-80-006-AT	06/16/2003	MW-34-80	0.01	ND
MW-34-80-006-BT	06/17/2003	MW-34-80	0.01	ND
MW-34-80-011	01/29/2004	MW-34-80	0.111	
MW-34-80-012	02/05/2004	MW-34-80	0.0129	
MW-34-80-015	02/26/2004	MW-34-80	0.092	
MW-34-80-016	03/05/2004	MW-34-80	0.0256	
MW-34-80-017	03/11/2004	MW-34-80	0.0073	
MW-34-80-018	03/17/2004	MW-34-80	0.0057	
MW-34-80-019	03/25/2004	MW-34-80	0.0037	
MW-34-80-020	04/01/2004	MW-34-80	0.0022	
MW-34-80-021	04/08/2004	MW-34-80	0.002	
MW-34-80-022	04/16/2004	MW-34-80	0.00086	
MW-34-80-023	04/22/2004	MW-34-80	0.00087	
MW-34-80-024	04/29/2004	MW-34-80	0.002	ND
MW-34-80-025	05/06/2004	MW-34-80	0.001	ND
MW-34-80-026	05/13/2004	MW-34-80	0.001	ND
MW-34-80-027	05/20/2004	MW-34-80	0.001	ND
MW-34-80-028	05/27/2004	MW-34-80	0.001	ND
MW-34-80-029	06/02/2004	MW-34-80	0.002	ND
MW-34-80-030	06/08/2004	MW-34-80	0.001	ND
MW-34-80-031	06/17/2004	MW-34-80	0.001	ND
MW-34-80-032	06/23/2004	MW-34-80	0.001	ND
MW-34-80-033	06/30/2004	MW-34-80	0.001	ND
MW-34-80-034	07/07/2004	MW-34-80	0.001	ND
MW-34-80-035	07/15/2004	MW-34-80	0.001	ND
MW-34-80-036	07/21/2004	MW-34-80	0.001	ND
MW-34-80-037	07/27/2004	MW-34-80	0.001	ND
MW-34-80-038	08/05/2004	MW-34-80	0.001	ND
MW-34-80-039	08/12/2004	MW-34-80	0.001	ND
MW-34-80-040	08/20/2004	MW-34-80	0.001	ND
MW-34-80-041	08/26/2004	MW-34-80	0.001	ND
MW-34-80-042	09/08/2004	MW-34-80	0.001	ND
MW-34-80-043	09/23/2004	MW-34-80	0.001	ND
MW-34-80-044	10/06/2004	MW-34-80	0.001	ND
MW-34-80-045	10/20/2004	MW-34-80	0.001	ND
MW-34-80-046	11/02/2004	MW-34-80	0.001	ND
MW-34-80-047	11/17/2004	MW-34-80	0.001	ND
MW-34-80-048	12/02/2004	MW-34-80	0.001	ND
MW-34-80-049	12/13/2004	MW-34-80	0.001	ND
MW-34-80-050	12/29/2004	MW-34-80	0.001	ND

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Hexavalent Chromium Result (mg/L)	Nondetect?
MW-34-80-051	01/12/2005	MW-34-80	0.001	ND
MW-34-80-052	01/27/2005	MW-34-80	0.001	ND
MW-34-80-053	02/08/2005	MW-34-80	0.001	ND
MW-34-80-054	02/22/2005	MW-34-80	0.001	ND
MW-34-80-055	03/01/2005	MW-34-80	0.001	ND

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Hexavalent Chromium Result (mg/L)	Nondetect?
MW-34-80-060	04/05/2005	MW-34-80	0.001	ND
MW-34-80-WV-014	02/18/2004	MW-34-80	0.0204	

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Copper Result (mg/L)	Nondetect?
OW-05M-003	09/13/2005	OW-5M	0.0114	
OW-05M-004	10/20/2005	OW-5M	0.01	ND
OW-05M-005	11/15/2005	OW-5M	0.01	ND
OW-05M-006	12/06/2005	OW-5M	0.01	ND
OW-05M-007	03/15/2006	OW-5M	0.01	ND
OW-05M-008	06/07/2006	OW-5M	0.01	ND
OW-05M-009	08/30/2006	OW-5M	0.01	ND
OW-05M-010	10/11/2006	OW-5M	0.01	ND
OW-05M-012	04/30/2007	OW-5M	0.001	ND
OW-05M-014	10/17/2007	OW-5M	0.00331	
OW-05M-075	07/28/2005	OW-5M	0.005	ND
OW-05M-077	08/26/2005	OW-5M	0.0058	
OW-5M-WQ5	01/13/2005	OW-5M	0.0106	
OW-5M-WQ6	05/11/2005	OW-5M	0.0016	

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Nitrate as Nitrogen Result (mg/L)	Nondetect?
OW-01M-003	09/14/2005	OW-1M	1.35	
OW-01M-004	10/19/2005	OW-1M	4.64	
OW-01M-005	11/14/2005	OW-1M	6.49	
OW-01M-006	12/05/2005	OW-1M	2.65	
OW-01M-007	03/14/2006	OW-1M	3.18	
OW-01M-008	06/06/2006	OW-1M	2.73	
OW-01M-009	08/31/2006	OW-1M	2.45	
OW-01M-010	10/10/2006	OW-1M	2.98	
OW-01M-011	01/25/2007	OW-1M	2.43	
OW-01M-012	05/01/2007	OW-1M	1.41	
OW-01M-013	08/09/2007	OW-1M	2.775	
OW-01M-014	10/16/2007	OW-1M	2.56	
OW-01M-075	07/27/2005	OW-1M	1.01	
OW-01M-077	08/25/2005	OW-1M	1.38	
OW-1M	10/01/2004	OW-1M	0.91	
OW-1M-WQ6	05/10/2005	OW-1M	0.892	

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Nitrate as Nitrogen Result (mg/L)	Nondetect?
OW-05M-003	09/13/2005	OW-5M	0.69	
OW-05M-004	10/20/2005	OW-5M	0.655	
OW-05M-005	11/15/2005	OW-5M	2.05	
OW-05M-006	12/06/2005	OW-5M	0.66	
OW-05M-007	03/15/2006	OW-5M	1.15	
OW-05M-008	06/07/2006	OW-5M	1.4	
OW-05M-009	08/30/2006	OW-5M	2.48	
OW-05M-010	10/11/2006	OW-5M	3.15	
OW-05M-011	01/25/2007	OW-5M	2.5	
OW-05M-012	04/30/2007	OW-5M	2.1	
OW-05M-013	08/08/2007	OW-5M	8.155	
OW-05M-014	10/17/2007	OW-5M	2.72	
OW-05M-075	07/28/2005	OW-5M	0.621	
OW-05M-077	08/26/2005	OW-5M	0.619	
OW-5M-WQ6	05/11/2005	OW-5M	0.51	

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Nitrate as Nitrogen Result (mg/L)	Nondetect?
OW-05D-003	09/13/2005	OW-5D	0.334	
OW-05D-004	10/19/2005	OW-5D	1.54	
OW-05D-005	11/15/2005	OW-5D	5.99	
OW-05D-006	12/06/2005	OW-5D	2.24	
OW-05D-007	03/15/2006	OW-5D	3.23	
OW-05D-008	06/07/2006	OW-5D	2.72	
OW-05D-009	08/30/2006	OW-5D	2.68	
OW-05D-010	10/11/2006	OW-5D	3.3	
OW-05D-011	01/25/2007	OW-5D	2.7	
OW-05D-012	05/01/2007	OW-5D	1.46	
OW-05D-013	08/09/2007	OW-5D	2.615	
OW-05D-014	10/17/2007	OW-5D	2.83	
OW-05D-075	07/28/2005	OW-5D	0.151	
OW-05D-077	08/26/2005	OW-5D	0.241	
OW-5D-WQ6	05/11/2005	OW-5D	0.159	

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Selenium Result (mg/L)	Nondetect?
OW-02D-003	09/14/2005	OW-2D	0.01	ND
OW-02D-004	10/20/2005	OW-2D	0.005	ND
OW-02D-005	11/14/2005	OW-2D	0.0056	
OW-02D-006	12/05/2005	OW-2D	0.0065	
OW-02D-007	03/14/2006	OW-2D	0.005	ND
OW-02D-008	06/07/2006	OW-2D	0.005	ND
OW-02D-009	08/31/2006	OW-2D	0.005	ND
OW-02D-010	10/10/2006	OW-2D	0.005	ND
OW-02D-012	04/30/2007	OW-2D	0.00208	
OW-02D-014	10/17/2007	OW-2D	0.00254	
OW-02D-075	07/28/2005	OW-2D	0.01	ND
OW-02D-077	08/25/2005	OW-2D	0.01	ND
OW-2D-WQ5	01/13/2005	OW-2D	0.0171	
OW-2D-WQ6	05/10/2005	OW-2D	0.001	ND

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Vanadium Result (mg/L)	Nondetect?
CIS-021	05/03/2007	MW-11	0.007880001	
MW-11_07/01/1997	07/01/1997	MW-11	0.024	
MW-11_09/01/2000	09/01/2000	MW-11	0.0061	
MW-11_11/28/2001	11/28/2001	MW-11	0.0036	
MW-11-043	09/21/2004	MW-11	0.0058	
MW-11-049	12/17/2004	MW-11	0.0099	
MW-11-056	03/08/2005	MW-11	0.0859	
MW-11-070	06/16/2005	MW-11	0.00831	
MW-11-081	10/03/2005	MW-11	0.0063	
MW-11-087	12/12/2005	MW-11	0.0083	
MW-11-093	03/06/2006	MW-11	0.008940001	
MW-11-098	05/09/2006	MW-11	0.008759999	
MW-11-110	10/12/2006	MW-11	0.00871	

Notes:

Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Vanadium Result (mg/L)	Nondetect?
MW-25_06/15/1999	06/15/1999	MW-25	0.012	
MW-25_09/01/2000	09/01/2000	MW-25	0.0051	
MW-25_11/29/2001	11/29/2001	MW-25	0.0077	
MW-25-030	06/09/2004	MW-25	0.003	ND
MW-25-043	09/22/2004	MW-25	0.003	ND
MW-25-056	03/09/2005	MW-25	0.0733	
MW-25-070	06/14/2005	MW-25	0.0118	
MW-25-081	10/04/2005	MW-25	0.0066	
MW-25-087	12/14/2005	MW-25	0.0097	
MW-25-093	03/09/2006	MW-25	0.0118	
MW-25-098	05/03/2006	MW-25	0.012	
MW-25-110	10/03/2006	MW-25	0.0112	
MW-25-121	03/06/2007	MW-25	0.0111	

Notes:

Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Vanadium Result (mg/L)	Nondetect?
MW-34-080-056	03/08/2005	MW-34-80	0.238	
MW-34-080-070	06/30/2005	MW-34-80	0.00274	
MW-34-080-081	10/05/2005	MW-34-80	0.005	ND
MW-34-080-087	12/14/2005	MW-34-80	0.0135	
MW-34-080-093	03/09/2006	MW-34-80	0.00294	
MW-34-080-098	05/03/2006	MW-34-80	0.00244	
MW-34-080-110	10/04/2006	MW-34-80	0.00234	
MW-34-080-115	12/12/2006	MW-34-80	0.0016	
MW-34-080-121	03/05/2007	MW-34-80	0.00161	
MW-34-080-125	04/30/2007	MW-34-80	0.00167	
MW-34-80-030	06/08/2004	MW-34-80	0.003	ND
MW-34-80-043	09/23/2004	MW-34-80	0.003	ND
MW-34-80-049	12/13/2004	MW-34-80	0.0153	

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Vanadium Result (mg/L)	Nondetect?
MW-37D-030	06/11/2004	MW-37D	0.003	ND
MW-37D-043	09/24/2004	MW-37D	0.003	ND
MW-37D-049	12/14/2004	MW-37D	0.0314	
MW-37D-056	03/11/2005	MW-37D	0.326	
MW-37D-070	06/15/2005	MW-37D	0.004	
MW-37D-081	10/04/2005	MW-37D	0.006	
MW-37D-087	12/14/2005	MW-37D	0.0145	
MW-37D-093	03/13/2006	MW-37D	0.00717	
MW-37D-098	05/03/2006	MW-37D	0.00625	
MW-37D-110	10/13/2006	MW-37D	0.00608	
MW-37D-115	12/14/2006	MW-37D	0.00614	
MW-37D-121	03/07/2007	MW-37D	0.00503	
MW-37D-125	05/03/2007	MW-37D	0.00501	

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Vanadium Result (mg/L)	Nondetect?
OW-01M-003	09/14/2005	OW-1M	0.0133	
OW-01M-004	10/19/2005	OW-1M	0.0521	
OW-01M-005	11/14/2005	OW-1M	0.0625	
OW-01M-006	12/05/2005	OW-1M	0.0054	
OW-01M-007	03/14/2006	OW-1M	0.0193	
OW-01M-008	06/06/2006	OW-1M	0.0121	
OW-01M-009	08/31/2006	OW-1M	0.005	ND
OW-01M-010	10/10/2006	OW-1M	0.005	ND
OW-01M-012	05/01/2007	OW-1M	0.00184	
OW-01M-014	10/16/2007	OW-1M	0.00309	
OW-01M-049	12/21/2004	OW-1M	0.0147	
OW-01M-075	07/27/2005	OW-1M	0.0147	
OW-01M-077	08/25/2005	OW-1M	0.0122	
OW-1M-WQ6	05/10/2005	OW-1M	0.00545	

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Vanadium Result (mg/L)	Nondetect?
OW-02D-003	09/14/2005	OW-2D	0.017	
OW-02D-004	10/20/2005	OW-2D	0.0862	
OW-02D-005	11/14/2005	OW-2D	0.052	
OW-02D-006	12/05/2005	OW-2D	0.005	ND
OW-02D-007	03/14/2006	OW-2D	0.0126	
OW-02D-008	06/07/2006	OW-2D	0.0118	
OW-02D-009	08/31/2006	OW-2D	0.005	ND
OW-02D-010	10/10/2006	OW-2D	0.005	ND
OW-02D-012	04/30/2007	OW-2D	0.00148	
OW-02D-014	10/17/2007	OW-2D	0.00181	
OW-02D-075	07/28/2005	OW-2D	0.0172	
OW-02D-077	08/25/2005	OW-2D	0.0152	
OW-2D-WQ5	01/13/2005	OW-2D	0.0177	
OW-2D-WQ6	05/10/2005	OW-2D	0.001	ND

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Vanadium Result (mg/L)	Nondetect?
OW-02M-003	09/14/2005	OW-2M	0.0124	
OW-02M-004	10/20/2005	OW-2M	0.0913	
OW-02M-005	11/15/2005	OW-2M	0.0518	
OW-02M-006	12/06/2005	OW-2M	0.0069	
OW-02M-007	03/14/2006	OW-2M	0.0158	
OW-02M-008	06/07/2006	OW-2M	0.011	
OW-02M-009	08/30/2006	OW-2M	0.005	ND
OW-02M-010	10/10/2006	OW-2M	0.005	ND
OW-02M-012	04/30/2007	OW-2M	0.0021	
OW-02M-014	10/16/2007	OW-2M	0.00238	
OW-02M-075	07/28/2005	OW-2M	0.0144	
OW-02M-077	08/25/2005	OW-2M	0.0114	
OW-2M-WQ6	05/11/2005	OW-2M	0.00296	

Notes:

Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Zinc Result (mg/L)	Nondetect?
MW-12_02/17/1998	02/17/1998	MW-12	0.016	
MW-12_03/25/2000	03/25/2000	MW-12	0.019	
MW-12_03/28/2001	03/28/2001	MW-12	0.016	
MW-12_06/06/2001	06/06/2001	MW-12	0.016	
MW-12_06/15/1998	06/15/1998	MW-12	0.011	
MW-12_06/15/1999	06/15/1999	MW-12	0.0046	
MW-12_06/15/2000	06/15/2000	MW-12	0.018	
MW-12_07/01/1997	07/01/1997	MW-12	0.017	
MW-12_09/01/1997	09/01/1997	MW-12	0.034	
MW-12_09/01/2000	09/01/2000	MW-12	0.01	
MW-12_09/12/2001	09/12/2001	MW-12	0.025	
MW-12_09/14/1999	09/14/1999	MW-12	0.0096	
MW-12_11/29/2001	11/29/2001	MW-12	0.071	
MW-12_12/01/1999	12/01/1999	MW-12	0.0077	
MW-12_12/01/2000	12/01/2000	MW-12	0.017	
MW-12_12/11/02_LS	12/11/2002	MW-12	0.06939999	
MW-12-001_03/07/2	03/07/2002	MW-12	0.0688	
MW-12-003	09/16/2005	MW-12	0.0755	
MW-12-0032002	09/18/2002	MW-12	0.0845	
MW-12-005	03/20/2003	MW-12	0.54	
MW-12-006	06/11/2003	MW-12	0.121	
MW-12-007	09/09/2003	MW-12	0.0261	ND
MW-12-009	12/10/2003	MW-12	0.02	ND
MW-12-018	03/16/2004	MW-12	0.0948	
MW-12-030	06/09/2004	MW-12	0.01	
MW-12-043	09/20/2004	MW-12	0.0192	
MW-12-056	03/10/2005	MW-12	0.0546	
MW-12-070	06/13/2005	MW-12	0.0244	
MW-12-081	10/04/2005	MW-12	0.02	ND
MW-12-087	12/13/2005	MW-12	0.02	ND
MW-12-093	04/18/2006	MW-12	0.01	ND
MW-12-098	05/01/2006	MW-12	0.01	ND
MW-12-110	10/04/2006	MW-12	0.01	ND
MW-12-115	12/13/2006	MW-12	0.0224	
MW-12-121	03/06/2007	MW-12	0.01	ND
MW-12-125	05/03/2007	MW-12	0.01	ND
MW-12-136	10/04/2007	MW-12	0.01	ND
MW-12-138	12/13/2007	MW-12	0.02	ND

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Zinc Result (mg/L)	Nondetect?
MW-12-141	03/10/2008	MW-12	0.0221	
MW-12-143	05/05/2008	MW-12	0.0344	
MW-40-002_6/13/02	06/13/2002	MW-12	0.033	

Notes:

Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Zinc Result (mg/L)	Nondetect?
MW-34-055-056	03/10/2005	MW-34-55	0.0877	
MW-34-055-081	10/05/2005	MW-34-55	0.0227	
MW-34-055-087	12/14/2005	MW-34-55	0.02	ND
MW-34-055-093	03/08/2006	MW-34-55	0.01	ND
MW-34-055-098	05/03/2006	MW-34-55	0.0141	
MW-34-055-110	10/04/2006	MW-34-55	0.01	ND
MW-34-55-006-AT	06/16/2003	MW-34-55	0.0744	
MW-34-55-006-BT	06/17/2003	MW-34-55	0.163	
MW-34-55-007	09/10/2003	MW-34-55	0.0349	
MW-34-55-009	12/12/2003	MW-34-55	0.0378	
MW-34-55-018	03/17/2004	MW-34-55	0.0831	ND
MW-34-55-030	06/08/2004	MW-34-55	0.01	ND
MW-34-55-043	09/22/2004	MW-34-55	0.0227	
MW-34-55-049	12/15/2004	MW-34-55	0.0251	

Notes:
Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Zinc Result (mg/L)	Nondetect?
MW-34/80-009	12/11/2003	MW-34-80	0.0348	
MW-34-080-056	03/08/2005	MW-34-80	0.0417	
MW-34-080-070	06/30/2005	MW-34-80	0.037	
MW-34-080-081	10/05/2005	MW-34-80	0.02	ND
MW-34-080-087	12/14/2005	MW-34-80	0.02	ND
MW-34-080-093	03/09/2006	MW-34-80	0.01	ND
MW-34-080-098	05/03/2006	MW-34-80	0.031	
MW-34-080-110	10/04/2006	MW-34-80	0.01	ND
MW-34-080-115	12/12/2006	MW-34-80	0.01	ND
MW-34-080-121	03/05/2007	MW-34-80	0.01	ND
MW-34-080-125	04/30/2007	MW-34-80	0.01	ND
MW-34-80-006-AT	06/16/2003	MW-34-80	0.0692	
MW-34-80-006-BT	06/17/2003	MW-34-80	0.0854	
MW-34-80-007	09/10/2003	MW-34-80	0.0792	
MW-34-80-018	03/17/2004	MW-34-80	0.0755	ND
MW-34-80-030	06/08/2004	MW-34-80	0.01	ND
MW-34-80-043	09/23/2004	MW-34-80	0.0232	
MW-34-80-049	12/13/2004	MW-34-80	0.0297	

Notes:

Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Zinc Result (mg/L)	Nondetect?
MW-37D-030	06/11/2004	MW-37D	0.01	ND
MW-37D-043	09/24/2004	MW-37D	0.0248	
MW-37D-049	12/14/2004	MW-37D	0.0918	
MW-37D-056	03/11/2005	MW-37D	0.0387	
MW-37D-070	06/15/2005	MW-37D	0.011	
MW-37D-081	10/04/2005	MW-37D	0.02	ND
MW-37D-087	12/14/2005	MW-37D	0.02	ND
MW-37D-093	03/13/2006	MW-37D	0.01	ND
MW-37D-098	05/03/2006	MW-37D	0.01	ND
MW-37D-110	10/13/2006	MW-37D	0.01	ND
MW-37D-115	12/14/2006	MW-37D	0.0266	
MW-37D-121	03/07/2007	MW-37D	0.01	ND
MW-37D-125	05/03/2007	MW-37D	0.01	ND

Notes:

Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column

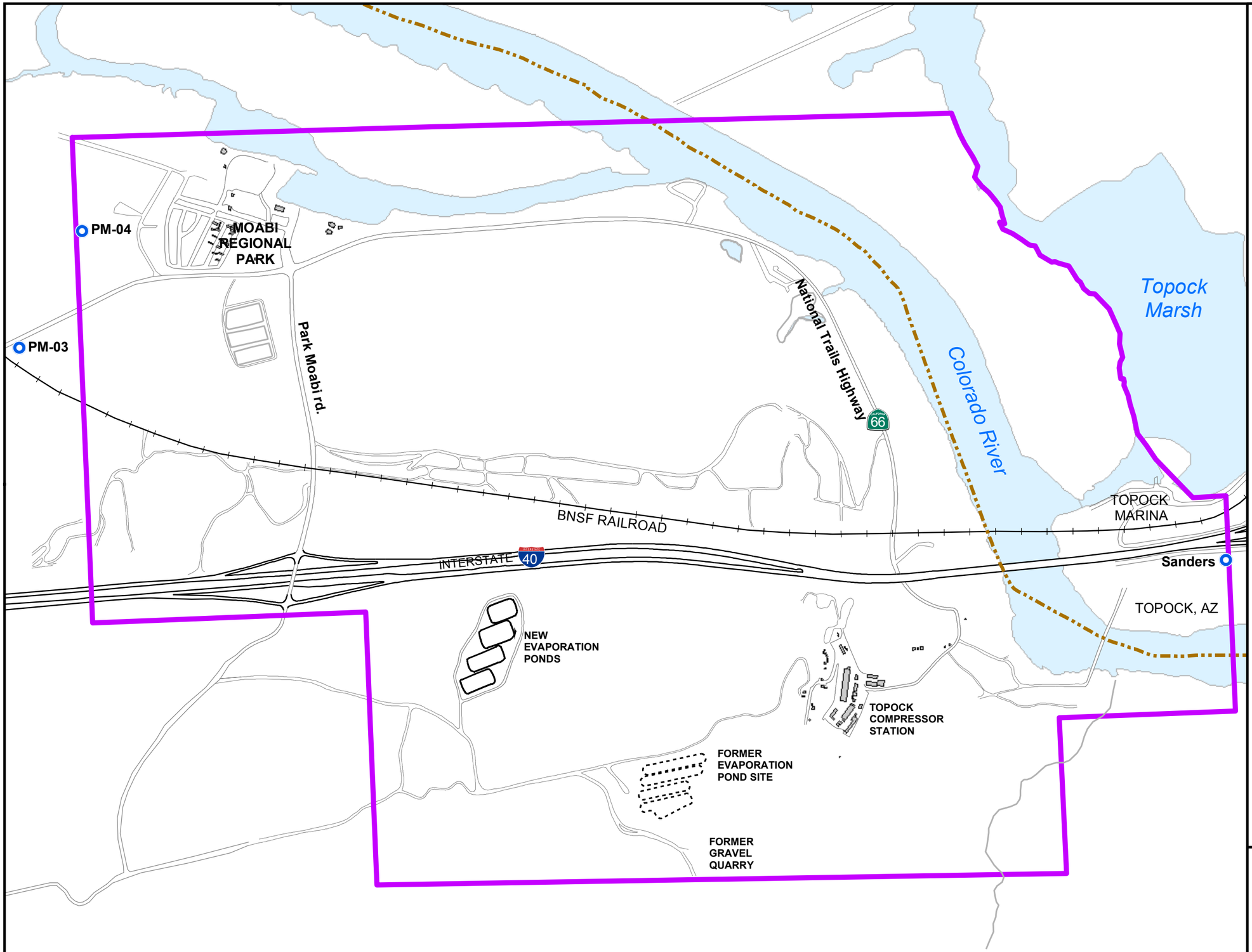
Table 4. Raw Data for Chemicals Screened Out of the Risk Assessment by Population Tests

Raw data for Table 3.

Sample_ID	Sample_Date	Well_ID	Zinc Result (mg/L)	Nondetect?
OW-05M-003	09/13/2005	OW-5M	0.0264	
OW-05M-004	10/20/2005	OW-5M	0.02	ND
OW-05M-005	11/15/2005	OW-5M	0.025	
OW-05M-006	12/06/2005	OW-5M	0.0238	
OW-05M-007	03/15/2006	OW-5M	0.02	ND
OW-05M-008	06/07/2006	OW-5M	0.02	ND
OW-05M-009	08/30/2006	OW-5M	0.02	ND
OW-05M-010	10/11/2006	OW-5M	0.02	ND
OW-05M-012	04/30/2007	OW-5M	0.01	ND
OW-05M-014	10/17/2007	OW-5M	0.278	
OW-05M-075	07/28/2005	OW-5M	0.0122	ND
OW-05M-077	08/26/2005	OW-5M	0.0156	ND
OW-5M-WQ5	01/13/2005	OW-5M	0.0373	
OW-5M-WQ6	05/11/2005	OW-5M	0.01	ND

Notes:

Nondetect results are indicated with "ND" and the reporting limit is presented in the Result column



LEGEND

- Supply Well
- California-Arizona Border
- Area of Potential Effect

N

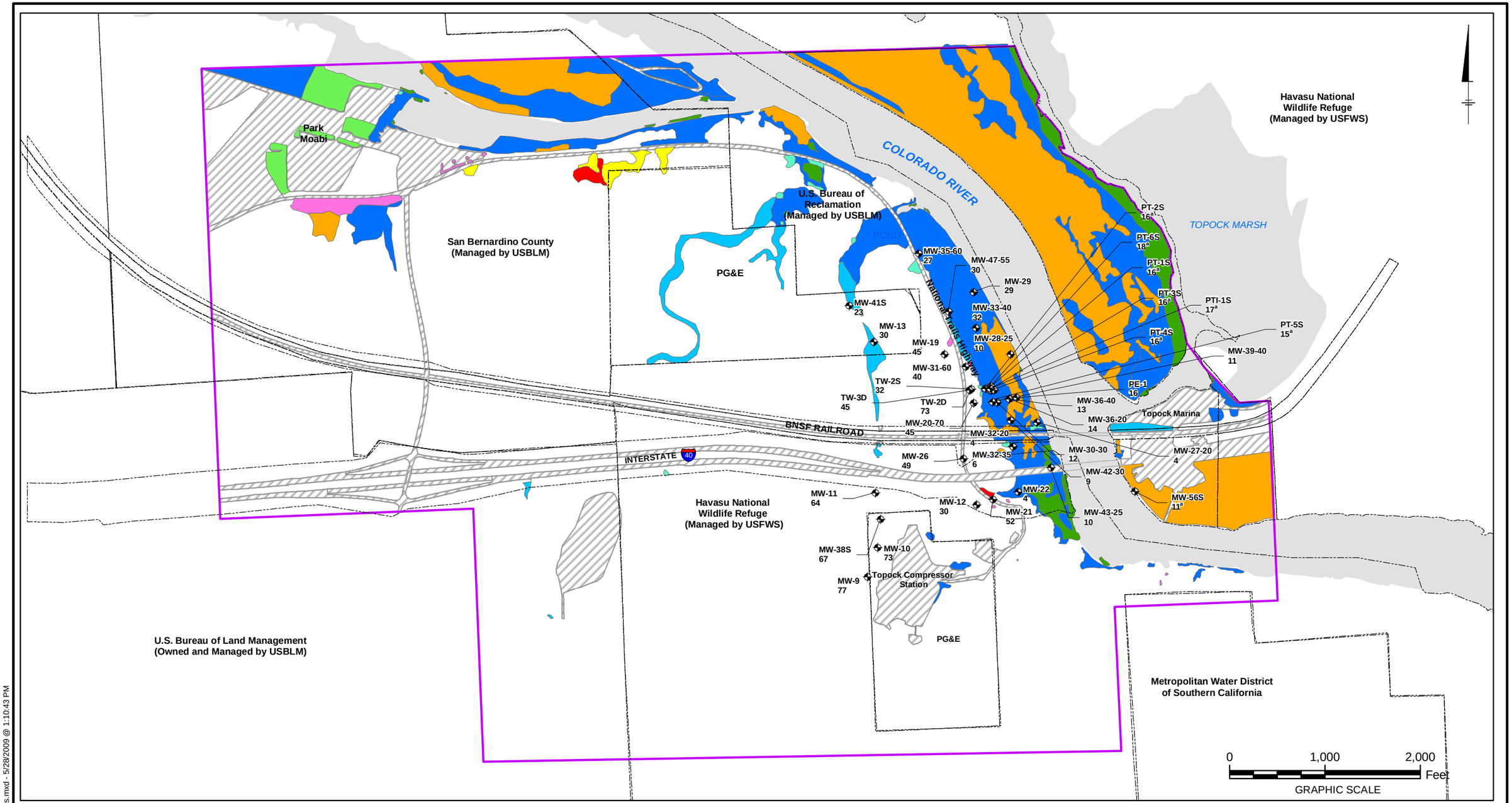
0 600 1,200 Feet

FIGURE 1
Topock Compressor Station

RCRA FACILITY INVESTIGATION/REMEDIAL INVESTIGATION REPORT (VOLUME 2)
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

CH2MHILL

BAO \\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MAPFILES\2009\POTABLE_WELLS.MXD 5/12/2009 15:16:44



LEGEND:

- Arrowweed
- Landscaped
- Mesquite
- Mesquite/Palo Verde
- Palo Verde
- Salt Bush
- Salt Cedar
- Salt Cedar/Mesquite
- Wetland/Marsh
- Developed Area
- Monitoring Wells
- Property Boundaries
- Area of Potential Effects
- MW-16 — Well ID
- 199 — Depth to Groundwater (ft bgs)

NOTES:

ft bgs = feet below ground surface

1. Figure includes all active wells found in the Shallow Zone of the Alluvial Aquifer in which groundwater was encountered within 80 ft bgs. Well ID list from Table B-1 - Drilling and Well Construction Summary for the RFI/RI Characterization (Appendix B, RFI/RI Vol. 2, CH2HILL, 2008).
2. Approximate depth to groundwater calculated from data presented in Table B-1 - Drilling and Well Construction Summary for RFI/RI Characterization, Appendix B. RFI/RI Volume 2. (CH2MHILL, 2008)
3. Extent of vegetation communities from Figure 6 of the Programmatic Biological Assessment for Pacific Gas and Electric Topock Compressor Station Remedial and Investigative Actions report (CH2MHILL, 2007).

[a] Depth to water data from Appendix B of the May 2007 Monitoring Report for the Floodplain Reductive Zone In-Situ Pilot Test (ARCADIS, 2007).

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

GROUNDWATER HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

DEPTH TO GROUNDWATER IN WATER TABLE WELLS AND POTENTIALLY EXPOSED VEGETATION

ARCADIS

FIGURE 2

[WC-85 VJR] SANF-85 EGH
Project (RC000689.0002 Task 2)
Q:\PGETopockGW_Risk\MXD\Plume_Veg_Wells.mxd - 5/28/2009 @ 1:10:43 PM

MW-35-60		
Cr VI	Mo	Se
0.0351	0.00856	0.00119

MW-47-55		
Cr VI	Mo	Se
0.0619	0.00805	0.00146

MW-29		
Cr VI	Mo	Se
ND	0.021	ND

MW-33-40		
Cr VI	Mo	Se
0.00068	ND	ND

MW-41S		
Cr VI	Mo	Se
0.0199	ND	ND

PT-4S		
Cr VI	Mo	Se
ND†	ND†	ND†

PT-2S		
Cr VI	Mo	Se
0.0005†	ND†	ND†

MW-13		
Cr VI	Mo	Se
0.028	0.02	0.00396

PT-1S		
Cr VI	Mo	Se
0.006†	ND†	ND†

MW-28-25		
Cr VI	Mo	Se
ND	0.0076	ND

PT-6S		
Cr VI	Mo	Se
0.0011†	ND†	ND†

PT-5S		
Cr VI	Mo	Se
ND†	ND†	ND†

PE-1		
Cr VI	Mo	Se
0.148	ND	ND

MW-36-20		
Cr VI	Mo	Se
0.0026	ND	ND

MW-36-40		
Cr VI	Mo	Se
ND	ND	ND

MW-27-20		
Cr VI	Mo	Se
ND	0.0067	ND

PTI-1S		
Cr VI	Mo	Se
ND†	ND†	ND†

MW-11		
Cr VI	Mo	Se
1.71	0.035	0.0136

PT-3S		
Cr VI	Mo	Se
ND†	ND†	ND†

MW-42-30		
Cr VI	Mo	Se
ND	ND	ND

MW-56S		
Cr VI	Mo	Se
ND	ND	ND

MW-22		
Cr VI	Mo	Se
ND	0.0562	ND

MW-30-30		
Cr VI	Mo	Se
ND	0.1	ND

MW-39-40		
Cr VI	Mo	Se
ND	ND	ND

Park Moabi

San Bernardino County (Managed by USBLM)

U.S. Bureau of Reclamation (Managed by USBLM)

PG&E

COLORADO RIVER

TOPOCK MARSH

POND

National Trails Highway

BNSF RAILROAD

INTERSTATE 40

Havasu National Wildlife Refuge (Managed by USFWS)

Havasu National Wildlife Refuge (Managed by USFWS)

Topock Marina

Topock Compressor Station

PG&E

U.S. Bureau of Land Management (Owned and Managed by USBLM)

Metropolitan Water District of Southern California

0 1,000 2,000 Feet

GRAPHIC SCALE

LEGEND:

- Arrowweed
- Landscaped
- Mesquite
- Mesquite/Palo Verde
- Palo Verde
- Salt Bush
- Salt Cedar
- Salt Cedar/Mesquite
- Wetland/Marsh
- Developed Area
- Monitoring Wells
- Property Boundaries
- Area of Potential Effects

MW-9		
Cr VI	Mo	Se
0.402	0.0053	0.0132

Well ID

Maximum Detected Concentration (mg/L)

NOTES:

ft bgs = feet below ground surface
mg/L = milligrams per liter
ND = Non Detect

1. Figure includes active wells found in the Shallow Zone of the Alluvial Aquifer in which groundwater was encountered within 80 ft bgs and which occur in or are within close proximity to phreatophyte vegetation communities. Well ID list from Table B-1 - Drilling and Well Construction Summary for RFI/RI Characterization (Appendix B, RFI/RI Vol. 2, CH2MHILL, 2008).
2. ND indicates COPC was not detected during sampling events.
3. † Values from Table 3-FP Primary Parameters, First Quarter 2009 Groundwater Monitoring Report (ARCADIS, 2009)
4. Extent of vegetation communities from Figure 6 of the Programmatic Biological Assessment for Pacific Gas and Electric Topock Compressor Station Remedial and Investigative Actions report (CH2MHILL, 2007).

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

GROUNDWATER HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

MAXIMUM COPC CONCENTRATIONS IN WATER TABLE WELLS AND POTENTIALLY EXPOSED VEGETATION

ARCADIS

FIGURE 3

[MC-85 VJR] SANF-85 EGH
Project (RC000689.0002 Task 2)
Q:\PGETopock\GW_Risk\MXD\MaxDetectedCOPECs_v2.mxd - 5/28/2009 @ 1:12:22 PM

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi
Acting Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Arnold Schwarzenegger
Governor

MEMORANDUM

TO: Aaron Yue
Senior Hazardous Substances Engineer
Geology, Permitting and Corrective Action Branch
Department of Toxic Substances Control (DTSC)
Cypress, CA 90630

FROM: J. Michael Eichelberger, Ph.D. Brian Parker for JME
Staff Toxicologist
Human and Ecological Risk Division (HERD)

DATE: June 17, 2009

SUBJECT: RESPONSE TO COMMENTS, COMMENTS ON THE FEBRUARY DRAFT GROUNDWATER HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT, PACIFIC GAS AND ELECTRIC COMPANY, TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

PCA: 22120 SITE CODE: 540015-48 MPC: 44

Background

The PG&E Topock facility entered service in 1951 as a compressor station for pipelines delivering natural gas from production fields in the southwestern United States to the PG&E service area in Southern California. Facility operations include compression of natural gas, cooling of the natural gas and lubricating oil, wastewater treatment, and equipment and facility maintenance. Hexavalent chromium and later trivalent chromium were discharged to Bat Cave Wash and soil sampling has detected concentrations of trivalent chromium in excess of 3,300 mg/kg in the East Ravine soils. The following comments offered by HERD are in response to the PG&E response to comments to HERD comments regarding the February 2009 Groundwater Human Health and Ecological Risk Assessment. The comments below reflect only those directed at the

ecological portion of the report, specifically identified by PG&E as HERD-JME, as found on pages 5-8.

Document Reviewed

HERD reviewed "Response to comments, Comments Draft Groundwater Human Health and Ecological Risk assessment, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California." The report containing the responses was prepared by Arcadis (Walnut Creek, California) but is not dated. HERD received the report for review and comment in June.

Scope of the Review

The report was reviewed for scientific content related to ecological risk assessment. Grammatical or typographical errors that do not affect the interpretation of the text have not been noted.

General Comments

Page 6, PG&E Response to HERD General Comment, first paragraph. The request to consider evaluation of groundwater exposure pathways to upland and riparian phreatophytes is not new. HERD has discussed this with PG&E many times.

Page 6, PG&E Resoponse to HERD General Comment, third paragraph. HERD believes that PG&E has presented a sufficient argument for not including nitrate as a COPEC to plants based on the paper by McKeon *et al.*, 2006. However, an additional implication of the paper is the bioaccumulation of nitrate in the foliage (500 mg/kg). Nitrate toxicity to ruminants foraging on plants with high nitrate concentrations in the plant tissue is well documented:

http://www.algreatlakes.com/pdf/factsheets/ALGLFS04_Nitrate_Toxicity_in_Feed.PDF.

Nitrate is converted to nitrite by bacteria in the rumen. If sufficient nitrite is absorbed by the blood, the nitrite oxidizes the hemoglobin heme ferrous iron (Fe^{+2}) to ferric iron (Fe^{+3}). Hemoglobin containing ferric iron is known as methemogolobin and cannot bind oxygen, thus causing functional anemia. Oxygen cannot be delivered to tissue which subsequently becomes anoxic. Nelson's bighorn sheep (*Ovis Canadensis nelsoni*) are known to occur in the area of the Topock Gorge. Although the species may not normally range over the Topock Compressor Station site this pathway should be described in the Human Health and Ecological Risk Assessment (HHERC) with supporting evidence that significant exposure via this route is not significant or is *deminimus*.

Page 6, PG&E Response to HERD General Comment, fourth paragraph. The HHERC should be viewed as a stand alone document. Figure 2 should be imported from the Monitoring Report for the Floodplain Reductive

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Zone *In-Situ* Pilot Test to the HHERC. The table should be referenced in the text and the wells identified as relevant to phreatophyte exposure identified on the figure.

Page 8, PG&E Response to HERD General Comment, second paragraph. Please construct a table that shows the No Observable Adverse Effect Concentration (NOAEC), the background UTL, the maximum concentration and the hazard quotients. Since the PG&E Response to HERD Comments is material not discussed in the Draft HHERC, please include this paragraph as text in the Draft HHERC. This can be considered a global comment that applies to the entire Response to Comments.

Page 8, PG&E Response to HERD General Comment, bottom paragraph. Please construct a table containing the toxicity reference values, COPECs, background UTL and hazard quotients. Provide the complete references in the HHERC for the NOAECs. Although the Response to Comments identifies sources for the NOAECs in the text and annotates them, HERD did not see where the references were placed in the Response to Comments. Please provide the full references in the HHERC.

Conclusions

Many of the PG&E responses contain the information HERD requested. An evaluation of nitrate toxicity to ruminants should be presented in the HHERC. The text presented in the PG&E Response to Comments needs to be incorporated into the HHERC. Tables depicting maximum COPEC concentrations, background UTLs, NOAECs and hazard quotients should be constructed and inserted into the HHERC. After HERD's comments have been incorporated into the Draft HHERC the report should be resubmitted to HERD for review.

Reviewed by: Brian Faulkner, Ph.D.
Associate Toxicologist

Cc: Gerald a. Pollock, Ph.D., D.A.B.T
Senior Toxicologist

Carrie Marr
U.S. Fish and Wildlife Service
Environmental Contaminants
Arizona Ecological Services Field Office
2321 W Royal Palm Rd., Suite 103
Phoenix, Arizona 85021

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References

McKeon, C., E.P. Glenn, W.J. Waugh, C. Eastoe, F. Jordan, and S.G. Nelson. 2006. Growth and water and nitrate uptake patterns of grazed and ungrazed desert shrubs growing over a contamination plume. Journal of Arid Environments 64:1.21.

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Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi,
Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

TO: Aaron Yue
Project Manager
Department of Toxic Substances Control
Cypress, California

FROM: Shukla Roy-Semmen, Ph.D.
Staff Toxicologist
Human and Ecological Risk Division

DATE: June 15, 2009

SUBJECT: Review of PG&E's Response to Agency Comments on the Groundwater Risk Assessment, Topock Compressor Station, Needles, California.

PCA: 22120 Site Code: 540015-48

The Human and Ecological Risk Division (HERD) reviewed "Response to Comments, Comments on the February 2009 Draft Groundwater Human Health and Ecological Risk Assessment, Pacific Gas and Electric, Topock Compressor Station, Needles, California". The document was prepared by Arcadis, for the Pacific Gas and Electric Company (PG&E), and was submitted to DTSC for review on May 29, 2009. HERD found responses (to DTSC's comments) and clarification of various issues to be acceptable in all cases, except for responses to comments GC3, GC7, and GC10. Details are provided below.

Response to comments on HERD SRS GC3: PG&E states that "the GWRA does not make statements about proposing to cleanup to the California MCL for total chromium of 50 ug/L." HERD notes that there is an extensive discussion of remediation goals for hexavalent chromium in section 8 of the GWRA where it is stated that "This section presents groundwater remediation goals for those constituents identified in the risk characterization section of the quantitative HHRA"; "In accordance with the RAWP...drinking water criteria, in compliance with ARARs, are relevant remediation goals for all COCs where such criteria are available", and "Consistent with the RAWP, as an ARAR for hexavalent chromium (i.e., the California MCL of 50 ug/L for total chromium), the ARAR will be used in preference over risk-based criteria as the applicable drinking water criteria in the CMS/FS process". Individuals reviewing this section will get the impression that the MCL for total chromium is indeed being considered as the remediation goal (i.e., a cleanup goal) for hexavalent chromium. The response provided for GC4 would suffice in this case also. Please include similar language in this response as well.

Response to comments on HERD SRS GC7: Please remove all sections of this response, except for the first paragraph and last two paragraphs. It is not necessary to reiterate information already included in Appendix M, in the responses to comments document.

It should be noted that HERD contacted USEPA's IRIS hotline to inquire on the status of molybdenum toxicity value. The Toxicologist on duty at the IRIS hotline specifically stated that the existing RfDo for molybdenum is not being considered for revision at this time, and that IRIS is still recommending use of the RfDo listed on its website. The Toxicologist also mentioned that the USEPA takes no position on Institute of Medicine's tolerable upper intake level of 0.03 mg/kg/day. Moreover, this compound does not appear on IRIS Track, a list of substances that are currently being assessed for revision. HERD would also like to point out that the IRIS profile for molybdenum includes the following: "A screening-level review conducted by an EPA contractor of the more recent toxicology literature pertinent to the RfD for molybdenum conducted in August 2003 did not identify any critical new studies." Note that the IOM study was published in 2001.

Response to comments on HERD SRS GC10: HERD does not concur with the "in plume" vs. "out of plume" analyses presented in the GWRA, and recommends the use of well-by-well assessment (see HERD SRS GC9). Furthermore, as previously stated, the plume in question refers specifically to hexavalent chromium and not other COPCs. Although the COPCs may be originating from a common SWMU/AOC, one should not automatically assume that the size and shapes of these plumes will be identical to each other, or that hexavalent chromium plume is the perfect "tracer of flow" because the boundaries are defined by a statistical background value of 32 ug/l. Furthermore, the hexavalent chromium plume boundary is of the plume as it exists today, not of potential flow paths during discharge (based on communications with DTSC management).

Reviewed by:

Gerald A. Pollock, Ph.D., DABT
Senior Toxicologist
Human and Ecological Risk Division

Michelle Ruiz-Leeman
for "GAP"

Appendix S – Item 5

From: Meeks, Yvonne J [mailto:YJM1@PGE.COM]
Sent: Tuesday, July 07, 2009 6:11 PM
To: Karen Baker; Aaron Yue; Pamela_Innis@ios.doi.gov
Cc: Gilbert, David; Doss, Robert
Subject: Path forward on GWRA and CMS/FS per recent discussions

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Karen, Aaron, and Pam

Last week DTSC and PG&E discussed the management of additional constituents of concern in the Topock Groundwater Risk Assessment (GWRA) and the CMS/FS Report, as well as the schedule assumptions for incorporating East Ravine into the CMS/FS Report and reaching resolution on comments. The purpose of this email is to document our understanding of that discussion and make sure we are all on the same page as we move forward in finalizing the GWRA and the CMS/FS. While DOI representatives were not on the phone, Aaron indicated DTSC had discussed these topics with Pam, and that DOI is in general agreement with DTSC on the issues. Pam, please let us know if you have any feedback on, or any disagreement with, the direction that DTSC has provided as summarized below.

COCs in the Topock Groundwater Risk Assessment and CMS/FS

DTSC stated that the Topock GWRA should include PG&E's conclusions and recommendations including which chemicals PG&E's experts believe should be considered Chemicals of Concern (COCs) and which should get carried forward to the CMS/FS stage of the project. It is understood that the recommendations would be PG&E's recommendations and that DTSC may not agree with the recommendations (and could state that in a conditional approval). Specifically, consistent with the draft GWRA, PG&E may conclude that selenium, nitrate and molybdenum are not a source a significant risk, that these three chemicals are not drivers for groundwater remediation, do not need to be considered COCs, and thus do not need to get carried forward to the CMS/FS. PG&E may also consider modifying some of these conclusions.

DTSC agrees that selenium, nitrate and molybdenum do not represent significant risk at the site, and are expecting to approve these conclusions of the Topock GWRA. However, DTSC believes that selenium, nitrate and molybdenum need to be carried forward to the CMS/FS, and thus would provide a 'qualified' or conditional approval of the GWRA if the PG&E recommends that selenium, nitrate and molybdenum NOT get carried forward to the CMS/FS.

In carrying forward these three chemicals into the CMS/FS, DTSC stated that that selenium, nitrate and molybdenum do not need to be considered equivalent to Cr(VI). Specifically, DTSC indicated that there do not need to be any stated remedial action objectives for these three additional COCs and the alternatives do not need to be evaluated for attainment of a cleanup standard for these additional COCs. DTSC expects that the three COCs would be discussed in the upfront chapters of the CMS/FS report, with a general discussion of how these COCs do not pose a significant risk to human health or the environment, and are addressed in a global manner by all alternatives that focus on Cr(VI) remediation. DTSC expects that monitoring for these additional COCs would be performed to confirm these conclusions, and that these additional COCs would be evaluated in future characterization efforts (e.g., soil).

Schedule Assumptions for the CMS/FS Report

DTSC has looked at the assumptions in the June 17 RCRA/CERCLA meeting handout pertaining to incorporation of East Ravine data into the CMS/FS, and reaching resolution on comments on the CMS/FS report. DTSC is in agreement with all the assumptions, except that DTSC would like to clarify that the target remediation area for Cr(VI) in the East Ravine is considered to be 32 ppb because this is below the risk-based concentration of 46 ppb, not because it is background. While noting that there is no established background value for Cr(VI) in bedrock, DTSC does not see value in establishing a background value since the proposed cleanup value is less than the risk-based concentration.

Yvonne pointed out that there is no documentation of the agency direction to deviate from the existing schedule by including the East Ravine into the current CMS/FS. To document the agreement on the revised schedule, Aaron sent an email to Yvonne on July 2. In response to Aaron's email, PG&E will update the June 17 RCRA/CERCLA meeting handout dates and assumptions after further adjustments are made to the Rainbow Schedule based on inputs from both DTSC and DOI. This update will serve as the agreed on CMS/FS schedule. At this time, due to the continuing development of aspects beyond the CMS/FS Report such as the PA and the EIR, DTSC is not inclined to publish the next official version of the Project Schedule at the July 15 CWG.

Appendix S – Item 6

From: "Aaron Yue" <AYue@dtsc.ca.gov>
To: <Pamela_Innis@ios.doi.gov>, "Yvonne J Meeks" <YJM1@PGE.COM>
Cc: "Karen Baker" <KBaker@dtsc.ca.gov>, "David Gilbert" <DAG6@PGE.COM>, "Robert Doss" <RLDl@PGE.COM>
Date: 07/08/2009 11:45 AM
Subject: Re: Path forward on GWRA and CMS/FS per recent discussions

---

Yvonne, there are some minor but fundamental differences between our thinking and as memorialized in your email. Please see my edits in red below.

COCs in the Topock Groundwater Risk Assessment and CMS/FS

DTSC stated that the Topock GWRA may include PG&E's <strike out: conclusions and> recommendations on which chemicals PG&E's experts believe should be considered Chemicals of Concern (COCs) and which should get carried forward to the CMS/FS stage of the project. It is understood that the recommendations would be PG&E's recommendations and that DTSC may not agree with the recommendations (and could state that in a conditional approval). Specifically, consistent with the draft GWRA, PG&E may recommend that selenium, nitrate and molybdenum are not a source and of significant risk, that these three chemicals are not drivers for groundwater remediation, do not need to be considered COCs, and thus do not need to get carried forward to the CMS/FS. PG&E may also consider modifying some of these conclusions.

DTSC agrees that selenium, nitrate and molybdenum do not represent significant risk at the site, and are expecting to approve the risk numbers as calculated in the Topock GWRA. However, DTSC believes that selenium, nitrate and molybdenum need to be carried forward to the CMS/FS due to several wells having hazard index greater than 1 for the individual COC and that neither site wide COPCs in soil nor the cumulative risks between soil and groundwater have been studied at this point. DTSC would provide a 'qualified' <strike out: or conditional> approval of the GWRA and will specifically disagree with the recommendation if PG&E recommends that selenium, nitrate and molybdenum NOT get carried forward to the CMS/FS.

In carrying forward these three chemicals into the CMS/FS, DTSC stated that selenium, nitrate and molybdenum do not need to be considered equivalent to Cr(VI) in the evaluation effort. Specifically, DTSC indicated that there do not need to be any stated numeric remedial action objectives for these three additional COCs and the alternatives do not need to be evaluated for attainment of a cleanup standard for these additional COCs. DTSC expects that the three COCs would be discussed in the upfront chapters of the CMS/FS report, with a general discussion of the conservative nature and uncertainties associated with the risks as calculated in the GWRA and <strike out: how these COCs do not pose a significant risk to human health or the environment, and> are addressed in a global manner by all alternatives that focus on Cr(VI) remediation. DTSC expects that monitoring for these additional COCs would be performed to confirm these conclusions, and that these additional COCs would be evaluated in future characterization efforts (e.g., soil).

Schedule Assumptions for the CMS/FS Report

DTSC has looked at the assumptions in the June 17 RCRA/CERCLA meeting handout pertaining to incorporation of East Ravine data into the CMS/FS, and reaching resolution on comments on the CMS/FS report. DTSC is in agreement with all the assumptions, except that DTSC would like to clarify that the target remediation area for Cr(VI) in the East Ravine is considered to be 32 ppb because this is below the risk-based concentration of 46 ppb, not because it is background. While noting that there is no established background value for Cr(VI) in bedrock, DTSC does not see value in establishing a background value at this time since the proposed cleanup value is less than the risk-based concentration for oral non-cancer affects from Cr(VI).

Yvonne pointed out that there is no documentation of the agency direction to deviate from the existing schedule by including the East Ravine into the current CMS/FS. To document the agreement on the revised schedule, Aaron sent an email to Yvonne on July 2. In response to Aaron's email, PG&E will update the June 17 RCRA/CERCLA meeting handout dates and assumptions after further adjustments are made to the Rainbow Schedule based on inputs from both DTSC and DOI. This update will serve as the agreed on CMS/FS schedule. At this time, due to the continuing development of aspects beyond the CMS/FS Report such as the PA and the EIR, DTSC is not inclined to publish the next official version of the Project Schedule at the July 15 CWG.

Appendix S – Item 7

From: Meeks, Yvonne J [YJM1@PGE.COM]
Sent: Monday, July 13, 2009 2:02 PM
To: Pamela_Innis@ios.doi.gov; Aaron Yue; Karen Baker
Cc: Gilbert, David; Doss, Robert
Subject: RE: Path forward on GWRA and CMS/FS per recent discussions

---

Thanks Aaron for your clarification of DTSC direction. This will help ensure we produce work product that meets agency expectations.

Pam -- We do not specifically need anything from DOI re: path forward email. That email (and Aaron's edits) documents DTSC direction to PGE on the GWRA and CMS. We will be proceeding per that DTSC direction in finalizing those documents and will let the CWG know that approach in our upcoming CMS/RA presentations this week. I just wanted to make sure you were aware and had a chance for any feedback, especially if there was any disagreement before the CWG presentations. If not, we're good to go and will proceed as directed by DTSC.

Yvonne

From: Pamela_Innis@ios.doi.gov [mailto:Pamela_Innis@ios.doi.gov]
Sent: Friday, July 10, 2009 11:44 AM
To: Meeks, Yvonne J
Cc: Gilbert, David; Doss, Robert
Subject: Re: Path forward on GWRA and CMS/FS per recent discussions

---

I would like clarification as to what you are expecting from DOI on the below e-mail. The information is reflective of discussions in the RCRA/CERCLA meeting but not unlike comments that are contained within the RTCs that are currently on the street for both the GWRA and the CMS/FS and revisions that will occur to both documents.

Pamela S. Innis
DOI Topock Remedial Project Manager
Office of Environmental Policy and Compliance
U.S. Department of Interior
P.O. Box 25007 (D-108)
Denver, CO 80225-0007
Voice: 303.445.2502
Fax: 303.445.6320
Cell: 303.501.5685

From: "Aaron Yue" <AYue@dtsc.ca.gov>

To: <Pamela_Innis@ios.doi.gov>, "Yvonne J Meeks" <YJM1@PGE.COM>

Cc: "Karen Baker" <KBaker@dtsc.ca.gov>, "David Gilbert" <DAG6@PGE.COM>, "Robert Doss" <RLDl@PGE.COM>

Date: 07/08/2009 11:45 AM

Subject: Re: Path forward on GWRA and CMS/FS per recent discussions

---

Yvonne, there are some minor but fundamental differences between our thinking and as memorialized in your email. Please see my edits in red below.

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DTSC agrees that selenium, nitrate and molybdenum do not represent significant risk at the site, and are expecting to approve the risk numbers as calculated in the Topock GWRA. However, DTSC believes that selenium, nitrate and molybdenum need to be carried forward to the CMS/FS due to several wells having hazard index greater than 1 for the individual COC and that neither site wide COPCs in soil nor the cumulative risks between soil and groundwater have been studied at this point. DTSC would provide a 'qualified' <strike out: or conditional> approval of the GWRA and will specifically disagree with the recommendation if PG&E recommends that selenium, nitrate and molybdenum NOT get carried forward to the CMS/FS.

In carrying forward these three chemicals into the CMS/FS, DTSC stated that selenium, nitrate and molybdenum do not need to be considered equivalent to Cr(VI) in the evaluation effort. Specifically, DTSC indicated that there do not need to be any stated numeric remedial action objectives for these three additional COCs and the alternatives do not need to be evaluated for attainment of a cleanup standard for these additional COCs. DTSC expects that the three COCs would be discussed in the upfront chapters of the CMS/FS report, with a general discussion of the conservative nature and uncertainties associated with the risks as calculated in the GWRA and <strike out: how these COCs do not pose a significant risk to human health or the environment, and> are addressed in a global manner by all alternatives that focus on Cr(VI) remediation. DTSC expects that monitoring for these additional COCs would be performed to confirm these conclusions, and that these additional COCs would be evaluated in future characterization efforts (e.g., soil).

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Appendix S – Item 8

From: Meeks, Yvonne J
Sent: Thursday, July 16, 2009 12:01 PM
To: 'Aaron Yue'; 'Karen Baker'
Cc: Gilbert, David; Kellogg, Lisa; Doss, Robert
Subject: Path forward on GWRA RTC per recent discussions

Dear Aaron,

As a follow up from our July 2nd 2009 conference call and subsequent emails below documenting the discussions between DTSC and PG&E regarding the path forward for the GWRA and the CMS/FS, PG&E has reviewed the following documents to identify any material inconsistencies between what was originally presented in these documents and our subsequent discussions/emails on the path forward for the GWRA and the CMS/FS:

1) Memo from Shukla Roy-Semmen, Staff Toxicologist, Human and Ecological Risk Division (HERD), Review of a Groundwater Huyman Health Risk Assessment for the PG&E Topock Compressor Station Located in Needles, Claifornia, dated March 26, 2009.

2) *Response to Comments (RTCs), Comments on the February 2009 Draft Groundwater Human Health and Ecological Risk Assessment*, submitted to stakeholders on May 29, 2009;

3) Memo from Shukla Roy Semmen, Staff Toxicologist, Human and Ecological Risk Division (HERD), Review *of PG&E's Response to Agency Comments on the Groundwater Risk Assessment, Topock Compressor Station, Needles, California,* dated June 15, 2009;

4) Memo from J. Michael Eichelberger, Staff Toxicologist, HERD, Response to Comments, *Comments on the February Draft Groundwater Human Health and Ecological Risk Assessment, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California,* dated June 17, 2009 (no issues that need to be resolved before receiving the final comments).

In our review of these documents, there are two items that appear to be inconsistent with the direction provided by DTSC during the July 2nd conference call which we would like to highlight to you before you transmit final DTSC comments on the GWRA RTCs. Each of these items is discussed below.

Molybdenum

The original written direction provided by DTSC in March 2009 (item 1 above) was to remove all discussions surrounding the essential nutrient evaluation of molybdenum from the main text of the GWRA and include the essential nutrient evaluation as an Appendix to the GWRA (General Comment 7). Specifically, based on our conversations with DTSC in March 2009, and our understanding of the specific direction being provided by DTSC, PG&E stated the following in the May 2009 RTCs: "Per DTSC's request, the GWRA will be revised to present conclusions for molybdenum as a COC based solely on this evaluation [using the USEPA IRIS oral reference dose approach] and the main text of the GWRA will remove the discussions related to the essential nutrient evaluation."

Based on the subsequent discussions between DTSC and PG&E on July 2, 2009, and our understanding that DTSC accepts that the technical evaluations and recommendations of the GWRA would be PG&E's evaluations and recommendations (and that DTSC may not agree with all aspects of PG&E's recommendations), PG&E is proposing to keep the technical evaluations of molybdenum as currently presented in the Draft GWRA. We raise this issue to DTSC's attention before finalization of additional comments (item 3 above) because the direction in HERD's June 15, 2009 written comments differ from understanding reached during recent discussions between PG&E and DTSC. In the June 15, 2009 memo prepared by HERD, submitted to PG&E by DTSC in Draft form on June 29, 2009, HERD is requesting (under Response to comments on HERD SRS GC7) modifications to our original response, asking that PG&E remove much of the text presented in our May 29, 2009 response to HERD SRS GC7. We would like your concurrence that our proposal to keep the technical molybdenum evaluation as currently presented in the Draft GWRA is consistent with the overall theme of our discussions on July 2. Specifically, because the GWRA is a PG&E document, the GWRA can present PG&E's technical evaluations and recommendations.

Process for Moving Forward and Submitting Revised GWRA

Based on the June 15, 2009 memo prepared by HERD (item number 3 above), it appears that HERD is requesting that the RTCs, submitted to the agencies on May 29, 2009, be revised and re-submitted for agency review. With respect to HERD's June 15, 2009 memo (item 3 above), it would seem that re-submittal of the RTCs may not be a necessary step to ensuring that the revised GWRA meets agency expectations. Specifically, as requested by HERD, PG&E agrees to incorporate the response provided to GC4 to GC3 (in item 2 above), and to clarify throughout the revised GWRA that the risk assessment does not determine the ultimate level of remediation that needs to occur at the site, but rather that discussions about the remedial action objectives and decisions regarding the final remedial goals will be determined in the CMS/FS. Further, the revised GWRA will address the topics as described in the call summary for the July 2 discussion (previously submitted separately).

We propose that this letter, the associated supporting documents identified herein, and your upcoming cover letter transmitting the finalized comments (re item 3 above), serve as adequate documentation of the discussions, agreements, and resolution to key issues between PG&E and DTSC regarding the comments and responses for the Draft GWRA. PG&E would appreciate input and/or concurrence from DTSC on this recommended path forward for submittal of the revised GWRA, and ideas as to how PG&E can help facilitate the process. We will plan to implement these agreements and resolutions in the revised or redline, at your direction) GWRA once we receive your final input.

Thanks Aaron. We do appreciate DTSC's willingness to work efficiently and openly with PG&E in order to maintain focus and maintain the current schedule.

Yvonne

From: Meeks, Yvonne J
Sent: Monday, July 13, 2009 3:01 PM
To: 'Aaron Yue'; 'Karen Baker'
Cc: Gilbert, David; Kellogg, Lisa
Subject: Path forward on GWRA RTC per recent discussions

Aaron and Karen -- As our RAers have been reviewing the GWRA RTC correspondance to date with respect to DTSC/PGE recent telecon and the email summary below, they are noting that there are some discrepencies (e.g., Shukla's comments say to change specific text, while July 2 direction was that the GWRA is a PG&E document and that we can include our language regarding our recommendations). We hope to finish this comparison and provide more detail to you in the next day or so, for your consideration in preparing DTSC's final letter with direction on incorporating the RTC into the revised GWRA.

Thank you, Yvonne

Item 7

From: Meeks, Yvonne J
Sent: Monday, July 13, 2009 11:02 AM
To: Pamela_Innis@ios.doi.gov; Aaron Yue; Karen Baker
Cc: Gilbert, David; Doss, Robert
Subject: RE: Path forward on GWRA and CMS/FS per recent discussions

---

Thanks Aaron for your clarification of DTSC direction. This will help ensure we produce work product that meets agency expectations.

Pam -- We do not specifically need anything from DOI re: path forward email. That email (and Aaron's edits) documents DTSC direction to PGE on the GWRA and CMS. We will be proceeding per that DTSC direction in finalizing those documents and will let the CWG know that approach in our upcoming CMS/RA presentations this week. I just wanted to make sure you were aware and had a chance for any feedback, especially if there was any disagreement before the CWG presentations. If not, we're good to go and will proceed as directed by DTSC.

Yvonne

From: Pamela_Innis@ios.doi.gov [mailto:Pamela_Innis@ios.doi.gov]
Sent: Friday, July 10, 2009 11:44 AM
To: Meeks, Yvonne J
Cc: Gilbert, David; Doss, Robert
Subject: Re: Path forward on GWRA and CMS/FS per recent discussions

---

I would like clarification as to what you are expecting from DOI on the below e-mail. The information is reflective of discussions in the RCRA/CERCLA meeting but not unlike comments that are contained within the RTCs that are currently on the street for both the GWRA and the CMS/FS and revisions that will occur to both documents.

Pamela S. Innis
DOI Topock Remedial Project Manager
Office of Environmental Policy and Compliance
U.S. Department of Interior
P.O. Box 25007 (D-108)
Denver, CO 80225-0007
Voice: 303.445.2502
Fax: 303.445.6320
Cell: 303.501.5685

Appendix S – Item 9

From: Aaron Yue [mailto:AYue@dtsc.ca.gov]
Sent: Thursday, July 16, 2009 4:53 PM
To: Kellogg, Lisa; Christina.Hong@CH2M.com; Bob Doss; Yvonne J Meeks
Cc: Michael Sullivan; Christopher Guerre; James Eichelberger; Karen Baker; Nancy Long; Shukla Roy-Semmen; NoraMcDowell-Antone@fortmojave.com; Pam Innis
Subject: PG&E: Comments on the proposed GWRA response to comments (RTC) package

---

Greetings,

Attached are the responses to the RTC package from within DTSC and from the Fort Mojave Indian Tribe (FMIT). On June 10, 2009 DTSC forwarded PG&E's proposed RTC on the draft Groundwater Human Health and Ecological Risk Assessment (GWRA) to the parties that have provided original comments for review. Of all the external parties that provided original comments (including MWD, CRIT, DOI and FMIT), DTSC only received additional response from Dr. Michael Sullivan representing FMIT on July 10, 2009 and a separate letter dated July 13, 2009 from Chairman Williams to Mr. Maziar Movassaghi of DTSC and Dr. Willie R. Taylor of DOI. Pursuant to the July 14, 2009 email request by Ms. Nora McDowell-Antone, DTSC is also forwarding the July 13 letter to you as record of their comments.

With respect to the FMIT comments from Dr. Michael Sullivan, DTSC believes that PG&E can further refine the proposed RTCs to address the concerns raised. DTSC, however, has the following position to be incorporated to your RTCs.

FMIT GC1: Although the documents for the Groundwater Risk Assessment (GWRA) and the CMS/FS are produced on a parallel track, agencies and PG&E agree that the GWRA should be completed so that the conclusion of the GWRA is properly reflected in the CMS/FS for evaluation. Please note that in practice, the GWRA is being completed before the CMS/FS.

FMIT GC3 and GC4: DTSC believes that the language from the RFI/RI Volume 2 provides a broad view that captures the cultural sensitivities of the area. Statement that "portions of the site have been disturbed by construction and unsympathetic land use..." suggests impacts that are either outside the control of the current project or that there are unmitigated impacts as a result of agency activities. DTSC maintains that this FMIT view should be captured in the upcoming Environmental Impact Report where impacts can be fully discussed and analyzed.

With respect to the letter from Chairman Williams, DTSC will be preparing a separate response to the letter. DTSC will clarify that land use decisions are the responsibility of the land owner. In this case, the Department of Interior issued a Final Land Use Memorandum on October 5, 2007 detailing the land use assumptions to be used for the risk assessment and the development of remedial alternatives at the project area. DTSC will defer any decisions on the proposed land use to the DOI.

Aside from these specific statements, DTSC directs PG&E to provide responses to all comments attached. If you have any questions regarding this matter, please feel free to contact me.

Sincerely,

Aaron Yue
Senior Hazardous Substances Engineer
Geological Services Branch
Cypress, California

GWRA memo-Final-HERD.pdf	Topock JME 06-17-2009.pdf	Sullivan letter on response to GWRA cc	FMIT Ltr to Movassaghi Taylor 7-
Item 3	Item 2	Item 9a	Item 9b

July 10, 2009

Mr. Aaron Yue, Project Manager
DEPARTMENT OF TOXIC SUBSTANCES CONTROL
5796 Corporate Avenue
Cypress, California 90630

Ms. Pamela S. Innis
Topock Remedial Project Manager
Office of Environmental Policy and Compliance
U.S. DEPARTMENT OF THE INTERIOR
P.O. Box 25007 (D-108)
Denver, Colorado 80225-007

Re: Response to Pacific Gas and Electric Company Response to Comments on draft Groundwater Risk Assessment for Topock Compressor Station, Needles, California.

Dear Mr. Yue and Ms. Innis:

On March 20, 2009, I submitted a comment letter on behalf of the Fort Mojave Indian Tribe (The Tribe, FMIT) summarizing my review of the Pacific Gas and Electric Company's (PG&E) February 9, 2009, draft document titled, *Groundwater Human Health and Ecological Risk Assessment for Chromium* (GWRA) for the Topock Compressor Station, Needles, California. My comments focused on overarching issues which are of great importance to the Tribe. On May 29, 2009, a draft response to comments was sent out by Lisa Kellogg of Arcadis on behalf of PG&E. This letter addresses the responses to the Tribe's General Comment (GC) 1 through GC 5 by Arcadis/PG&E. While specific issues are listed below, the proposed responses to the Tribe's issues are insufficient and do not address the Tribe's concerns. The GWRA must be updated to address these Tribal issues by editing and/or adding provided language. It is the responsibility of your agencies as the lead regulatory agencies to require PG&E and its consultants to properly address stakeholder comments. Will DTSC and the US Department of Interior (DOI) require PG&E to address our comments by revising the risk assessment?

FMIT GC1 – The response simply refers to the project schedule. CERCLA and RCRA documents should follow a logical order: characterization, risk assessment, remediation feasibility and then remediation implementation. When documents are prepared and provided out of sequence, however, the review process is disrupted. For example, the groundwater FS should not be completed until the GWRA is finalized. An additional concern is that the illogical order of reports may have resulted in an agency recommendation to address Tribal comments in some future report but not the

appropriate update of the reviewed report. This just perpetuates erroneous assumptions and faulty text. It is DTSC's responsibility as the lead regulatory agency to ensure that documents are provided in the correct order and with sufficient time for meaningful comment. DOI comment SC 16 reiterates the basic premise of our position that the documents must be presented in a comprehensive format and appropriate order so that full reviews can be completed. Additionally, the response to DOI comment SC 7 (among others) suggests that updates to the GWRA will only be evaluated in an addendum and not as an updated GWRA. The complete GWRA must be reissued so that reviewers have a complete and comprehensive document to review rather than multiple documents.

FMIT GC2 – The intent of my comment was to have the GWRA, and all subsequent reports, contain language that describes and acknowledges the significance of the local ecosystem (both river and upland areas) as well as the unique and significant relationship between Tribal culture and the environment. Neither the original text nor the suggested edits accurately addresses this important issue. DOI's comment SC 11 reiterates the Tribe's concerns regarding the inappropriate description of the desert environment. We request that PG&E provide the entire updated text from this section so the entire text can be reviewed with the added sentences.

FMIT GC3 – The response to comments does not fully address the Tribe's position that the land, the Maze, the River, etc. (all the inter-related areas of the landscape) are significant, sacred and all tied intimately to the Tribe's culture. DTSC must insist that the GWRA and future documents include the recommended language provided by the Tribe. Risk managers need to have full and accurate descriptions of the Tribal interests in the site and surrounding land in order to make appropriate remediation decisions. DOI comment SC 12 also notes that the GWRA's references to Tribal areas are incomplete or inaccurate. Why do DTSC and PG&E continue to refuse to include text provided by the Tribe? It is the Tribe's view that this text should be included in <u>all</u> project reports.

FMIT GC4 – The response to comments addresses many of the issues raised in my comments but does not propose to update the text to include the description of the Tribe's future interests in the IM3 and Topock compressor sites. DTSC must insist that the GWRA and future documents include recommended language provided by the Tribe. Risk managers need to have full and accurate descriptions of the Tribal interests in the site and surrounding land in order to make appropriate remediation decisions. Why do DTSC and PG&E continue to refuse to include text provided by the Tribe? It is the Tribe's view that this text should be included in <u>all</u> project reports. It is further interesting that in comment SC 4, DOI requests removal of any reference to its request for evaluating potential future residential development. If the basis for the inclusion of the residential receptor was based on the DOI request, then DOI's withdrawal of its comment should

result in the exclusion of the residential receptor. This DOI position seems to be further stated in its comment SC 13 where it cites the appropriate criteria to be used in selecting future land and resource (i.e., groundwater) uses. What is the rationale for not honoring DOI's request to remove the residential receptor?

It is disappointing to both the Tribe and its technical team that significant and focused comments are provided on draft documents yet PG&E and its consultants have dismissed these comments by not responding with appropriate document changes. As in the past, I remain available to work with PG&E on text updates to the GWRA and future documents to ensure that the reports adequately address Tribal issues. I can be contacted at michael.sullivan@csun.edu. I believe that the project can achieve the objective of sufficient characterization, risk estimation and remediation while also protecting the land from further unnecessary disturbances.

Sincerely,

Michael J. Sullivan, Ph.D., CIH

cc: Nora McDowell/Fort Mojave Indian Tribe
Luke Johnson/Fort Mojave Indian Tribe
Linda Otero/Fort Mojave Indian Tribe
Courtney Ann Coyle/Tribal Co-Counsel
Steven P. McDonald/Tribal Co-Counsel
Yvonne Meeks/PG&E
Leo Leonhart/Hargis+Associates

Fort Mojave Indian Tribe

TIMOTHY WILLIAMS - Chairman
SHAN LEWIS - Vice-Chairman
COLLEEN GARCIA - Secretary
MARTHA McCORD - Council Member • NICHOLE GARCIA - Council Member
LINDA OTERO - Council Member • NORVIN McCORD SR. - Council Member
500 Merriman Avenue • Needles, CA 92363
(760) 629-4591 • FAX (760) 629-5767

July 13, 2009

VIA FACSIMILE

Mr. Maziar Movassaghi, Acting Director
DEPARTMENT OF TOXIC SUBSTANCES CONTROL
1001 I Street
P.O. Box 806
Sacramento, CA 95812-0806

Dr. Willie R. Taylor, Director
Office of Environmental Policy and Compliance
U.S. DEPARTMENT OF THE INTERIOR
P.O. Box 25007 (D-108)
Denver, Colorado 80225-007

Re: Fort Mojave Indian Tribe follow-up letter to March 20, 2009, comment letter on Pacific Gas and Electric Company draft Groundwater Risk Assessment for Topock Compressor Station, Needles, California.

Dear Mr. Movassaghi and Dr. Taylor:

On March 20, 2009, Dr. Michael J. Sullivan submitted a comment letter to you on behalf of the Fort Mojave Indian Tribe (the Tribe) regarding the Pacific Gas and Electric Company's (PG&E) February 9, 2009, draft document titled, *Groundwater Human Health and Ecological Risk Assessment for Chromium* (GWRA) for the Topock Compressor Station, Needles, California. In his General Comment CG4, Dr. Sullivan discussed the need for clarification of future land uses in the vicinity of the Topock Compressor Station Site. Accordingly, I am writing this letter to clarify the Tribe's view as to what constitutes appropriate land uses for this area and to further express the Tribe's serious concerns regarding the appropriate use of DOI-managed land in the area.[1] Moreover, I wish to point out some inconsistencies in DOI's recent programs involving management of the land in this culturally sensitive area.

[1] Dr. Sullivan noted in his March 20 letter that the Tribe would send a separate letter for this purpose. General Comment CG4 provides:

> *There are future land-use issues in the GWRA that need to be clarified. First, DOI has requested that a stretch of the floodplain area along old Route 66 be evaluated for potential future scenario* [sic] *involving the development of housing and recreational areas (pg 2-6, pp. 5). This results in the risk assessment assumption of future residence use of groundwater produced from local wells.*

Appropriate Land Uses

In particular, the Tribe's concerns regarding the land uses in the vicinity of the Topock Compressor Station Site and surrounding area were triggered by the text in Section 2.3.2 ("Future Land Use") of the draft GWRA and the graphic presented as Figure 2-5.[2] In that section of the draft GWRA, DOI proposed evaluating the development of housing and recreational areas as an appropriate future use for the Topock area. The Tribe's concerns were exacerbated by the recent facility construction within the nearby Pirate Cove Marina (including the vulgar-named "Naked Pirate Beach Bar"). The new construction at this site is quite visible from the cultural sites and seriously interferes with the sanctity of the sacred landscape. The operational impacts of the expanded recreational facility includes increased traffic and noise, off-road tours, opportunistic off-road excursion into sensitive areas, website exposure of sensitive areas, and vehicular parking outside designated areas. These impacts only further aggravate an already undesirable situation. Within the first weeks of operation of the Naked Pirate Beach Bar, there have already been direct and indirect impacts to the Tribe's nearby cultural sites that have been extremely hurtful and demoralizing to tribal practitioners. Considering the assumptions regarding future land use in the GWRA, the Tribe is becoming increasingly concerned with other projects that the DOI may promote in the future, particularly in light of future land-use assumptions suggested for the GWRA.

While overall this concern extends beyond the scope of the GWRA, the Tribe believes that it must be spoken to and addressed now. The fact that in previous Topock Project documents presented for Tribal and public review, such as the RFI/RI Volume 2, similar language has been presented regarding future land uses and, despite the Tribe's appeals for the need to focus and clarify such language with regard to cultural preservation, it seems that the issue has strategically and consistently been ignored or put off to some unspecified future consideration. When such concerns have been raised by the Tribe during Topock Technical Review Group (TWG) and Consultative Working Group (CWG) meetings, the Tribe was given explanations to

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> *This proposed future land use scenario poses Tribal concerns, especially if such development were to occur in the vicinity of the Maze.* ***In a separate letter, the Tribe will provide text that describes appropriate land uses for this area.***
>
> *Second, the future ownership of the IM land as well as the potential repatriation of the Topock Compressor site to the Tribe is not mentioned. The potential for future control of these lands by the Tribe further increases the importance of current Tribal concerns regarding protecting the land as well as defining future land uses that should be evaluated in the GWRA.* [Emphasis added].

[2] The Tribe notes that the "Anticipated Future Land Use" graphic in the GWRA was not of sufficient scale or detail to understand fully the magnitude of DOI's proposed future land uses in the Topock area. For example, where would the "new pull-through recreational vehicle camping sites and tent camping areas" be found on the map? The Tribe requests a larger area be shown on map, along with an indication in separate zones of potential residential, recreational, and unrestricted uses on DOI-managed land with an overlay of management designations, such as ACEC, refuge, etc. The zones' uses should also be defined (*e.g.*, what does "unrestricted use" mean?).

the effect that such cultural issues were being deferred in favor of addressing them in the context of the Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA).

Deferring the Tribe's concerns about land use and its cultural resources is neither reasonable nor acceptable. Each step in this process has further whittled away at the remnants of what once was undisputedly (and what we still hold as) our Tribal landscape, the essence of our cultural and religious beliefs. Looking forward, the land uses as viewed by DOI trigger what the Tribe believes are unnecessarily high remediation standards causing otherwise avoidable disruptions. The Tribe is concerned that such assumptions will further adversely impact its precious cultural resources and religious values. A consistent application of risk assumptions made in soil, groundwater, and any other risk assessment attendant to the Topock Project must be maintained. Because its interests cannot be adequately represented by DTSC or DOI in this process, the Tribe must be given the opportunity to participate in the decision making process whereby such assumptions are identified and agreed upon.

Land Use Consistency with Adopted Management Plans and Policies

The mission statement of DOI's Bureau of Land Management (BLM) itself asserts its responsibility for:

> *"... **stewardship of our public lands**. The BLM is committed to manage, **protect** and improve these lands in a manner to serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife habitat, wilderness, air and scenic quality, as well as scientific and **cultural values**."*[3] [Emphasis added].

While the Tribe understands the concept of multiple use, we question how the future use assumptions in the GWRA would be consistent with BLM's concurrent responsibilities to protect cultural values, when the proposed use and the protection of cultural values already present are mutually exclusive. How is DOI's proposed land use therefore consistent with BLM's mission as a whole?

It also seems inappropriate for DOI to be asserting a particular land use, such as residential, when such uses may directly or indirectly conflict with its own recently adopted management plans and policies. The GWRA failed to reference or analyze these DOI planning and guidance documents which direct or influence the land uses in this area. Without including such an analysis in the GWRA, use of the proposed DOI land uses in the GWRA is unjustifiable.

[3] Available at http://www.nv.blm.gov/wilderness/WSA_mission_statement.pdf.

In 2005, the U.S. Bureau of Reclamation (BOR), another DOI agency, and other cooperators completed a document titled *Lower Colorado River Multi-Species Conservation Plan* (the Plan). The Plan represents a comprehensive species conservation approach for both Federal and non-Federal actions on the Lower Colorado River. All participating DOI officials were directed to cooperate and implement such agreements to achieve the important species conservation actions identified within the Plan.[4]

In the amendments to the *Lake Havasu Field Office Resource Management Plan and Final Environmental Impact Statement* (RMP), the Tribe worked closely with BLM to identify the Beale Slough Riparian and Cultural Area as an Area of Critical Environmental Concern (ACEC), which includes the current cleanup project area. In that document, BLM stated:

> [L]and use allocations and management . . . will provide protection for the Topock Maze and surrounding lands that are sacred to the Fort Mojave Indian Tribe. BLM will ensure that the Tribe is consulted on proposed actions that could affect those lands.[5]

The Beale Slough ACEC Management Plan has not yet been developed and is an important management tool that BLM must begin drafting as soon as possible, in close consultation with the Tribe. The Tribe would like to know the schedule for preparation and completion of this management plan as it relates directly to Topock remediation activities currently under consideration. But even without this management plan, BLM is obligated to protect the Topock area in a manner consistent with the adopted RMP, which provides for more than just consistency with recreational goals. How are DOI's proposed land uses consistent with the RMP in general, and the ACEC in particular? If the land uses are not consistent with adopted plans, they should not form the basis for risk assumptions in the GWRA. The Tribe hereby requests to see a map of the specific areas that might be "disposed" of by DOI, as referred to in the GWRA.

The Lake Havasu Resource Management Plan identified Topock-Needles as a conservation area with 1,127 acres set aside for "future use and traditional use." The document also recognized Special Cultural Resource Management Areas (SCRMA), the Chemehuevi Mountains Wilderness Area, Wildlife Habitat Management Areas, Desert Tortoise Habitat, and Biological Resources Management-Conservation Measures applicable to the Lake Havasu Field Office planning area.[6] The proposed future land uses discussed in the GWRA are inconsistent with the Lake Havasu Resource Management Plan. Only those future uses consistent with the Resource Management Plan should be evaluated.

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[4] This statement comes from sections contained in the Comment No. 1 of the Conservation Plan, specifically, "Description of Alternatives." Table 2-4 Cultural Resource Management- Land Use Allocation pg. 2-17. Table 2-5 Cultural Resource Management – Management Actions pg. 2-19 SCRMAs. Table 2-43. Area of Critical Environmental Concern – Land Use Allocations Beale Slough Riparian and Cultural ACEC pgs. 2-154 – 2-155.

[5] PRMP/RMP FEIS pg. 5-59.

[6] *Id.*

It is the responsibility of the agencies to implement management plans in the best interests of all affected parties, including the Tribe. Presenting plans that assume DOI's relinquishing control of its property, prior to any discussion or consultation with affected stakeholders, is inconsistent with this charge. Instead, DOI should uphold its commitment to protect the area's resources. Moreover, DOI again appears to be acting inconsistently with its own adopted plans and with federal policy and Executive Orders[7] requiring government-to-government consultation.

Conclusions and Requests for Further Action

It is the Tribe's view that DOI must follow its own policies and plans for the Topock area, and not open up this area for additional recreational or new commercial or residential infrastructure, even in a theoretical context. These types of infrastructure would be inconsistent with the cultural resources and tribal values associated with the area. Such problems further complicate remedial action decisions because they could result in a determination of the need for a higher level of clean-up than necessary, and thereby result in further desecration of this sacred area in violation of tribal beliefs.

Given that it is the Tribe's ultimate responsibility to protect and safeguard this sacred and culturally sensitive area, it is incumbent on the DOI to assure the Tribe's participation in current and future decisions involving proposed undertakings or land disposal considerations in the area. The Tribe's concerns for the Topock area extend well beyond the avoidance of visual impacts from the Maze features, as suggested in the GWRA language. The Tribe's concerns encompass both direct and indirect intrusions, to the cumulative impacts of diverse actions, and to the need for decision makers to consider an appropriate range of alternatives for any development in the area. **Through this letter, the Tribe requests a face-to-face meeting with DOI and its subordinate agencies, including the BLM and BOR, to discuss these concerns further.**

Finally, because this land is ancestral property, **the Tribe should be given a first right to repatriate the land prior to any offering of the land to any other entity for use, lease, or purchase.** It is also worth noting that, under Tribal ownership, allowable land uses or risks to human health and the environment may be different, and lesser intrusive remedial options might become available.

In sum, from the Tribe's viewpoint, appropriate land uses for the area include Mojave tribal ownership or federal ownership as protected open space, without additional active recreation or commercial operations. Further, the Tribe believes inappropriate uses cannot coexist with an active remediation over the long period of time anticipated to implement each of the proposed remedial actions. It is simply too much activity for this sensitive area and tribal practitioners to withstand.

[7] See, for example, E.O. 13007, 13175.

I look forward to your prompt consideration and action on this letter and stand ready to work with you toward an equitable resolution.

Sincerely,

Timothy Williams, Chairman
Fort Mojave Indian Tribe

cc: Hon. Senator Barbara Boxer
Hon. Senator Dianne Feinstein
Jeff Smith, BOR
William Loedder, DOI
Pamela Innis, DOI
Becky Heick, BLM
James Kenna, BLM
Aaron Yue, DTSC
Yvonne Meeks, PG&E
Wayne Donaldson, CA SHPO
Carol Griffiths, AZ SHPO
Jamie Cleland, EDAW
Courtney Ann Coyle, Esq., Counsel, Fort Mojave Indian Tribe

Appendix S – Item 10

From: Kellogg, Lisa [Lisa.Kellogg@arcadis-us.com]
Sent: Tuesday, July 28, 2009 8:58 PM
To: 'Aaron Yue'; Shukla Roy-Semmen; James Eichelberger'
Cc: Meeks, Yvonne J; Doss, Robert; Gilbert, David; Adrienne LaPierre; Walsh, Kimberly; Wini Curley; Pattanayek, Mala
Subject:

Aaron,

On behalf of PG&E, ARCADIS is submitting this email as a follow up to the DTSC's comments sent to PG&E on July 16, 2009 on the response to comments to the Groundwater Risk Assessment. Based on our discussions, PG&E is providing additional information for the comments that we consider outstanding and needing resolution and have summarized the three items in the following email.

As a follow up from our July 2nd 2009 conference call and subsequent emails on July 8, 2009 (attached) documenting the discussions between DTSC and PG&E regarding the path forward for the GWRA and the CMS/FS, PG&E has reviewed the following documents to identify any material inconsistencies between what was originally presented in these documents and our subsequent discussions/emails on the path forward for the GWRA and the CMS/FS:

- Memo from Shukla Roy-Semmen, Staff Toxicologist, Human and Ecological Risk Division (HERD), Review of a Groundwater Human Health Risk Assessment for the PG&E Topock Compressor Station Located in Needles, California, dated March 26, 2009.
- *Response to Comments (RTCs), Comments on the February 2009 Draft Groundwater Human Health and Ecological Risk Assessment*, submitted to stakeholders on May 29, 2009;
- Memo from Shukla Roy Semmen, Staff Toxicologist, Human and Ecological Risk Division (HERD), Review *of PG&E's Response to Agency Comments on the Groundwater Risk Assessment, Topock Compressor Station, Needles, California,* dated June 15, 2009, (final version transmitted to PG&E on July 21. 2009);
- Memo from J. Michael Eichelberger, Staff Toxicologist, HERD, Response to Comments, *Comments on the February Draft Groundwater Human Health and Ecological Risk Assessment, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California,* dated June 17, 2009 (final version transmitted to PG&E on July 16, 2009).

As we discussed, the GWRA will be revised in accordance with the topics discussed during the July 2, 2009 conference call (documentation of the discussion and agreements reached is attached). The purpose of this email is to document where we believe our previous responses to comments (number 2 above) are inconsistent with the direction provided by DTSC during the July 2nd conference call and to clarify our proposed methods for addressing these comments in the revised GWRA. Additionally, this email identifies our proposed resolution to the recent comments (numbers 3 and 4 above) which were transmitted to PG&E on July 21 and July 16, respectively.

Molybdenum (GC number 7, item 1 above; Response to GC number 7, item 2 above; Response to SRA GC 7, item 3 above)

The original written direction provided by DTSC in March 2009 (GC number 7, item 1 above) was to remove all discussions surrounding the essential nutrient evaluation of molybdenum from the main text of the GWRA and include the essential nutrient evaluation as an Appendix to the GWRA. Specifically, based on our conversations with DTSC in March 2009, and our understanding of the specific direction being provided by DTSC, PG&E stated the following in the May 2009 RTCs (response to GC number 7, item 2 above): "Per DTSC's request, the GWRA will be revised to present conclusions for molybdenum as a COC based solely on this evaluation [using the USEPA IRIS oral reference dose approach] and the main text of the GWRA will remove the discussions related to the essential nutrient evaluation."

Based on the subsequent discussions between DTSC and PG&E on July 2, 2009, and our understanding that DTSC acknowledges that the technical evaluations and recommendations of the GWRA would be PG&E's evaluations and recommendations (and that DTSC may not agree with all aspects of PG&E's recommendations), PG&E proposes to retain the technical evaluations of molybdenum as originally presented in the Draft GWRA.

Similarly, in the June 15, 2009 memo prepared by HERD, and provided to PG&E by DTSC on July 21, 2009 (Response to SRS GC7, item 3 above), HERD requested modifications to our original response, asking that PG&E remove much of the text presented in our May 29, 2009 response to HERD SRS GC7. As described above, PG&E proposes to retain the technical evaluation of molybdenum as an essential nutrient (in addition to the traditional RfD based evaluation) as originally presented in the Draft GWRA, consistent with the overall direction provided by DTSC in our discussions on July 2.

Resolution of Additional Comments in Item 3 (Memo from Shukla Roy Semmen, Staff Toxicologist, Human and Ecological Risk Division (HERD), Review *of PG&E's Response to Agency Comments on the Groundwater Risk Assessment, Topock Compressor Station, Needles, California,* dated June 15, 2009, (final version transmitted to PG&E on July 21. 2009))

As requested in Response to comments on HERD SRS GC3 (item 3 above), PG&E agrees to incorporate the response provided to GC4 to GC3 (in item 2 above), and to clarify throughout the revised GWRA that the risk assessment does not determine the ultimate level of remediation that needs to occur at the site, but rather that discussions about the remedial action objectives and decisions regarding the final remedial goals will be determined in the CMS/FS.

In Response to comments on HERD SRS GC10 (item 3 above), HERD reiterates that they do not concur with PG&E's "in-plume" versus "out-of-plume" analysis, and recommends the use of the well-by-well assessment. This same comment was made in HERD's original comments to the GWRA (in SRS comments GC9 and GC 10, item 1 above). As presented in our original responses to these comments, PG&E proposes to retain the in-plume versus out-of-plume analysis in the revised GWRA, with the clarification that such analysis will not be used to dismiss chemicals or risk issues. We believe that it is appropriate for the analysis to remain in the revised GWRA as it provides one additional line of evidence for risk managers to consider in the upcoming CMS/FS, and because the analysis was agreed to by all stakeholders in the approved Risk Assessment Workplan (RAWP).

Resolution of Additional Comments in Item 4 (Memo from J. Michael Eichelberger, Staff Toxicologist, HERD, Response to Comments, *Comments on the February Draft Groundwater Human Health and Ecological Risk Assessment, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California,* dated June 17, 2009 (final version transmitted to PG&E on July 16, 2009))

PG&E concurs with HERD's observation that high concentrations of nitrate in feed can produce toxic effects in ruminants. In response to the question of whether this pathway might be significant for desert bighorn sheep in the vicinity of the Topock Compressor Station, PG&E reviewed information on the distribution of desert bighorn sheep as well as the distribution of nitrate at concentrations greater than background in shallow groundwater. Figure 1 (enclosed) shows the distribution of desert bighorn sheep (recorded in the California Natural Diversity Database [CNDDB]) in relation to the Area of Potential Effects (APE) defined in the Final Programmatic Biological Assessment (CH2M HILL, 2005) As shown in Figure 1, there is very little overlap between the range cited in the CNDDB and the APE. Nevertheless, the distribution of nitrate in shallow groundwater was explored to further evaluate this potential exposure pathway. The southernmost wells with nitrate observed at concentrations greater than background are wells MW-1 near the evaporation ponds and MW-9 in Bat Cave Wash. Neither of these wells overlaps the desert bighorn sheep range cited in the CNDDB (Figure 1). Therefore, this potential exposure pathway is judged incomplete.

Figure 2 (Depth to Groundwater in Water Table Wells and Potentially Exposed Vegetation) was provided in the Response to Comments dated 5/29/09 and is enclosed as well.

As requested by HERD, PG&E will construct tables of information provided in the text responses. The tables will appear in the Final GWRA. Most of the references in the RTC dated 5/29/09 were included in the GWRA. Those not included in the GWRA were either included in the text of the response or in a footnote to the response. A reference list for the RTC is enclosed for convenience.

We look forward to concurrence with these last outstanding items and finalization of the Groundwater Risk Assessment. If you have any questions, please feel free to contact Bob Doss at (415) 973-7601.

Attachments:

Appendix S Items 1, 7, 10a, 10b

BighornSheep_Figure 1.pdf

GWRA RTCs 052909 61.pdf

GWRA RTCs 052909 References plus emai

RE: Path forward on GWRA and C...

Thanks,
Lisa

****

Lisa R. Kellogg, PG, CEM
Principal Geologist
Certified Project Manager

ARCADIS
37973 Barrenda Circle
Murrieta, California 92563
Phone (951) 677-0577
Fax (951) 677-2566
Cell (714) 343-6216

lisa.kellogg@arcadis-us.com
www.arcadis-us.com

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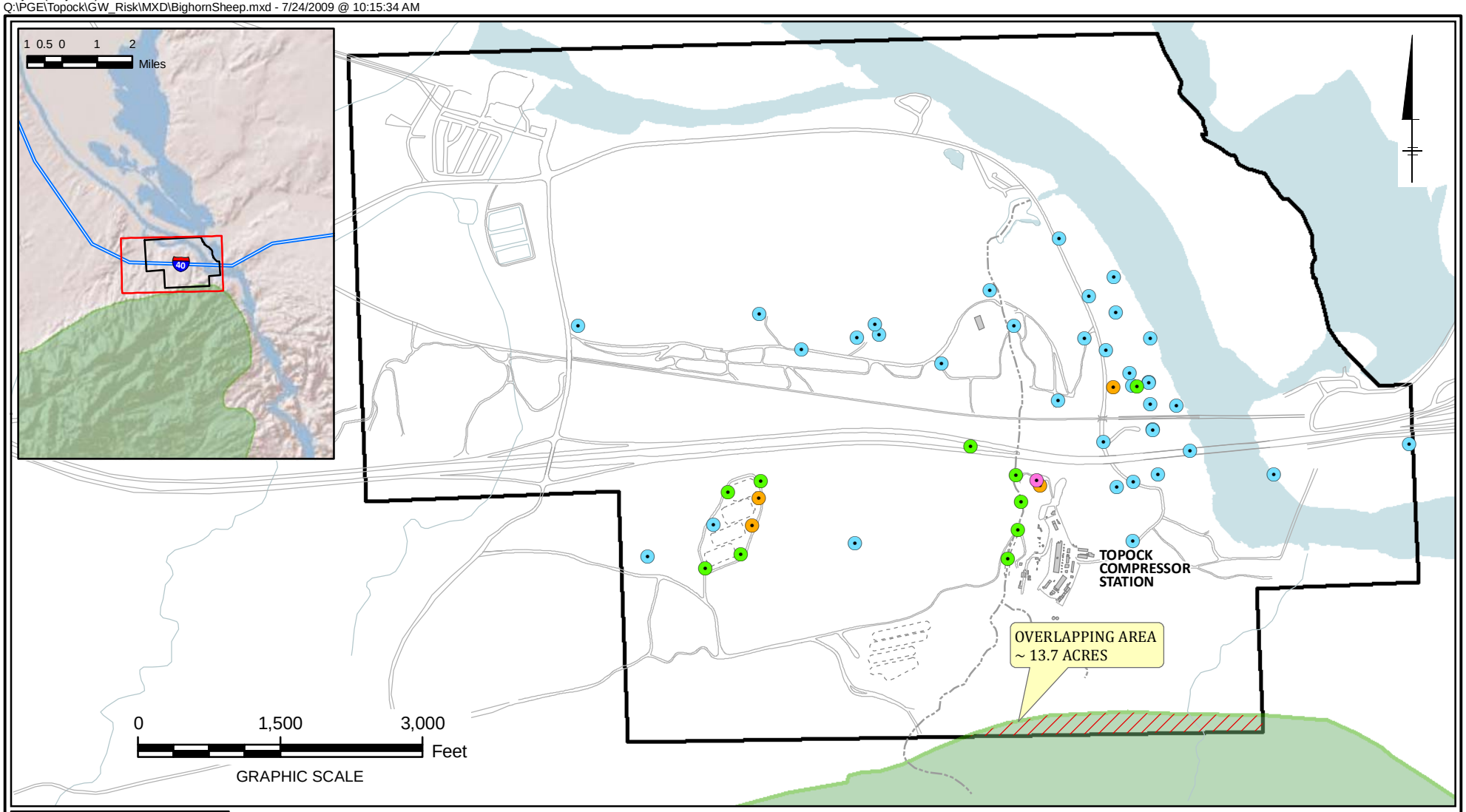

LEGEND:

DISSOLVED NITRATE CONCENTRATIONS IN SHALLOW AQUIFER
- <5.03 mg/L (or ND)
- 5.03 - 10 mg/L
- 10.1 - 19.9 mg/L
- >20 mg/L

NELSON'S BIGHORN SHEEP (*O. CANADENSIS NELSONI*) OCCURRENCE

AREA OF POTENTIAL EFFECTS

BUILDINGS

NOTES:
HOME RANGE DATA OBTAINED FROM THE CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDB, CALIFORNIA DEPARTMENT OF FISH & GAME)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES CALIFORNIA

RESPONSE TO COMMENTS - GROUNDWATER RISK ASSESSMENT

NELSON'S BIGHORN SHEEP OCCURRENCE VERSUS NITRATE IN SHALLOW GROUNDWATER

ARCADIS

FIGURE
1

Appendix S – Item 10b

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Appendix S – Item 11

From: Pamela_Innis@ios.doi.gov [mailto:Pamela_Innis@ios.doi.gov]
Sent: Monday, August 03, 2009 7:34 AM
To: RLDL@pge.com; YJM1@pge.com; Kellogg, Lisa; Christina.Hong@CH2M.com; Serena.Lee@ch2m.com
Cc: Cindi_Hall@fws.gov; Carrie_Marr@fws.gov; DAWN.M.PETERSON@saic.com; Richard Newill; Smith, Jeffery B; Cathy_Wolff-White@blm.gov; Ayue@dtsc.ca.gov; tmssinc@comcast.net
Subject: DOI Responses to the proposed PG&E GWRA RTC

The Department of Interior (DOI) has reviewed the Response to Comments (RTC) on the Draft Groundwater Human Health and Ecological Risk Assessment, Topock Compressor Station, Needles, California". Attached are the DOI responses to the RTC package.

You will also find the DOI response to the Fort Mohave Indian Tribe with regard to appropriate land uses for the area surrounding the PG&E Compressor Station.

If you have any questions regarding the attached, please contact me at your earliest convenience.

Thank you.

Attachments:

GWRA DOI Responses to the RTC

FMIT Response Letter Taylor 7-31-09

Pamela S. Innis
DOI Topock Remedial Project Manager
Office of Environmental Policy and Compliance
U.S. Department of Interior
P.O. Box 25007 (D-108)
Denver, CO 80225-0007
Voice: 303.445.2502
Fax: 303.445.6320
Cell: 303.501.5685

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

Mr. Timothy Williams
Chairman
Fort Mojave Indian Tribe
Merriman Avenue
Needles, California 92363

JUL 3 1 2009

Dear Chairman Williams:

Thank you for your letter dated July 13, 2009, in which you share the views of the Fort Mojave Indian Tribe (Tribe) with regard to appropriate land uses for the area surrounding the Pacific Gas and Electric Company (PG&E) Topock Compressor Station. As you know, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) the Department of the Interior (Department) is overseeing PG&E's preparation of a Remedial Investigation and Feasibility Study (RI/FS) to characterize the nature and extent of contamination released from the Topock Compressor Station and to evaluate remedial alternatives designed to protect public health, welfare, and the environment from this contamination. In this effort, the Department is coordinating closely with the California Department of Toxic Substances Control which is overseeing the investigation pursuant to State authorities.

Your letter shares the Tribe's concerns regarding the future land use assumptions contained in the draft Groundwater Risk Assessment that PG&E prepared as a part of this RI/FS process. In particular, your letter expresses a concern that these assumptions may lead to "unnecessarily high" cleanup standards. Your letter also expresses concerns that these future land use assumptions may be inconsistent with existing resource management plans, including the existing designation of the Beale Slough area as an Area of Critical Environmental Concern (ACEC), and may lead to future uses that do not protect important cultural resources and religious values.

To address these concerns, it is helpful to understand the purpose of the baseline risk assessment prepared during the RI/FS process and, specifically, the role played by future use assumptions in that process. Future use assumptions are developed relatively early in the process to identify human exposures to hazardous substances that can be expected if no response action is taken. Response actions may include access and land use restrictions, which are characterized under CERCLA as "institutional controls." In order to assess baseline (i.e. current) risks posed at a site, CERCLA regulations counsel that assumptions about future uses of the area should be conservative and generally should not include such institutional controls. As described by the Environmental Protection Agency (EPA), "the role of the baseline risk assessment is to address the risk associated with a site in the absence of any remedial action or control, including institutional controls."[1]

---

[1] *Final Rule, National Oil and Hazardous Substances Pollution Contingency Plan,* 55 Fed. Reg. 8666, at 8710-11 (March 8, 1990).

As described in the EPA CERCLA regulations, the baseline risk assessment should:

> Characterize the current and potential threats to human health and the environment that may be posed by contaminants migrating to the groundwater or surface water, releasing to air, leaching through soil, remaining in the soil and bioaccumulating in the food chain. The results of the baseline risk assessment will help establish acceptable exposure levels for use in developing remedial alternatives in the FS…[2]

The exposure levels developed in the baseline risk assessment do not dictate the type of cleanup required. Instead, exposure levels are used in evaluating whether remedial alternatives can be protective. Remedial alternatives may be protective using a variety of approaches including, for example, removal or treatment of hazardous substances, interrupting complete exposure pathways by containing hazardous substances, reducing exposure to hazardous substances through the use of institutional controls, or some combination of these measures.

It is also important to note that the future use assumptions utilized in a baseline risk assessment will not dictate land management decisions. Instead, unrestricted future use assumptions simply inform decision makers of the residual risk that may remain if a remedial alternative does not adequately control exposure pathways. This allows them to make risk management decisions regarding the implementation of access or use restrictions or other institutional controls that may be necessary to reduce risks to acceptable levels. These land use restrictions may include existing restrictions or may involve the development of new land use restrictions that are adopted during remedy selection for a site. If the selected remedial action includes land use restrictions the additional actions necessary to reduce risks to acceptable levels may be lessened. In any event, decisions about the future use of an area are not limited by the conservative land use assumptions employed in the baseline risk assessment.

As your letter rightly points out, the Department's Bureau of Land Management (BLM) is responsible for land use decisions for the BLM-managed land in the vicinity of the Topock Compressor Station. These decisions are considered and adopted through the Resource Management Plan process in consultation with the Tribe, other tribes, and other stakeholders. I encourage you to continue to work closely with the BLM Colorado River District Office and Lake Havasu Field Office throughout this planning process.

Thank you for your interest and continued active participation in the CERCLA remedial action process underway at the Topock site. If I can be of any further assistance in this effort, please contact me at 202-208-3891 or Mr. William Lodder of my staff, at 202-208-6128.

Sincerely,

Willie R. Taylor
Director
Office of Environmental Policy and Compliance

---

[2] 40 Code of Federal Regulations, section 400.430(d)(4).

cc: Councilwoman Linda Otero, Fort Mohave Indian Tribe
Nora McDowell Antone, Fort Mohave Indian Tribe
Luke Johnson, Fort Mohave Indian Tribe
Steven Pl McDonald, Co-counsel, Fort Mojave Indian Tribe
Dr. Leo S. Leonhart, Hargis & Associates
Dr. Michael J. Sullivan
Maziar Movassaghi, Acting Director, Department of Toxic Substances Control
Casey Padgett, DOI Solicitors Office
Pamela S. Innis, DOI OEPC, Topock Project Manager
Ramone McCoy, BLM Lake Havasu Field Office Manager

DOI Responses to PG&E GWRA RTC

The Department of Interior (DOI) has reviewed the Response to Comments (RTC) on the Draft Groundwater Human Health and Ecological Risk Assessment, Topock Compressor Station, Needles, California". The report, dated February 2009, was prepared by Arcadis for the Pacific Gas and Electric Company (PG&E). Comments on the RTC are provided below.

Comment	DOI Response to PG&E GWRA RTC
FMIT GC 2	See text below in DOI SC11.
HERD JME	Accepted under Provision. Provision DOI accepts the response to JME's comments, dependent upon the review of PG&E's text to be provide in the revised redlined/strikeout (RLSO) of the GWRA for review and approval.
DOI SC1	Accept under Provision. <u>Provision</u> DOI is accepts the response to JME's comments, dependent upon the review of PG&E's text to be provide in the revised RLSO of the GWRA for review and approval.
DOI SC2	Accepted
DOI SC3	Accepted under Provision <u>Provision</u> The revised text will read: "This plant community is characterized by dense thickets of tamarisk, or salt cedar (*Tamarix* sp.), sometimes surrounded by arrowweed (*Pluchea sericea*) at the edges. Salt cedar…. Please provide RLSO for review and approval.
DOI SC4	Accepted.
DOI SC5	Not accepted. There is some confusion. Does Table 3-4b mean the PAH's were analyzed for and naphthalene was the only constituent detected? Also, Table 3-4b does not identify DRO and MRO as indicated in the bullet. Finally, was GRO analyzed for? Please clarify the response.
DOI SC6	Accepted.
DOI SC7	Accept under Provision. <u>Provision</u> It is DOI's expectation that PG&E will prepare for review and approval a GWRA Addendum addressing items such as the East Ravine and other studies not yet identified that may be necessary. It is also our expectation that any findings arising from the soils investigation impacting groundwater be included in an GWRA addendum or the soil risk assessment.
DOI SC8	Accepted.
DOI SC9	Accepted.

DOI SC10	Accepted. See discussion. Discussion Please be aware that the use of qualitative descriptors (low, medium, high, etc) is subjective and reliant on the perspective of both the writer and the reader. We note that the synthesis technique used in the GWRA, while informative, did not affect the outcome or the implications for the CMS/FS. Please note that use of similar qualitative synthesis in the future, beyond risk communication, will not be accepted as rationale in conclusions or steering the interpretation of outcomes having implications for determining the need or extent of remedial actions.
DOI SC11	Accept under Provision. <u>Provision</u> We note that much of the Ecosystem Description(s) (e.g., FMIT GC3) has only tangential relevance the GWRA and were included largely for information and completeness; they were essentially immaterial. However, the details of these and other ecological risk assessment descriptions may have material significance in other pending assessments (e.g., Soils Risk Assessment). Please be aware that use of descriptions and ecological risk elements herein does not connote DOI's approval of them for use in the future. DOI strongly urges PG&E to contact us if in your forthcoming risk assessment work you are relying on descriptions and ecological risk elements in the GWRA. DOI will not accept "As described in the GWRA……." premises for ecological risk assessment arguments.
DOI SC12	Accepted.
DOI SC13	Accept. See Discussion. <u>Discussion</u> We acknowledge PG&E's response in its context. Our main objection was (and is) the implications that there was a thorough resource evaluation which formed the basis for the land use determination relating to groundwater usage.
DOI SC14	Accept under Provision. <u>Provision</u> See Comment DOI SC7.
DOI SC15	Accepted.
DOI SC16	Accepted. See discussion. <u>Discussion</u> DOI expects that in the future, the risk assessment professionals, as the end users of the data with experience in application of the data usability guidance, will be more closely involved in the data quality review and assessment. In so doing, risk assessment processes and practices can be better integrated and more easily verified. This concept applies to the actual data specification and sampling strategy as well.
DOI SC17	Accepted under Provision. <u>Provision</u>

	Based on our review of the Groundwater Risk Assessment and PG&E's responses, DOI finds that the Risk Assessment Work Plan (RAWP) does not provides sufficient detail on data analysis and statistical methods, in all cases. DOI accepts PG&E's response on the following condition. Prior to initiation of material work on the soils risk assessment, PG&E will prepare and submit for approval a detailed technical memorandum that sets forth, in site - specific detail, how the soil data will be analyzed to: 1) select COPCs, 2) compute exposure point concentrations, 3) evaluate background issues, 4) designate hot spots, 5) integrate COPCs and their concentrations over the spatial domains that will be evaluated in the human health and ecological risk assessment. . The technical memorandum must also address the how data to be used in the risk assessment integrates, from a useability standpoint (including PARCC parameters), the data, and analysis thereof, in the RFI/RI, the ongoing Data Useability Matrix, and the Background Soils Investigation. It must also identify and evaluate data gaps and discontinuities between data sets to be used in the risk assessment and supporting analysis including those used in the RFI/RI and Background Studies. This technical memorandum must be submitted, along with pertinent reference materials cited therein (e.g., guidance documents, literature, etc., as necessary), in sufficient time to permit DOI to review and comment on the approaches before material work on the soils risk assessment is conducted
DOI SC18	Response Accepted under Provision. Provision set forth in comment DOI SC17.
DOI SC 19	Response Accepted under Provision. Provision set forth in comment DOI SC17.
DOI SC 20	Accepted as Discussed below. 1) We look forward to reviewing PG&E's calculations and will approve as appropriate. 2) Please add the ecological receptor pathway. DOI apparently misspoke on a conference call. DOI will need to see the impact of terrestrial species (e.g., foxes) consuming contaminated groundwater from seeps. Please accept our apologies for any miscommunication.
DOI SC 21	Accepted – See discussion. <u>Discussion</u> DOI concurs that much is yet to be learned about conditions at the Site and the interaction between risk arising from the groundwater and soils cannot be fully understood at this time. We don't necessarily accept all tenants in the response which seem to suggest that soil remediation will serve as the master balancing variable for addressing cumulative Site risks. Nonetheless, we accept your approach as outlined in the response paragraph "at this stage, a logical and efficient program" as the core of risk management approach. We again urge PG&E to leave some margin (cumulative risk headspace) as you move forward establishing groundwater remedial action objectives and cleanup

	goals. Finally, if PG&E hopes to employ the management strategy of using soil remediation as the master balancing variable for addressing cumulative Site risks, then the soils risk assessment must be appropriate for that role. Specifically, uncertainties in the soil risk assessment, and the data supporting it, must be understood and negligible.
DOI SC 22	Accepted pending receipt of Figures. See discussion. <u>Discussion</u> DOI will accept Figures showing cumulative HI and excess cancer risk at each well. We assume these will be computed from the information in Table 7-2. Please note that in the soils risk assessment, where PG&E plans to do spatial interpreting and averaging, DOI expects iso-contouring (or similar visual representation) to be used.
DOI SC 23	Accepted pending receipt of the map.
DOI SC 24	Not Accepted. The RFI/RI Volume 2 states "The occurrence and distribution of these COPC (sic lead) exceedances do not coincide with the historical discharges to Bat Cave Wash, the inactive injection wellPGE-8, or with other identifiable source" Was leaded gasoline considered as an identifiable source in the RFI/RI?
DOI SC 25	Not Accepted. <u>Please provide a redline strike out version of the section when it is available.</u>
DOI SC 26	Not Accepted. Please provide a redline strike out version of the ES when it is available.
DOI SC 27	Not Accepted. <u>Please provide a redline strike out version of the Section when it is available.</u>
DOI SC 28	Accepted

Appendix S – Item 12

From: Aaron Yue [mailto:AYue@dtsc.ca.gov]
Sent: Monday, August 03, 2009 2:19 PM
To: Lisa Kellogg; James Eichelberger; Shukla Roy-Semmen
Cc: Kimberly Walsh; Mala Pattanayek; Wini Curley; Adrienne LaPierre; Gilbert, David; Russell, Curt; Doss, Robert; Meeks, Yvonne J
Subject: Re:

Lisa,

I am concerned that Arcadis has over reached the decisions of the July 2, 2009 conference call between PG&E, DTSC and Arcadis representatives. The email forwarded by Ms. Yvonne Meeks on July 7 and subsequently revised by me on July 8 are record of the only agreements made during that conversation. During that discussion, DTSC did not retract or change our direction on agreements made to resolve the comments on the GWRA. DTSC maintains that PG&E can include the discussion of Molybdenum as an essential nutrient in the appendix of the GWRA and that PG&E should make clear that DTSC has neither endorsed nor approved of the study by the Institute of Medicine. DTSC further maintains that only IRIS RfD can be legitimately used for calculation of toxicity in a risk assessment. Although on the July 2nd conference call, DTSC did agree that PG&E can provide their independent recommendations on COCs based on PG&E's GWRA, that does not mean DTSC is open to reinserting the original text on essential nutrient in the main text. That discussion simply opened the door for PG&E to reference the appendix on Molybdenum and provide specific recommendations in Section 10 of the GWRA as PG&E sees fit. Again, DTSC will likely disagree with those recommendations, depending on how it is written.

Likewise, for the response to comments, it was redundant for Arcadis to reiterate the rationale for the inclusion of essential nutrient since our comment was that we disagree. The important response is that we had reached an agreement to allow for the discussion in the appendix, which was well stated in the first paragraph. Insertion of the essential nutrient discussion in the RTC would lead to DTSC having to again restate our position... which is unnecessary and argumentative.

With regards to HERD-SRS GC10, DTSC did not note in the RAWP that PG&E had proposed a comparison of risk values between the "in-plume" versus "out-of-plume" scenario. In reviewing the RAWP, DTSC only notes that PG&E will distinguish the in-plume and out-of-plume area for the purpose of calculating exposure point concentrations in section 5.3.2. To provide distinction and comparisons between in-plume versus out-of-plume using the current hexavalent chromium plume as a reference location for other constituents would not be appropriate. Furthermore, if PG&E is not using this comparison for risk or COC decisions as stated in the RTC, DTSC questions the value of this comparison for risk managers for hexavalent chromium, and even more so for other COCs.

With respect to your response to nitrate in feed, DTSC's HERD has reviewed the response to the comment regarding possible bighorn sheep exposure to nitrate in forage, specifically that found in Atriplex canescens. Although PG&E has supplied a map suggesting that bighorn sheep do not range sufficiently far enough onto the site for there to be exposure to forage nitrate, DTSC has heard a report that the sheep have recently been seen on site and that Mr. Curt Russell has a picture of it. HERD

requests this be clarified and if the siting is verified then a possible exposure scenario will need to be explored.

With respect to other comments, DTSC preliminarily found them to be sufficient but may provide necessary input when reviewed in detail.

Aaron

Appendix S – Item 13

From: Aaron Yue [mailto:AYue@dtsc.ca.gov]
Sent: Thursday, August 06, 2009 6:22 PM
To: Kimberly Walsh; Lisa Kellogg; Mala Pattanayek; Wini Curley; Adrienne LaPierre;
Cc: James Eichelberger; Karen Baker; Shukla Roy-Semmen; Gilbert, gcr4@pge.com; rldl@pge.com; Meeks, Yvonne J
Subject: Re: Additional clarification of DTSC direction to finalize GWRA

Adrienne and Lisa,

In yesterday's monthly RCRA/CERCLA meeting, Adrienne, Dave Gilbert, Karen Baker and I took the issue of the GWRA off-line until DTSC has a chance to have one additional internal discussion regarding this matter, which we did this afternoon. The communication centered around the management of the Institute of Medicine's Molybdenum study presented in the February 2009 draft GWRA. The project management team believes that the primary use of the included information is to present uncertainties associated with the risk of Molybdenum beyond the calculated result using the reference dose from IRIS. It is our mutual desire to complete the GWRA in a timely fashion. DTSC has concluded that as long the discussion is properly qualified that DTSC is not endorsing or approved of the study by IOM, the actual placement of such text is of little material relevance. Based on this objective, DTSC agrees that the most efficient mean to complete the GWRA is to maintain the text as presented in the February 2009 draft GWRA. DTSC is still in agreement with the first paragraph of the response to comment and believes it properly reflected our agreement and conclusions. However, Arcadis may keep the text as is in the main body of the GWRA.

With respect to the comparison of in-plume and out-of-plume evaluation, DTSC request that it be removed from the GWRA.

DTSC understands from Adrianne LaPierre that Arcadis will be working with Dr. Mike Eichelberger to complete the evaluation of exposure to nitrate for the bighorn sheep.

If you have any additional questions regarding these clarifications, please feel free to contact me.

Aaron

Appendix S – Item 18

From: Kellogg, Lisa [Lisa.Kellogg@arcadis-us.com]
Sent: Tuesday, August 25, 2009 8:28 PM
To: 'Pamela Innis, Dennis Smith, Carrie Marr'
Cc: Meeks, Yvonne J; Adrienne LaPierre; Walsh, Kimberly; Pattanayek, Mala; Wini Curley;
Subject: Response to DOI's August 3rd Comments

Pam, Dennis, and Carrie,

On behalf of PG&E, ARCADIS is submitting these responses to DOI's comments from August 3, 2009. PG&E has reviewed DOI's responses to the Response to Comments (RTCs) on the 'Draft Groundwater Human Health and Ecological Risk Assessment, Topock Compressor Station'. The responses were discussed with DOI on August 18th and August 20th. In general, PG&E accepts DOI's responses and corresponding provisions.

There were five responses that were categorized as 'Not Accepted' by DOI which were discussed: DOI SC5, and DOI SC24 through DOI SC27. Additionally, there were two comments, DOI SC7 and DOI SC 20, which we discussed, in detail, the best path for resolution. Based on our discussions on August 20, 2009, we would like to confirm the resolution to each of these seven comments is as follows:

1) DOI SC5: The information in Table 3-4b provides a complete list of all constituents analyzed, and identifies with a "√" those constituents which were detected. Accordingly, no revisions to the table are necessary.

2) DOI SC24: DOI withdraws this comment and thus no response is necessary.

3) DOI SC25 through DOI SC27: The revised GWRA will be submitted in redline strike out. Based on our discussions on August 20th, we understand this will satisfy DOI's request to see these specific revisions in a red-line strike out form.

4) DOI SC7: We discussed the East Ravine data, and how the implications of the data on the risk assessment will be presented in the East Ravine Report, which will be an Appendix to the CMS/FS. We discussed that we will be presenting a screening-level analysis in the East Ravine Report, in which we identify the compounds detected in the East Ravine groundwater monitoring, discuss the range of concentrations detected, and then provide the rationale as to why the data from the East Ravine do not change the conclusions of the GWRA. We discussed why a detailed quantitative risk assessment of the East Ravine data would not be necessary, as such detailed quantitative risk calculations would not change the identification of those constituents that need to be carried forward and incorporated into the CMS/FS. The revised GWRA will describe these current plans for incorporating recent information from the East Ravine investigation into the upcoming CMS/FS.

5) DOI SC20: Pam and Yvonne discussed this comment in a subsequent phone call on 8/24/09. This is an East Ravine characterization question. PG&E believes that this evaluation has been

completed and that areas of observed soil moisture are related to precipitation, not groundwater discharge. If DOI requests, further characterization of the "seeps" will be discussed in the context of the East Ravine Data Gaps Workplan and subsequent risk evaluations. No revisions of the GWRA will be made.

All other responses provided by DOI will be incorporated into the revised GWRA, which will be submitted as a red-line strike out, and/or will be incorporated into the upcoming phases of the project.

We hope that we have adequately captured the agreements reached during the recent discussions, and appreciate the open dialogue and commitment to moving forward to the groundwater remedy. Please let us know by September 2, 2009 if we have missed anything, and/or inadvertently mischaracterized any of our discussions so that we may proceed with the GWRA.

-Lisa

Lisa Kellogg, P.G. | Principal Geologist | lisa.kellogg@arcadis-us.com

ARCADIS U.S., Inc. | 37973 Barrenda Circle | Murrieta, CA 92563
T. 951.677.0577 | M. 714.343.6216 | F. 951.677.2566
www.arcadis-us.com
Professional Geologist / CA, 6838

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Appendix S – Item 19

From: Walsh, Kimberly
Sent: Friday, August 28, 2009 4:36 PM
To: James Eichelberger
Cc: Carrie-Marr@fws.gov; Meeks, Yvonne J; Aaron Yue; 'Pamela_Innis@ios.doi.gov'; Kellogg, Lisa; DeShields, Bridgette; Pattanayek, Mala; Selden, Sara
Subject: Topock - GWRA Appendix "X" for Your Review

Mike,

As discussed on our call on Aug 11, 2009, on behalf of PG&E, ARCADIS has prepared an appendix (see Appendix "X" attached) in response to the March 26, 2009 and June 17, 2009, comments provided by the DTSC/HERD. In response to agency comments on the GWRA and on the response to comments (RTCs), we expanded the GWRA via this appendix to include three additional potential exposure pathways for ecological receptors. These potential pathways are:

- Shallow-rooted wetland plant exposure to chemicals in groundwater via root uptake.
- Deep-rooted phreatophyte exposure to chemicals in first encountered groundwater via root uptake.
- Transfer of nitrate in groundwater to plant foliage via root uptake and translocation, then potential ingestion of nitrate in plant tissue by ruminants, specifically the desert bighorn sheep.

Based on our evaluation, the conclusions are:

- The shallow-rooted wetland plant pathway is considered insignificant and will not be evaluated further.
- The pathway from chemically affected groundwater to phreatophytes is considered insignificant because maximum concentrations in shallow groundwater underlying these plant communities are very low relative to concentrations known to be phytotoxic.
- The expected plant tissue concentrations of nitrate are well within the "safe" levels for ruminants.

As I mentioned in my phone messages to you, we've evaluated potential exposure of desert bighorn sheep to nitrate in a qualitative manner based on information provided in the McKeon et.al. (2006) study. The study did not support developing a specific bioaccumulation factor (BAF) for nitrate uptake by plants; however, the study clearly indicates that plant tissue concentrations at Topock would be expected to be well below the maximum safe level in ruminant feed. I'll call you again next week to follow up on this point and get your thoughts on this.

Please review and provide your comments by September 4, 2009 so that we can incorporate the approved Appendix X in the revised GWRA, prior to its submittal for agency review. Please note that the appendix designation "X" is temporary and will likely change in the final GWRA document after all requested changes are incorporated.

Please let me know if you have any questions.

Kim

Kim Walsh, MPH | Principal Scientist | kimberly.walsh@arcadis-us.com
ARCADIS U.S., Inc. | 2033 North Main Street, Suite 340 | Walnut Creek, CA, 94596
T. 925.296.7837 | M. 925.323.1467 | F. 925.274.1103
www.arcadis-us.com

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Attachments:

Draft Topock GWRA ERA Appendix X.pdf

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Appendix X – Supplemental Ecological Risk Evaluation to Address HERD Comments dated June 17, 2009

Draft Final Groundwater Human Health and
Ecological Risk Assessment
Topock Compressor Station, Needles, California

August 2009

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Acronyms and Abbreviations

APE	Area of Potential Effect
BCW	Bat Cave Wash
bgs	below ground surface
COPC	constituent of potential concern
CSM	conceptual site model
DTSC	Department of Toxic Substances Conrol
ERA	ecological risk assessment
GWRA	Groundwater Risk Assessment
HERD	Human and Ecological Risk Division
LOAEC	lowest observable adverse effects concentration
mg/kg	milligrams per kilogram
mg/L	milligram(s) per liter
NOAEC	no-observable adverse effect concentration
PG&E	Pacific Gas and Electric
ppm	part(s) per million
RFI/RI	Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation
RTC	response to comment
site	Topock Compressor Station in Needles, California
UTL	Upper Tolerance Limits

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Appendix X

Supplemental Ecological Risk Assessment to Address Regulatory Agency Comments

1. Introduction

This appendix was prepared in response to the March 26, 2009 and June 17, 2009, comments provided by the Human and Ecological Risk Division (HERD) (California Department of Toxic Substances Control [DTSC], 2009a,b) on the Pacific Gas and Electric (PG&E) Response to Comments (RTCs) for the Draft Groundwater Human Health and Ecological Risk Assessment (GWRA) for Topock Compressor Station in Needles, California (the site) (ARCADIS, 2009).

A detailed description of the transport mechanisms and exposure pathways is presented in Section 5 of the GWRA main text. Consistent with the approved Risk Assessment Work Plan (ARCADIS, 2008), the focus of the ecological risk assessment (ERA) in the main text of the GWRA was on evaluating the potential transport pathway to the Colorado River. In response to agency comments on the GWRA and on the RTCs, PG&E has expanded the GWRA via this appendix to include three additional potential exposure pathways for ecological receptors. These potential pathways are:

- Shallow-rooted wetland plant exposure to chemicals in groundwater via root uptake.

- Deep-rooted phreatophyte exposure to chemicals in first encountered groundwater via root uptake. Phreatophytes identified at the site are presented in Table 1.

- Transfer of nitrate in groundwater to plant foliage via root uptake and translocation, then potential ingestion of nitrate in plant tissue by ruminants, specifically the desert bighorn sheep (*Ovis canadensis nelsoni*).

The remainder of this appendix discusses each of the potential exposure pathways listed above.

2. Conceptual Site Model

The conceptual site model (CSM) is presented in Figure 5-1 of the GWRA report. The primary chemical source is discharge of untreated wastewater to Bat Cave Wash (BCW). For this assessment, only wells with depths to groundwater shallower than 80 feet below ground surface (bgs) were considered; wells where groundwater occurred deeper were considered beyond depths of interest for phreatophyte exposure (see Section 3 for discussion of root depths). These wells are presented in Figure 1

The following describes the components of the CSM as it relates to the potential pathways listed above in Section 1.

2.1 Chemicals of Potential Concern

The focus of this assessment was on constituents of potential concern (COPCs) from the Revised Final Resource Conservation and Recovery Act Facility Investigation/Remedial Investigation (RFI/RI) Volume 2 (CH2M HILL, 2009), consisting of hexavalent chromium, molybdenum, nitrate, and selenium.

2.2 Background Screening

The maximum detected concentrations of COPCs in shallow groundwater wells potentially co-located or nearest where phreatophytes occur in the Area of Potential Effect (APE) (Figure 1) were compared with background Upper Tolerance Limits (UTLs) (Table 2). If the maximum was greater than or equal to the background UTL, the chemical was retained for further evaluation.

Figure 2 presents the maximum detected concentrations in shallow wells co-located with phreatophytes along the east side of National Trails Highway. Table 2 presents the comparison of the maximum detected concentrations of the four COPCs to corresponding background UTLs; results are summarized as follows:

- Maximum hexavalent chromium concentration of 0.148 milligrams per liter (mg/L) in well PE-1 exceeds the background UTL of 0.0318 mg/L.

- Maximum nitrate concentration of 14.4 mg/L in MW-30-30 exceeds the background UTL of 5.03 mg/L.

- Maximum molybdenum concentration of 0.1 mg/L in well MW-30-30 exceeds the background UTL of 0.0363 mg/L.

- Maximum selenium concentration of 0.00146 mg/L in well MW-47-55 does not exceed the background UTL of 0.0103 mg/L.

Figure 2 presents the maximum detected concentrations in wells co-located with phreatophytes at BCW (see wells MW-41S, MW-13, and MW-11). Table 2 presents the comparison of the four COPCs to corresponding background UTLs; results are summarized as follows:

- Maximum hexavalent chromium concentration of 1.71 mg/L in well MW-11 exceeds the background UTL of 0.0318 mg/L.

- Maximum nitrate concentration of 16.4 mg/L in well MW-11 exceeds the background UTL of 5.03 mg/L.

- Maximum molybdenum concentration of 0.035 mg/L in well MW-11 does not exceed the background UTL of 0.0363 mg/L

- Maximum selenium concentration of 0.0136 mg/L in well MW-11 exceeds the background UTL of 0.0103 mg/L.

Based on comparison with background UTLs for groundwater, hexavalent chromium, molybdenum, nitrate, and selenium were retained for further evaluation as COPCs in shallow groundwater that may be contacted by phreatophytes.

3. Exposure Assessment

Groundwater level data for water table wells were obtained from Appendix B of the Revised Final RFI/RI Volume 2 (CH2M HILL, 2009) and Appendix B of the *Monitoring Report for the Floodplain Reductive Zone In-Situ Pilot Test* (ARCADIS, 2007). Figure 1 displays the depth-to-water data for water table wells. As mentioned earlier, only wells with depths to groundwater shallower than 80 feet bgs were considered in this assessment; wells where groundwater occurred deeper were considered beyond depths of interest for phreatophyte exposure (see below for discussion of root depths). Depths to groundwater are as shallow as approximately 4 feet bgs near the river. Depth-to-water data, as well as an understanding of plant root depths, form the basis of the exposure evaluation for plants. Exposure of plants and subsequent translocation of nitrate from roots to foliage is also required for exposure of desert bighorn sheep to nitrate originating in groundwater.

The following sections describe the potential exposure pathways for shallow-rooted wetland plants, deep-rooted phreatophytic plants, and ruminant ingestion of plant tissue.

3.1 Shallow-Rooted Wetland Vegetation

The potential exposure pathway for shallow-rooted wetland plants was evaluated qualitatively by reviewing depth-to-water data, considering geochemical processes that operate in wetland environments, and reviewing COPC concentrations in groundwater. Historical depth-to-water measurements suggest that shallow groundwater may not discharge at wetland areas (Figure 2). Shallow-rooted plants such as common reed (*Phragmites communis*), cattails (*Typha sp.*), sedges (*Carex sp.*), and bulrush (*Scirpus sp.*) may not contact groundwater given that the shallowest depth to water measured near the river is approximately 4 feet (CH2M HILL, 2009), and these plants have ready access to surface water from the river. Deeper rooted plants, such as salt cedar and arrow weed, present immediately adjacent to the river or ponded water at the mouth of BCW, also have ready access to the surface water.

3.2 Deep-Rooted Phreatophytic Vegetation

The exposure pathway for deeper rooted phreatophytes was evaluated quantitatively. The following describes the types of phreatophytes present at the site and their average rooting depths obtained from various literature sources.

Potential exposure to COPCs (hexavalent chromium, nitrate, selenium, and molybdenum) depends on depth to groundwater, root depths, and chemical distribution in the groundwater. Shallow groundwater wells that best represent COPC concentrations potentially contacting phreatophytic vegetation (Figure 2) were selected based on the following criteria:

- Maximum depth to groundwater of 80 feet bgs
- Co-location with phreatophytic vegetation
- Nearest upgradient well (selected only if wells were not available in phreatophytic vegetation).

MW-11 was the only well selected that is not co-located with phreatophytic vegetation, however, this well is the nearest upgradient well of phreatophytes at BCW.

The potential exposure pathway for phreatophytes was evaluated quantitatively by first assessing the potential for root contact with chemically affected groundwater, then considering groundwater concentrations of COPCs where contact may occur. Table 1 provides maximum root depths for phreatophytes identified at the site showing that some species, such as honey mesquite (*Prosopis glandulosa*) can have roots up to 50 feet deep. Depths to groundwater in the BCW and on the east side of National Trails Highway where phreatophytes occur range from 30 feet bgs to 4 feet bgs. Deep-rooted phreatophytic upland plants may contact COPCs occurring in shallow groundwater. Such phreatophytes include mesquite (*Prosopis* spp.), palo verde (*Cercidium sp.*), salt cedar (*Tamarix ramosissima Ledeb.*), arrowweed (*Pluchea sericea*), and catclaw acacia, *(Acacia greggii*), which occur within upland areas near the river and in BCW where depths to water are also within potential root zones (Figure 1). Consistent with this information, mesquite and palo verde grow in the BCW in areas with water table depths up to 50 feet bgs (Figure 1 of this appendix and Figure 5-3 in CH2M HILL, 2009). The shallower rooted salt cedar (*Tamarix ramosissima Ledeb*.) is found where the depth to groundwater is 4 to 32 feet bgs (or where there is surface water) (Figure 1), which is consistent with its reported maximum rooting depths of about 25 feet (Table 1). Therefore, the concentrations of COPCs in groundwater underlying the deeply rooted plants are of interest and are further evaluated in Section 4.0.

3.3 Ruminant Ingestion of Plant Tissue

Given that phreatophytic vegetation may contact groundwater in the APE, ingestion of chemicals in plant tissue is a potential exposure pathway to other ecological receptors. In particular, transfer of nitrate in groundwater to plant foliage via root uptake and translocation, then potential ingestion of nitrate in plant tissue by ruminants is a potential pathway of interest given:

- The presence of desert bighorn sheep in the area
- Known potential for nitrate toxicity in ruminants resulting from exposure to nitrate in feed.

Desert bighorn sheep are a federally listed sensitive species. This species is primarily associated with rugged terrain and mountainous areas but uses a variety of habitat types including desert riparian and desert scrub (Hopkins, as included in the California Wildlife Habitat Relationships System, 2009). The occurrence of this species included in the California Natural Diversity Database (CNDDB, 2009) is shown on Figure 3. The nearest occurrence of the desert bighorn sheep to the site according to the CNDDB is in the Chemehuevi Mountains. However, desert bighorn sheep have been observed by Topock Compressor Station personnel and are a transient and infrequent visitor to the area around the APE (Russell, pers. comm. 2009). Available information indicates that the desert bighorn sheep are infrequently present and, therefore, infrequently feed on plants within the APE but outside the area of overlap shown on Figure 3.

The diet of the desert bighorn sheep is varied and has been reported to contain 50 percent browse with the remainder of the diet comprised of forbs, grasses, and succulents (Brewer and Harveson, 2007). In the APE, browse would include phreatophytes. Therefore, the diet composition likely further reduces the potential for exposure to nitrate in plant tissue accumulated from groundwater.

Although desert bighorn sheep are expected to visit the site infrequently and phreatophytes are expected to comprise only about half of their diet at Topock, plant tissue concentrations were evaluated qualitatively based on the maximum nitrate concentration observed in shallow groundwater within the area where phreatophytes occur in the APE (Figure 2). The maximum concentration of nitrate in groundwater in this area is 16.4 mg/L from MW-11 in the BCW (Table 2). A study by McKeon et al. (2006) of nitrate uptake patterns over a nitrate-contaminated aquifer in northeast Arizona, showed that phreatophyte tissue concentrations did not exceed safe levels

(see Section 4) for ruminants even when the plants were growing in the on-plume area. The phreatophyte, *Atriplex canescens*, growing over a shallow groundwater plume with high concentrations of nitrate (up to 1210 mg/L) accumulated a maximum average nitrate concentration of 727 milligrams per kilogram [mg/kg] nitrate-N in leaf tissue (plants harvested in 2000). Later analyses yielded an average nitrate concentration of 108 mg/kg nitrate-N in leaf tissue on the plume (estimated based on Figure 5 of the McKeon et al. (2006) study; plants harvested in July 2002). The on-plume area sampled was the most heavily contaminated part of the plume, presumably around the greater than 1000 mg/L contour for nitrate-N (Figure 1 of the McKeon et al. [2006] study).

The maximum nitrate-N concentration of 16.4 mg/L at Topock is well below the on-plume groundwater concentrations reported in the McKeon et al (2006) study (maximum was 1210 mg/L). As a result, plant tissue concentrations at Topock are expected to be well below the maximum average concentrations detected in leaf tissue (951 mg/kg dry-weight for *Sarcobatus vermiculatus* and 727 mg/kg dry-weight for *A. canescens*) in the McKeon et.al. (2006) study. The reported nitrate-N concentrations in groundwater at the McKeon et.al. (2006) study site ranged from 12 to 1210 mg/L. The reported average leaf tissue nitrate-N concentrations ranged from 20 to 951 mg/kg dry-weight.

4. Toxicity Assessment

A no-observable adverse effect concentration (NOAEC) was selected for each chemical to evaluate the toxicity of COPCs to plants. Table 3 presents the NOAECs selected for this assessment. The following describes the toxicity values for hexavalent chromium, molybdenum, selenium and nitrate. Potential toxicity of nitrate in plant tissue to ruminants is also described.

4.1 Hexavalent Chromium

A NOAEC of 2 mg/L for hexavalent chromium was reported in Sorenson et al. (2009) for salt cedar. Mesquite (*Prosopis spp.*) tolerates hexavalent chromium in solutions of up to 125 mg/L when grown in agar and 80 mg/L when grown hydroponically (Aldrich et al., 2003) indicating a hexavalent chromium NOAEC for mesquite of 80 mg/L (Table 3).

4.2 Selenium

A NOAEC of 2 mg/L for selenium was reported for salt cedar in Sorenson et al. (2009) (Table 3).

4.3 Molybdenum

A lowest observable adverse effects concentration (LOAEC) of 96 mg/L was reported for the molybdenum-sensitive species such as bush bean (Adriano, 2001). Assuming a factor of 10 reduction in concentration to extrapolate from the LOAEC to a NOAEC for molybdenum, the NOAEC is 9.6 mg/L (Table 3).

4.4 Nitrate

Because desert plant communities are typically limited by nitrogen during growing periods (Zak and Whitford, 1988), nitrate uptake from the groundwater is expected to have beneficial rather than adverse effects on the plants. For example, in a desert system in Arizona the phreatophyte, *Atriplex canescens*, growing over a shallow groundwater plume with high concentrations of nitrate (maximum nitrate-N concentration = 300 mg/L), accumulated 5 times more nitrate in its leaves during summer than plants growing off the plume (up to 500 mg/kg nitrate-N in leaf tissue; McKeon et al., 2006). The study estimated that at the McKeon site, 40 kg of plume

water would supply sufficient nitrogen for production of 1 kg of plant biomass. Isotope analysis indicated most of the nitrate came from the groundwater plume. The increased nitrate in the plant tissues produced no phytotoxicity (McKeon et al., 2006).

Under normal conditions, nitrate is converted to nitrite by microorganisms in ruminants, which is then converted to ammonia and on to proteins and other compounds. Nitrate can be toxic to animals if the rate of conversion of nitrate to nitrite is greater than the conversion of nitrite to ammonia, resulting in a buildup of nitrite in the animal (A&L Great Lakes Laboratories, 2002). Various factors can affect the nitrite accumulation including the plant species, section of the plant (e.g., stalks are higher in nitrate content), plant age, and weather conditions (conditions that reduce plant growth increase nitrate production). Using a generalized interpretation for laboratory forage nitrate tests, 0 to 3,000 parts per million (ppm dry weight) in feed is considered safe for all cattle; 3,000 to 5,000 ppm (dry weight) in feed is considered safe for non-pregnant beef cattle; 5,000 to 10,000 ppm (dry weight) in feed is a small risk for some cattle; and greater than 10,000 ppm (dry weight) in feed is considered toxic for all cattle (Denman et al., undated).

5. Risk Characterization

The following describes the risk characterization for the exposure pathways evaluated above.

5.1 Shallow-Rooted Vegetation

As HERD stated (DTSC, 2009a), sampling has not demonstrated movement of the groundwater plume with COPCs into the Colorado River. Further, the reducing conditions in wetland areas would result in precipitation of hexavalent chromium, selenium, and molybdenum binding the metals and reducing bioavailability. Hexavalent chromium and selenium were not detected in shallow wells nearest the river (MW-28-25, MW-29, and MW-27-20); molybdenum was either not detected or present at a concentration below the background UTL in these wells (Figure 1). The data suggest wetland/riparian plants along the river are unlikely to take up the COPCs from the groundwater. Therefore, this shallow-rooted wetland/riparian plant pathway is considered insignificant and will not be evaluated further.

5.2 Deep-Rooted Phreatophytic Vegetation and Risk to Ruminants from Nitrate in Plants

Hazard quotients were calculated for potential exposure of phreatophytes to COPCs in groundwater (Table 4). All hazard quotients were well below one indicating no significant risk of phytotoxicity.

The maximum nitrate-N concentration is 16.4 mg/L (at MW-11), much lower than the maximum concentration in the McKeon et. al. (2006) study (1210 mg/L). No phytotoxicity was reported in the McKeon et.al. (2006) study. Given that nitrate concentrations in groundwater at Topock were orders of magnitude lower than those observed at the McKeon et.al. (2006) study site, concentrations in leaf tissue at Topock are expected to be well below 951 mg/kg dry-weight, the maximum average nitrate-N concentration observed in the McKeon et.al. (2006) study.[1] Levels assumed to be safe in feed for ruminants are up to 3,000 mg/kg dry-weight [Denman et al., undated]. Therefore, toxicity due to nitrate would also not be predicted for ruminants.

[1] Average leaf tissue nitrate-N concentrations ranged from approximately 20 mg/kg to 951 mg/kg dry-weight depending on the plant species, sampling event, and grazing pressure.

The maximum hexavalent chromium concentration in the BCW (within or bounding the area occupied by phreatophytes) is below levels believed to be toxic to phreatophytic plants such as salt cedar and mesquite (Table 3). Hexavalent chromium concentrations in shallow groundwater in the upland east of National Trails Highway are at least an order of magnitude lower than those observed in the BCW at MW-11; therefore, phytotoxicity due to hexavalent chromium would not be predicted in either area. Similarly, the maximum concentrations for selenium are below the reported NOAEC (Table 3). Molybdenum concentrations are orders of magnitude below the LOAEC reported, and the maximum groundwater concentration (0.1 mg/L) is still well below the extrapolated NOAEC (9.6 mg/L) (Table 3).

The maximum COPC concentrations in groundwater described above are not associated with phytotoxicity and, therefore, effects would not be predicted in the study area where phreatophytic vegetation is potentially exposed. Therefore, the exposure pathway from chemically affected groundwater to phreatophytes is insignificant because maximum concentrations in shallow groundwater underlying these plant communities are very low relative to concentrations known to be phytotoxic.

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Tables

Table 1
Maximum Rooting Depths of Site-Specific Phreatophytes

Species of Phreatophyte	Maximum Root Depth (feet)	Reference
Honey Mesquite (*Prosopis glandulosa*)	49	Glenn and Nagler (2005), Alth et al. (1991)
Palo Verde (*Cercidium* sp.)	50	Deep roots, not as deep as mesquite, Barth and Klemmedson (1982), MW-21 well near pure Palo Verde has about 50' depth to groundwater
Tamarisk (*Tamarix* sp.) (esp. Salt Cedar)	25	Glenn and Nagler (2005), Shrader (1977)
Arrowweed (*Pluchea sericea*)	20	Alth et al. (1991)
Catclaw Acacia (*Acacia greggii*)	>18	Zimmerman (1969)

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Table 2
Maximum Groundwater Concentrations in Wells Co-Located with or Near Phreatophytes

		East of National Trails Highway[a]			Bat Cave Wash[b]			
COPC	Background UTL (mg/L)	Maximum Concentration (mg/L)	Location of Maximum	Exceeds Background?	Maximum Concentration (mg/L)	Location of Maximum	Exceeds Background?	Further Evaluation?
Hexavalent Chromium	0.0318	0.148	PE-1	YES	1.71	MW-11	YES	YES
Molybdenum	0.0363	0.1	MW-30-30	YES	0.035	MW-11	NO	YES
Nitrate	5.03	14.4	MW-30-30	YES	16.4	MW-11	YES	YES
Selenium	0.0103	0.00146	MW-47-55	NO	0.0136	MW-11	YES	YES

Notes:
COPC = constituent of potential concern
mg/L = milligram(s) per liter
UTL = upper tolerance limit

Footnotes:
a. Well locations are shown on Figure 2.
b. Represented by monitoring wells MW-41S, MW-13, and MW-11.

Table 3
Groundwater No-Observed Adverse Effects Concentrations

COPC	Maximum Concentration (mg/L)[a]	NOAEC (mg/L)	Source
Hexavalent Chromium	0.148	2	salt cedar; Sorenson et al. 2009
		80	mesquite; Aldrich et al. 2003
Molybdenum	0.1	9.6 b	bush bean; Adriano, 2001
Nitrate	16.4	1210	fourwing saltbush and black greasewood; McKeon, 2006
Selenium	0.0136	2	salt cedar; Sorenson et al. 2009

Notes:

COPC = Chemical of potential concern.

NOAEC = No-observed adverse effects concentration.

a Maximum concentration for all monitoring wells from Figure 2.

b Extrapolated from LOAEC to NOAEC assuming a factor of 10 reduction.

References:

Adriano, D.C. 2001. *Trace Elements in Terrestrial Environments: Biogeochemistry, Bioavailability, and Risks of Metals*. Pp. 607. Springer.

Aldrich, M.V., J.L. Gardea-Torresdey, J.R. Peralta-Videa, and J.G. Parsons. 2003. Uptake and Reduction of Cr(VI) to Cr(III) by Mesquite (Prosopis spp.): Chromate-Plant Interaction in Hydroponics and Solid Media Studied Using XAS. *Environ. Sci. Technol.* 37:1859-1864.

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Sorenson, M.A. , D.R. Parker, and J. T. Trumble. 2009. Effects of pollutant accumulation by the invasive weed saltcedar (Tamarix ramosissima) on the biological control agent Diorhabda elongata (Coleoptera: Chrysomelidae). *Environmental Pollution* 157: 384–391.

Table 4
Hazard Quotients - Protection of Plant Health

COPC	Maximum Concentration (mg/L)[a]	NOAEC (mg/L)	Hazard Quotient
Hexavalent Chromium	0.148	2	0.1
		80	0.002
Molybdenum	0.1	9.6 b	0.01
Nitrate	16.4	1210	0.01
Selenium	0.0136	2	0.01

Notes:
COPC = Chemical of potential concern.
NOAEC = No-observed adverse effects concentration.
a Maximum concentration for all monitoring wells from Figure 2.
b Extrapolated from LOAEC to NOAEC assuming a factor of 10 reduction.

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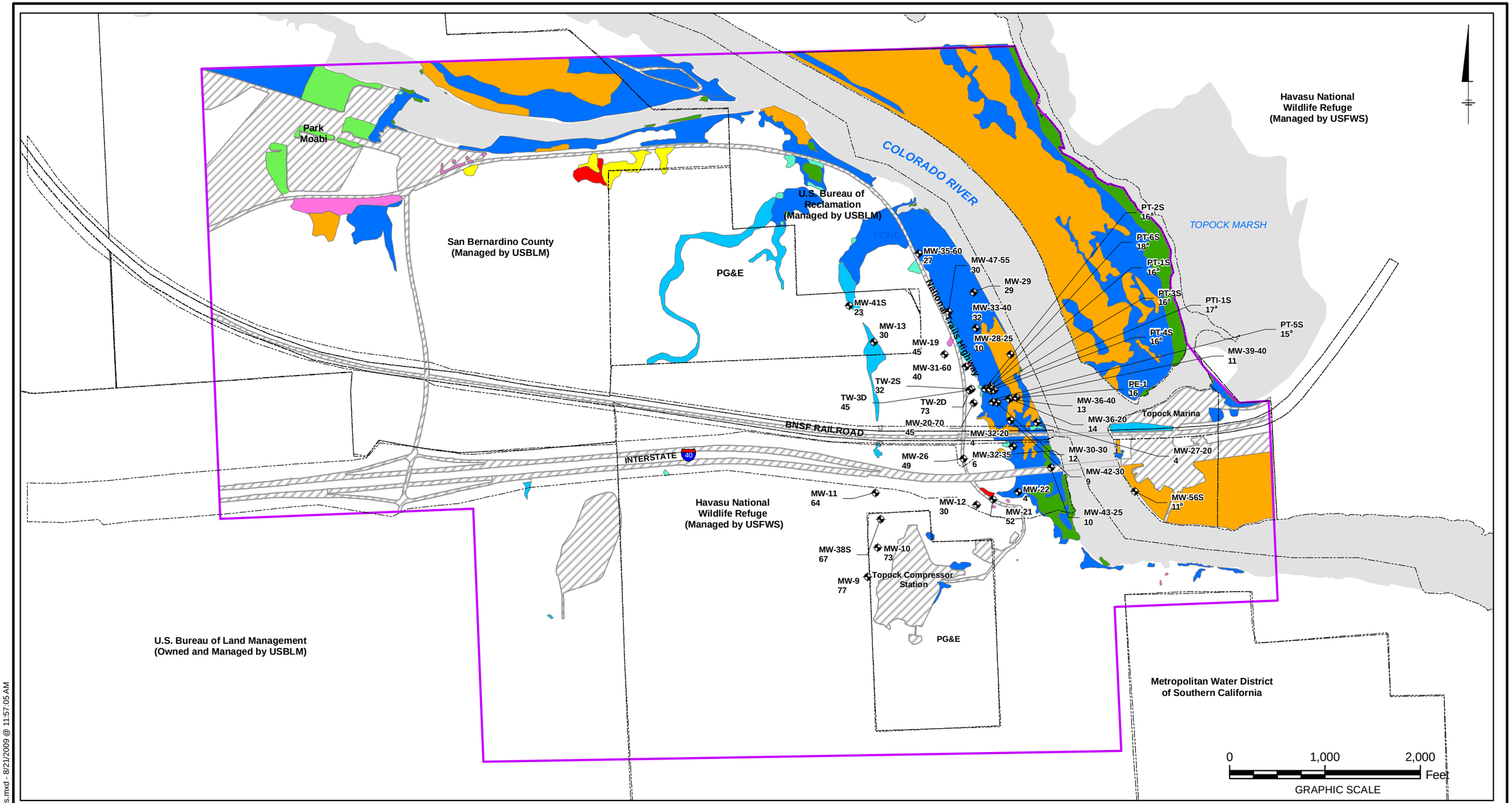
Figures



LEGEND:

- Arrowweed
- Landscaped
- Mesquite
- Mesquite/Palo Verde
- Palo Verde
- Salt Bush
- Salt Cedar
- Salt Cedar/Mesquite
- Wetland/Marsh
- Developed Area
- Monitoring Wells
- Property Boundaries
- Area of Potential Effects
- MW-16 — Well ID
- 199 — Depth to Groundwater (ft bgs)

NOTES:

ft bgs = feet below ground surface

1. Figure includes all active wells found in the Shallow Zone of the Alluvial Aquifer in which groundwater was encountered within 80 ft bgs. Well ID list from Table B-1 - Drilling and Well Construction Summary for the RFI/RI Characterization (Appendix B, RFI/RI Vol. 2, CH2HILL, 2008).
2. Approximate depth to groundwater calculated from data presented in Table B-1 - Drilling and Well Construction Summary for RFI/RI Characterization, Appendix B. RFI/RI Volume 2. (CH2MHILL, 2008)
3. Extent of vegetation communities from Figure 6 of the Programmatic Biological Assessment for Pacific Gas and Electric Topock Compressor Station Remedial and Investigative Actions report (CH2MHILL, 2007).

[a] Depth to water data from Appendix B of the May 2007 Monitoring Report for the Floodplain Reductive Zone In-Situ Pilot Test (ARCADIS, 2007).

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

GROUNDWATER HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

DEPTH TO GROUNDWATER IN WATER TABLE WELLS AND POTENTIALLY EXPOSED VEGETATION

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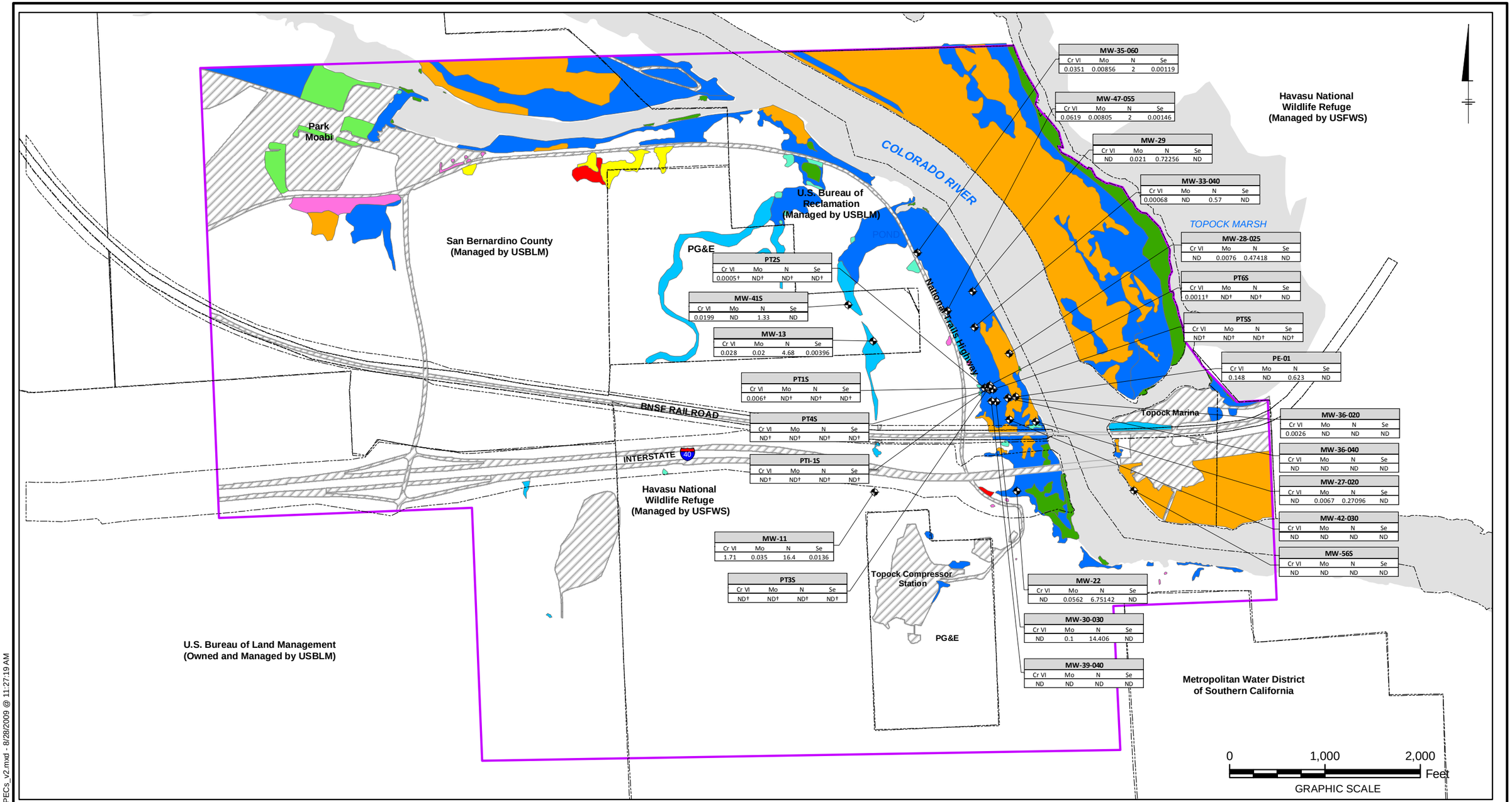
FIGURE 1

[MC-85 VJR] SANF-85 EGH
Project (RC000689.0002 Task 2)
Q:\PGETopockGW_Risk\MXD\Plume_Veg_Wells.mxd - 8/21/2009 @ 11:57:05 AM



LEGEND:

- Arrowweed
- Landscaped
- Mesquite
- Mesquite/Palo Verde
- Palo Verde
- Salt Bush
- Salt Cedar
- Salt Cedar/Mesquite
- Wetland/Marsh
- Developed Area
- Monitoring Wells
- Property Boundaries
- Area of Potential Effects

MW-29			
Cr VI	Mo	N	Se
ND	0.021	0.72256	ND

Well ID

Maximum Detected Concentration (mg/L)

NOTES:

ft bgs = feet below ground surface
mg/L = milligrams per liter
ND = Non Detect

1. Figure includes active wells found in the Shallow Zone of the Alluvial Aquifer in which groundwater was encountered within 80 ft bgs and which occur in or are within close proximity to phreatophyte vegetation communities. Well ID list from Table B-1 - Drilling and Well Construction Summary for RFI/RI Characterization (Appendix B, RFI/RI Vol. 2, CH2MHILL, 2008).
2. ND indicates COPC was not detected during sampling events.
3. † Values from Table 3-FP Primary Parameters, First Quarter 2009 Groundwater Monitoring Report (ARCADIS, 2009)
4. Extent of vegetation communities from Figure 6 of the Programmatic Biological Assessment for Pacific Gas and Electric Topock Compressor Station Remedial and Investigative Actions report (CH2MHILL, 2007).

PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

GROUNDWATER HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

MAXIMUM COPC CONCENTRATIONS IN WATER TABLE WELLS AND POTENTIALLY EXPOSED VEGETATION

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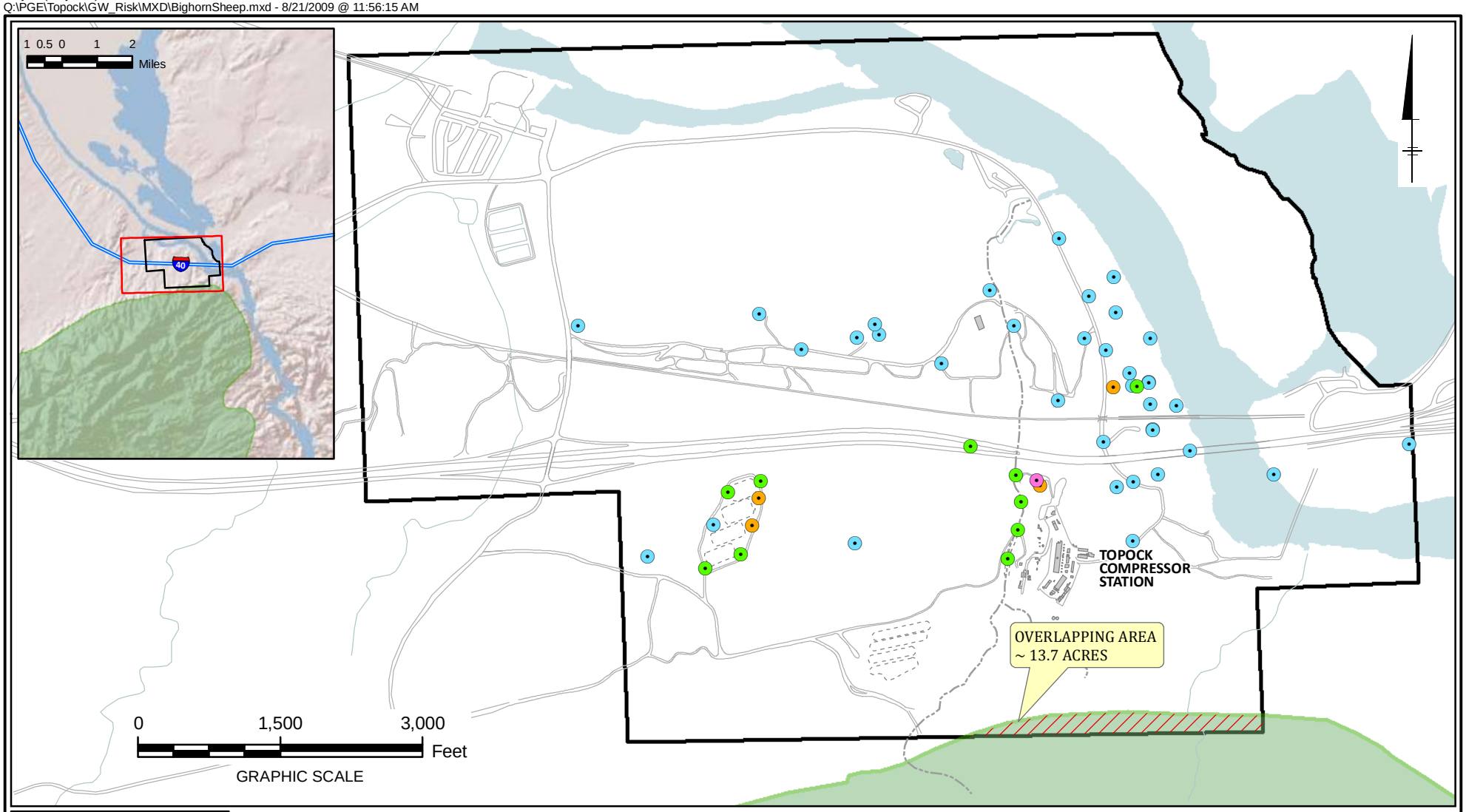
FIGURE 2

[MC-85 VJR] SANF-85 EGH
Project (RC000689.0002 Task 2)
Q:\PGETopock\GW_Risk\MXD\MaxDetectedCOPECs_v2.mxd - 8/28/2009 @ 11:27:19 AM

CITY: DIV/GROUP: DB: LD: PIC: PM: TM: TR:
Project (Project #)
Q:\PGE\Topock\GW_Risk\MXD\BighornSheep.mxd - 8/21/2009 @ 11:56:15 AM



LEGEND:

DISSOLVED NITRATE CONCENTRATIONS IN SHALLOW AQUIFER
- <5.03 mg/L (or ND)
- 5.03 - 10 mg/L
- 10.1 - 19.9 mg/L
- >20 mg/L

NELSON'S BIGHORN SHEEP (*O. CANADENSIS NELSONI*) OCCURRENCE

AREA OF POTENTIAL EFFECTS

BUILDINGS

NOTES:
HOME RANGE DATA OBTAINED FROM THE CALIFORNIA NATURAL DIVERSITY DATABASE (CNDDB, CALIFORNIA DEPARTMENT OF FISH & GAME)

PG&E TOPOCK COMPRESSOR STATION
NEEDLES CALIFORNIA

GROUNDWATER HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

NELSON'S BIGHORN SHEEP OCCURRENCE VERSUS NITRATE IN SHALLOW GROUNDWATER

ARCADIS

FIGURE
3

Appendix S – Item 21

From: Pamela_Innis@ios.doi.gov [mailto:Pamela_Innis@ios.doi.gov]
Sent: Tuesday, September 08, 2009 2:23 PM
To: Kellogg, Lisa; YJM1@pge.com
Cc: Aaron.Yue@dtsc.ca.gov; kbaker@dtsc.ca.gov; Carrie_Marr@fws.gov; Smith, Jeffery B; Cathy_Wolff-White@blm.gov; Richard Newill; DAWN.M.PETERSON@saic.com
Subject: Re: FW: Response to DOI's August 3rd Comments

DOI has had the opportunity to review the responses presented below and we have no further questions.

Pamela S. Innis
DOI Topock Remedial Project Manager
Office of Environmental Policy and Compliance
U.S. Department of Interior
P.O. Box 25007 (D-108)
Denver, CO 80225-0007
Voice: 303.445.2502
Fax: 303.445.6320
Cell: 303.501.5685

From: "Kellogg, Lisa" <Lisa.Kellogg@arcadis-us.com>
To: "Pamela_Innis@ios.doi.gov" <Pamela_Innis@ios.doi.gov>
Date: 09/04/2009 12:58 PM
Subject: FW: Response to DOI's August 3rd Comments

Pam,

I just wanted to check in with you to see if DOI has had a chance to review these last few responses to comments on the Groundwater Risk Assessment. Please let me know if you have any questions.

Also, Yvonne wanted me to remind you that we are not having our DTSC/DOI call this Tuesday.

Thanks and have a great long weekend.

-Lisa

Appendix S – Item 22

From: Aaron Yue <AYue@dtsc.ca.gov>
To: Lisa.Kellogg@arcadis-us.com <Lisa.Kellogg@arcadis-us.com>; Christina.Hong@CH2M.com <Christina.Hong@CH2M.com>; Meeks, Yvonne J
Cc: James Eichelberger <JEichelb@dtsc.ca.gov>; Karen Baker <KBaker@dtsc.ca.gov>; Carrie-Marr@fws.gov <Carrie-Marr@fws.gov>; Pam Innis <Pamela_Innis@ios.doi.gov>
Sent: Wed Sep 16 17:27:25 2009
Subject: PG&E: Final Eco Tox Memo for GWRA

Greetings,

Attached is the final comment memo from Dr. Eichelberger transmitting three specific comments on the draft GWRA Appendix X. The draft Appendix X was forwarded to Dr. Eichelberger on August 28, 2009 for review and comment. The comments were discussed between Dr. Eichelberger and Ms. Kimberly Walsh of Arcadis and the issues were further clarified during a DTSC, DOI and PG&E Coordination Meeting on September 9, 2009.

The only remaining issue is for PG&E to provide supporting documentation that there is low population of plants which may uptake contaminated groundwater, and low population of receptors that would feed on those plants. As discussed, DTSC does not expect PG&E to present a substantial rewrite of the GWRA or the appendix aside from insertion of the supporting statements and figure. It is anticipated that PG&E can proceed with preparation of the redline, strike-out version of the GWRA without delay. DTSC notes that PG&E will require three weeks for the production of the redline revision but will attempt to submit the document early. PG&E will also provide an advanced notification on the anticipated availability of the redline to coordinate its review. DTSC looks forward to the completion of the GWRA report.

If you have any questions regarding the attached memo or direction from DTSC, please do not hesitate to contact me. Thank you.

Attachments:

Topock 9-10-09 Corrected Final.pdf

Aaron

Department of Toxic Substances Control

Linda S. Adams
Secretary for
Environmental Protection

Maziar Movassaghi
Acting Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Arnold Schwarzenegger
Governor

MEMORANDUM

TO: Aaron Yue
Senior Hazardous Substances Engineer
Geology, Permitting and Corrective Action Branch
Department of Toxic Substances Control (DTSC)
Cypress, CA 90630

FROM: J. Michael Eichelberger, Ph.D.
Staff Toxicologist
Human and Ecological Risk Office
Ecological Risk Assessment Section

DATE: September 10, 2009

SUBJECT: PACIFIC GAS AND ELECTRIC COMPANY APPENDIX X – SUPPLEMENTAL ECOLOGICAL RISK EVALUATION TO ADDRESS HERD COMMENTS DATED JUNE 17, 2009, DRAFT FINAL GROUNDWATER HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA

PCA: 22120 SITE CODE: 540015-48 MPC: 44

Background

The PG&E Topock facility entered service in 1951 as a compressor station for pipelines delivering natural gas from production fields in the southwestern United States to the PG&E service area in the Southern California. Facility operations include compression of natural gas, cooling of the natural gas and lubricating oil, wastewater treatment, and equipment and facility maintenance. From 1951 to 1985, hexavalent chromium (CRVI) was added to cooling water to control biological growth, limit scale and reduce corrosion. Initially (i.e., 1951-1964), untreated wastewater containing CRVI from the

cooling towers (i.e., blowdown) was discharged directly to Bat Cave Wash. In 1964, the waste water was treated and CRVI was reduced to trivalent chromium (CRIII) prior to discharge. In 1969 unlined percolation beds were constructed in Bat Cave Wash to receive the treated wastewater. Wastewater discharge to Bat Cave Wash ceased in 1970 when PG&E began disposing of treated wastewater containing CRIII via injection wells to a depth of 450 below ground surface (bgs). PG&E discontinued the use of discharge to injection wells in 1973 and began discharging treated wastewater to four, single lined evaporation ponds located 1,600 feet west of the compressor station. In 1985, PG&E discontinued the use of CRVI-based water cooling additives and instead began using phosphate-based products in the cooling towers. Impacts from site related releases of Chemicals of Potential Ecological Concern are being investigated through both a soils and a groundwater risk assessment.

The Human and Ecological Risk Office provided comments to the Draft Groundwater Human Health and Ecological Risk Assessment, Pacific Gas and Electric Company, Topock Compressor Station, Needles, California in a memorandum dated March 30, 2009. Appendix X is PG&E's response to those comments. The Human and Ecological Risk Office participated in a conference call on Wednesday September 9th 2009 to discuss Appendix X and the comments contained below are directed at the three agreements the Human and Ecological Risk Office believes were agreed to during that conference call. The comments in this memorandum pertain only to those portions of the report dealing directly with the Groundwater Ecological Risk Assessment.

Document Reviewed

HERD reviewed "Pacific Gas and Electric Company Appendix X – Supplemental Ecological Risk Evaluations to Address HERD Comments dated June 17, 2009 Draft Final Groundwater Human Health and Ecological Risk Assessment Topock Compressor Station, Needles, California," hereafter referred to as the report was prepared by Arcadis (Walnut Creek, California) and dated August, 2009. HERD received the report for review via electronic mail on August 28, 2009.

Scope of the Review

The report was reviewed for scientific content related to ecological risk assessment. Grammatical or typographical errors that do not affect the interpretation of the text have not been noted.

General Comments

In general, Appendix X satisfactorily addresses ecological risk assessment goals of the Groundwater Ecological Risk Assessment. As discussed in the August 28, 2009 conference call a remaining outstanding issue is potential hazard to herbivorous receptors feeding on phreatophytic plants exposed to chromium VI in groundwater. It was agreed that exposure to bighorn sheep would be evaluated qualitatively; largely on the basis of the very limited time bighorn sheep may be on site. It was further agreed

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that any quantitative analysis of hazard would be deferred to the soil ecological risk assessment whereby the contribution from dietary exposure to the Merriam's kangaroo rat from feeding on phreatophytic plants would be added to the calculation of average daily dose. By deferring a quantitative hazard assessment, the completion of the Groundwater Ecological Risk Assessment will not be delayed yet possible contributions of potential hazard from chromium VI in groundwater via plants to herbivorous mammals will be accounted for.

Specific Comments

1. Page 4, Shallow-Rooted Wetland Vegetation. The Human and Ecological Risk Office, believes one thing needed in the report to support the supposition that there is no exposure to shallow rooted plants of site-related Chemicals of Potential Ecological Concern (COPECs) from groundwater is a figure illustrating the plume boundaries relative to the location of the shallow rooted plants.

2. Page 6, Section 3.3, Ruminant Ingestion of Plant Tissue. The Human and Ecological Risk Office accepts the evidence presented in Appendix X that the potential hazard to bighorn sheep from foraging on site plants exposed to nitrate from ground water, is not significant and does not believe that further evaluation of this pathway is needed.

Conclusions

The Human and Ecological Risk Office believes that addressing the three issues described in the General and Specific Comments as outlined in this memorandum, the Ground Water Ecological Risk Assessment will have adequately addressed potential hazard from site related groundwater COPECs to ecological receptors at the PG&E Topock facility. The Human and Ecological Risk Office looks forward to reviewing the Final Groundwater Human Health and Ecological Risk Assessment.

Reviewed by: James M. Polisini, Ph.D.
Staff Toxicologist

Cc: Gerald a. Pollock, Ph.D., D.A.B.T
Senior Toxicologist

Carrie Marr
U.S. Fish and Wildlife Service
Environmental Contaminants
Arizona Ecological Services Field Office
2321 W Royal Palm Rd., Suite 103
Phoenix, Arizona 85021

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Appendix S – Item 23

>>> "Meeks, Yvonne J" <YJM1@PGE.COM> 9/17/09 9:13 PM >>>

Aaron,

Thank you for providing Mike's comments and your summary of the remaining issue. We appreciate DTSC's effort to work with us to complete the GWRA on schedule. We believe we understand Mike's memo and would like to request your confirmation on the following scope clarification for the remaining evaluation:

- PG&E will expand the exposure assessment in Appendix "X" to more clearly evaluate the extent of overlap between phreatophtyes and hexavalent chromium in groundwater (greater than the background UTL). PG&E will complete the work by:
    - Adding figure showing the extent of the plume in shallow groundwater and the location of phreatophytes.
    - Providing a qualitative assessment of phreatophytes (potentially exposed to hexavalent chromium in groundwater) as a food source for herbivorous mammals (i.e., desert bighorn sheep and herbivorous small mammals such as Merriam's kangaroo rat).
    - Attempting to locate and include information characterizing the potential uptake of hexavalent chromium by phreatophytes (similar to data obtained for nitrate).

  Based on the foregoing, PG&E will make a conclusion about the likelihood that this exposure pathway is significant. At this point, we believe an assessment of plant or herbivorous mammal population size is not warranted and will introduce new problems. That information was not requested in Mike's comments, it is subjective (low relative to typical desert habitat or low relative to other habitats), and these sorts of generalizations have been the subject of FMIT and USFW comments in the past. No quantitative risk assessment for herbivorous mammals potentially exposed to hexavalent chromium via ingestion of plants will be included in the GWRA. This effort, if warranted, will be deferred to the soil ecological risk assessment where the contribution from dietary exposure to the Merriam's kangaroo rat from feeding on phreatophytic plants would be added to the calculation of average daily dose.

- PG&E will expand the exposure assessment in Appendix "X" to more clearly evaluate the extent of overlap between wetland/marsh plants and hexavalent chromium in groundwater (greater than the background UTL). This will be included on the figure mentioned above.

Please provide your confirmation of our understanding of the remaining scope. Thank you.

Yvonne

Appendix S – Item 24

From: Aaron Yue [mailto:AYue@dtsc.ca.gov]
Sent: Monday, September 21, 2009 4:40 PM
To: Pam Innis; Yvonne J Meeks
Cc: Walsh, Kimberly; Kellogg, Lisa; Christina.Hong@CH2M.com; James Eichelberger; Karen Baker; Carrie-Marr@fws.gov
Subject: RE: PG&E: Final Eco Tox Memo for GWRA

Yvonne,

Mike finds your proposed COPECs to be acceptable as listed.

Aaron

>>> "Meeks, Yvonne J" <YJM1@PGE.COM> 9/21/09 12:06 PM >>>
Thanks Aaron. One final item to confirm with you on your email below -- by COPEC do you mean the hex chromium, nitrate, selenium, and moly? Is that correct?

From: Aaron Yue [mailto:AYue@dtsc.ca.gov]
Sent: Monday, September 21, 2009 9:38 AM
To: Pam Innis; Meeks, Yvonne J
Cc: Lisa.Kellogg@arcadis-us.com; Christina.Hong@CH2M.com; James Eichelberger; Karen Baker; Carrie-Marr@fws.gov
Subject: RE: PG&E: Final Eco Tox Memo for GWRA

Yvonne,

That is almost correct. I think Mike and I are fine not introducing herbivorous mammal population size. I thought that was part of the logic train during the September 9 discussion... but we are okay with out it. The only issue I see with your summary is that only hexavalent chromium is referenced. We have to assure the other COPECs are discussed qualitatively in the same manner as hexavalent chromium... of which we know are very localized and unlikely to be an issue.

I hope this completes all of PG&E's need to finalize the GWRA. Let me know if you need additional discussion.

Aaron

Item 25 – Appendix S

From: Pamela_Innis@ios.doi.gov
To: Meeks, Yvonne J
Cc: Aaron.Yue@dtsc.ca.gov ; Carrie-Marr@fws.gov ; Christina.Hong@CH2M.com ; Gilbert, David ; Kellogg, Lisa; Cathy_Wolff-White@blm.gov ; Smith, Jeffery B ; Richard Newill ; tmssinc@comcast.net
Sent: Wed Oct 07 08:24:45 2009
Subject: Re: DOI-CMS direction needed on East Ravine Risk Evaluation

Yvonne,

Your assessment is correct. It is not our expectation that the East Ravine risk evaluation be included in the CMS/FS. As noted below, it is DOI's expectation that an addendum to the Groundwater Risk Assessment be prepared for East Ravine. In order to prepare the evaluation, it is important to attain sufficient groundwater data, presumably including data from any additional wells installed as part of the ongoing investigation.

Pamela S. Innis
DOI Topock Remedial Project Manager
Office of Environmental Policy and Compliance
U.S. Department of Interior
P.O. Box 25007 (D-108)
Denver, CO 80225-0007
Voice: 303.445.2502
Fax: 303.445.6320
Cell: 303.501.5685

From: "Meeks, Yvonne J" <YJM1@PGE.COM>

To: <Pamela_Innis@ios.doi.gov>

Cc: <Carrie-Marr@fws.gov>, <Aaron.Yue@dtsc.ca.gov>, "Gilbert, David" <DAG6@PGE.COM>, <Christina.Hong@CH2M.com>, <Lisa.Kellogg@arcadis-us.com>

Date: 10/05/2009 11:22 AM

Subject: DOI-CMS direction needed on East Ravine Risk Evaluation

Pam –

I wanted to circle back on recent discussions/emails regarding PG&E's risk evaluation for East Ravine. Based on the facts that there is only one complete round of groundwater data, and characterization is continuing, PG&E believes that the best approach is to not include the screening-level analysis in the

East Ravine Appendix to the CMS/FS. I am concerned that putting this new material in the CMS at this point in the process may slow the CMS down and anticipate the evaluation will need to be repeated later anyway when more data has been collected. PG&E would recommend that the screening-level analysis be prepared after the East Ravine data collection is complete and that information is included in a separate document, perhaps a Technical Memorandum. I think that's a better approach.

To refresh your recollection, here's the paper trail. Below is DOI initial direction (which was included in your August 3 response to our RTC on DOI SC7).

Accept under Provision.
Provision
It is DOI's expectation that PG&E will prepare for review and approval a GWRA Addendum addressing items such as the East Ravine and other studies not yet identified that may be necessary. It is also our expectation that any findings arising from the soils investigation impacting groundwater be included in an GWRA addendum or the soil risk assessment.

<<DOI Responses to the proposed PG&E GWRA RTC>>
We had two phone calls in mid-August (which I am not sure if I participated it, I was just getting back from vacation). The final email from PG&E on this topic was dated August 25, 2009, were we stated that we would be including the screening-level analysis in the East Ravine Report that is going to be an Appendix to the CMS/FS. Excerpted from PG&E email:

"We discussed the East Ravine data, and how the implications of the data on the risk assessment will be presented in the East Ravine Report, which will be an Appendix to the CMS/FS. We discussed that we will be presenting a screening-level analysis in the East Ravine Report, in which we identify the compounds detected in the East Ravine groundwater monitoring, discuss the range of concentrations detected, and then provide the rationale as to why the data from the East Ravine do not change the conclusions of the GWRA."

<<Response to DOI's August 3rd Comments>>
Both these documents are attached. Let me know if you concur with the approach outlined or would like to discuss further.

Thank you, Yvonne

Item 26 – Appendix S

Pacific Gas and Electric Company

Yvonne Meeks
Senior
Environmental Geologist
Environmental Services

Mailing Address
4325 South Higuera Street
San Luis Obispo, CA 93401
Location
6588 Ontario Road
San Luis Obispo, CA 93405
Tel: (805) 546-5243
Email: yjm1@pge.com

12 October 2009

Mr. Aaron Yue
Chief Permitting Unit
California Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630

Subject: Response to FMIT Supplemental Comments on the draft *Groundwater Risk Assessment for Topock Compressor Station*
Pacific Gas and Electric Company
Topock Compressor Station
Needles, California

Dear Mr. Yue:

Pacific Gas and Electric Company (PG&E) and its consultants (ARCADIS) submit this letter in response to the Fort Mojave Indian Tribe (FMIT) comments provided by Michael J. Sullivan, Ph.D., CIH, in a letter to you dated July 10, 2009. These supplemental comments were provided on PG&E's Response to Comments on the *Draft Groundwater Human Health and Ecological Risk Assessment*, dated May 29, 2009. PG&E and ARCADIS have considered each of the concerns raised and provide the responses in subsequent paragraphs.

We have reprinted each of the original comments and supplemental comments, and our response to each comment is provided immediately following the comment.

FMIT GC1 – Original Comment

Sequencing of Project Reports. The overall timing of the various deliverables for the Topock project is out of proper sequence according to Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental, Response, Cleanup, and Liability Act (CERCLA) guidance. The draft Corrective Measures Study/Feasibility Study (CMS/FS) report for chromium in groundwater was submitted on January 27, 2009. This was followed by the GWRA risk assessment (focus of this review). In practice, the GWRA is the basis for the CMS/FS. However, even the GWRA was delivered only a very short time after the finalization of the risk assessment work plan (RAWP) addendum was published. DTSC management should insist on an

appropriate report delivery order and schedule for future deliverables. The ability of the Tribe to provide appropriate and meaningful comments on these documents would be helped by a proper delivery schedule.

FMIT GC1 – Supplemental Comment

The response simply refers to the project schedule. CERCLA and RCRA documents should follow a logical order: characterization, risk assessment, remediation feasibility, and then remediation implementation. When documents are prepared and provided out of sequence, however, the review process is disrupted. For example, the groundwater FS should not be completed until the GWRA is finalized. An additional concern is that the illogical order of reports may have resulted in an agency recommendation to address Tribal comments in some future report but not the appropriate update of the reviewed report. This just perpetuates erroneous assumptions and faulty text. It is DTSC's responsibility as the lead regulatory agency to ensure that documents are provided in the correct order and with sufficient time for meaningful comment. DOI comment SC 16 reiterates the basic premise of our position that the documents must be presented in a comprehensive format and appropriate order so that full reviews can be completed. Additionally, the response to DOI comment SC 7 (among others) suggests that updates to the GWRA will only be evaluated in an addendum and not as an updated GWRA. The complete GWRA must be reissued so that reviewers have a complete and comprehensive document to review rather than multiple documents.

PG&E Response FMIT GC1 – Supplemental Comment

Comment noted. Although the documents for the Groundwater Risk Assessment (GWRA) and the CMS/FS are being produced on a parallel track, the agencies and PG&E agree that the GWRA should be completed first so that the conclusion of the GWRA is properly reflected in the CM/FS for evaluation. Please note that in practice, the GWRA will be completed before the CMS/FS. The schedule was established as one strategy to expedite the implementation of the groundwater remedy. Providing some paralleling of progression under the CERCLA and RCRA processes expedites implementation of a remedy for the groundwater conditions. Consequently, the GWRA and CMS/FS are being produced on staggered and parallel tracks as a way to expedite the process. Consistent with the regulatory process, the GWRA is being completed before the CMS/FS so that conclusions of the GWRA are incorporated into the CMS/FS. In addition, comments from all stakeholders are being received, considered, and resolved prior to finalizing any document.

Data collection at the site is ongoing. Therefore, one or more addenda to the GWRA are anticipated. An addendum or supplemental evaluation of groundwater and potential risk will serve as an update to information already presented in the GWRA. In an addendum, evaluation of new data will be discussed, and then the new findings and conclusions integrated with a discussion of the previous GWRA findings and conclusions to provide a comprehensive update. If new findings change the original conclusions of the GWRA, that will be made clear and appropriate references and citations provided for prior documents.

FMIT GC2 – Original Comment

Description of Ecosystem. The report provides several broad statements regarding terrestrial wildlife. For example, the text states that terrestrial wildlife has 'low diversity' because the area is disturbed and the wildlife corridor is incomplete (pg 2-3, pp2), the BCW is 'relatively barren of vegetation' (page 2-3, pp3) and that only 'small patches of emergent vegetation exist along the banks of the Colorado River' (page 2-3, pp2). These text descriptions do not accurately reflect the ecosystem at and including the site. The Tribe's view is that the local desert ecosystem and plant/animal life are worthy of protection, especially when the cumulative land disturbance impacts of both groundwater and soil remediation activities are considered and when a less transitory view of animal and plant life usage is considered. Second, the area surrounding and adjacent to the remediation include areas designated as wildlife refuges, thereby showing that at least the federal government understands the nature of area's typical desert environment. Third, this text does not address any plants at the site that the Tribe considers important for ceremonial or medicine purposes. Both Mesquite and Creosote plants are related to Tribal activities at the site and are harvested for its sacred and Tribal uses of this area.

FMIT GC2 – Supplemental Comment

The intent of my comment was to have the GWRA, and all subsequent reports, contain language that describes and acknowledges the significance of the local ecosystem (both river and upland areas) as well as the unique and significant relationship between Tribal culture and the environment. Neither the original text nor the suggested edits accurately address this important issue. DOI's comment SC 11 reiterates the Tribe's concerns regarding the inappropriate description of the desert environment. We request that PG&E provide the entire updated text from this section so the entire text can be reviewed with the added sentences.

PG&E Response FMIT GC2 – Supplemental Comment

PG&E concurs that the local desert ecosystem is worthy of protection and is proposing the following text revisions to more clearly reflect that position. The following sentence will be inserted as the first sentence of paragraph 2 on page 2-3: "Upland areas of the APE include the Havasu National Wildlife Refuge, which was established to protect and conserve wildlife." The text on page 2-3 in paragraph 2 regarding terrestrial wildlife diversity will be replaced with "Terrestrial wildlife found at the site is adapted to the interrelated conditions of drought, temperature extremes, and the sparse or unpredictable food supply of the desert habitats found at the site. Adjacent natural barriers such as the Chemehuevi Mountains and Colorado River interrupt a continuous terrestrial wildlife corridor for many species." The text on page 2-3 in paragraph 3 regarding the distribution of vegetation in Bat Cave Wash will be replaced with "BCW consists of areas of unvegetated sand, gravel, and cobblestone substrate interspersed with widely spaced desert wash vegetation including mesquite and creosote." The text on page 2-3 paragraph 4 regarding small patches of emergent vegetation will be expanded to include "…such as common reed (*Phragmites communis*), cattails (*Typha* sp.), sedges (*Carex* sp.), and bulrush (*Scirpus* sp.),…" to focus and better define the discussion.

Existing Section 2.3 acknowledges that the land holds important spiritual meaning for the FMIT. Please see also response to FMIT GC3 below for additional language to be incorporated into this section.

FMIT GC3 – Original Comment

<u>Description of Tribal Interests in Maze Area</u>. There is only a single sentence that identifies the Topock area as having spiritual meaning to the Tribes. The Tribe reiterates its request that the following text be used in project documents to describe the relationship of the land with the tribal cultural and spiritual values.

> *"The compressor station is located in a sparsely-populated, rural area, comprising a series of benches and terraces overlooking the Colorado River floodplain. The land surrounding and including the compressor station, including the benches and terraces on both sides of the river, the floodplain, the river itself, and the surrounding hills and mountains, comprises a cultural landscape that figures importantly in the traditional spiritual and cultural life of the Aha Makav or Fort Mojave Indian Tribe. One important component of this landscape, known as the Topock Maze, directly surrounds and includes the compressor station. The Maze is a complex of windrows raked in the desert pavement, running in several directions for many tens of meters. Although portions of this site have been disturbed by construction and unsympathetic land use (as have some other parts of the cultural landscape surrounding and including it), the Maze and its surroundings continue to play significant roles in the lives and cultural beliefs of the Fort Mojave Indian Tribe and other tribes along the Colorado River. The Fort Mojave Indian Tribe has expressed the opinion that whatever happens in the overall cultural landscape is of concern to the Tribe, which wishes to be consulted about all activities planned or proposed in the area."*

In addition, the text lists the current river recreational activities as sightseeing, bird watching, fishing, hunting, camping and canoeing (pg 2-5, pp5). Other activities Tribal members have observed include tubing, rafting, sunning, swimming and tours. However, there are also Tribal activities along the river shoreline that are related to the religious, cultural, and ceremonial activities (as opposed to public recreation). These activities are an integral and necessary component of Tribal culture and must therefore be considered by risk managers.

FMIT GC3 – Supplemental Comment

The response to comments does not fully address the Tribe's position that the land, the Maze, the River, etc. (all inter-related areas of the landscape) are significant, sacred and all tied intimately to the Tribe's culture. DTSC must insist that the GWRA and future documents include the recommended language provided by the Tribe. Risk managers need to have full and accurate descriptions of the Tribal interests in the site and surrounding land in order to make appropriate

remediation decisions. DOI comment SC 12 also notes that the GWRA's reference to Tribal areas are incomplete or inaccurate. Why do DTSC and PG&E continue to refuse to include text provided by the Tribe? It is the Tribe's view that this text should be included in <u>all</u> project reports.

PG&E Response FMIT GC3 – Supplemental Comment

This comment is similar to a comment received by FMIT on the Revised Final RFI/RI Volume 2 Report (February 2009). As previously indicated by DTSC in their October 21, 2008 letter to PG&E,

> "DTSC believes the statements currently in the Volume 2 RFI Report reflect the importance of the area to all tribes. Additional clarifications and cultural significances of the area by specific Native American Tribes should be a topic of documentation for the upcoming Environmental Impact Report."

PG&E acknowledges and appreciates that there is a unique and significant relationship between Tribal culture and the environment. However, the purpose of the GWRA is to provide quantitative risk assessment in a manner that follows standard regulatory guidance. The unique nature of the Tribe's relationship to the environment may not be fully addressed in the regulatory quantitative risk evaluation process. Fortunately, the GWRA is not the only input for risk management decisions; it is one of several tools for risk managers to consider in their decisions for this project. The EIR is another key tool for risk managers to consider, and under the regulatory framework, the Tribal concerns for impacts to their sacred environment are more appropriately addressed by the EIR. Therefore, the final GWRA will incorporate the same language regarding tribal cultural and spiritual values as that used in the RFI Volume 2. Specifically, the following language will be added to the GWRA for consistency with the RFI Volume 2:

> "The compressor station is located in a sparsely-populated, rural area. The surrounding land lies within an area of significant cultural and sacred tribal resources. Portions of the Topock Maze are located nearby. The maze is a geoglyph (ground marking) and is of importance to the local Native American community. The area is within the traditional territory of the Aha Makav or Mojave tribe. While the material remains of the past are important to these tribes, this area of traditional and spiritual use knows no boundaries for the Mojave."

As indicated in the RAWP, a tribal use scenario will be included in the soil risk assessment considering input to be provided by the Tribes for their religious, cultural, and ceremonial activities. In accordance with the RAWP, the GWRA determined that the river has not been adversely impacted by site COPCs. Therefore, Tribal activities along the river shoreline related to the religious, cultural, and ceremonial activities that include contact with the surface water are not adversely impacted by the site COPCs.

FMIT GC4 – Original Comment

Future Land Uses. *There are future land-use issues in the GWRA that need to be clarified. First, DOI has requested that a stretch of the floodplain area along old Route 66 be evaluated for potential future scenario involving the development of housing and recreational areas (pg 2-6, pp5). This results in the risk assessment assumption of future residential use of groundwater produced from local wells. This proposed future land use scenario poses Tribal concerns, especially if such development were to occur in the vicinity of the Maze. In a separate letter, the Tribe will provide text that describes appropriate land uses for this area.*

Second, the future ownership of the IM land as well as potential repatriation of the Topock Compressor site to the Tribe is not mentioned. The potential for future control of these lands by the Tribe further increases the importance of current Tribal concerns regarding protecting the land as well as defining future land uses that should be evaluated in the GWRA.

FMIT GC4 – Supplemental Comment

FMIT –GC4 – the response to comments addresses many of the issues raised in my comments but does not propose to update the text to include the descriptions of the Tribe's future interests in the IM3 and Topock compressor sites. DTSC must insist that the GWRA and future documents include recommended language provided by the Tribe. Risk managers need to have full and accurate descriptions of the Tribal interests in the site and surrounding land in order to make appropriate remediation decisions. Why to DTSC and PG&E continue to refuse to include text provided by the Tribe? It is the Tribe's view that this text should be included in all project reports. It is further interesting that in comment SC4, DOI requests removal of any reference to its request for evaluating potential future residential development. If the basis for the inclusion of the residential receptor was based on the DOI request, then DOI's withdrawal of its comment should result in the exclusion of the residential receptor. This DOI position seems to be further stated in its comment SC 13 where it cites the appropriate criteria to be used in selecting future land and resource (i.e. groundwater) uses. What is the rationale for not honoring DOI's request to remove the residential receptor?

PG&E Response FMIT GC4 – Supplemental Comment

The future land use discussion in the GWRA is based on assumptions regarding current and future land use, as provided by the agency and the landowner (USDOI, 2007), for lands outside the compressor station. DOI's comment SC4 requested that the statement in the GWRA that future residential use is "unlikely" be removed from text. It is PG&E's understanding, however, that DOI continues to request an evaluation of residential land use and that Section 2.3.2 as drafted is acceptable to and consistent with DOI direction. PG&E acknowledges that the assessment as proposed would reflect worst-case potential land use and may not reflect actual land use in the future. As a result, PG&E has not amended the text to remove reference to residential use as requested.

As we have previously stated, we believe that the currently proposed land uses and receptors will provide the risk managers with the necessary risk assessment information to make informed management decisions for the spectrum of known and anticipated future land uses for all areas of the site. However, PG&E recognizes the FMIT request for a Tribal-use scenario and will address such a scenario that would be representative of the FMIT's use of the land, including for the Interim Measure (IM-) 3 property, as indicated in the RAWP as part of the soil risk assessment.

For groundwater, residential potable use of groundwater is typically considered to be the upper bound (i.e., most conservative) use pattern for groundwater. The default exposure scenario represented in the GWRA assumes that groundwater is the only source of potable water and it is used for a lifetime. The GWRA evaluates this intense, daily contact with groundwater on a well-by-well basis. Concentrations that are health protective for unrestricted potable drinking water use for each well would also be health protective for other or additional Tribal activities that may include direct contact with groundwater.

Appropriate references to the FMIT as owner of the IM-3 property in the future will be included in the final document, pending completion of the title transfer. The following proposed language will be inserted in GWRA text section 2.3.2 to clarify potential Tribal future interests in the IM3 and compressor station properties consistent with prior settlement agreements:

> "It is anticipated that title to the IM3 property will be transferred to the Ft. Mojave Tribe in 2009. The transfer is part of a global settlement of litigation brought by the FMIT against DTSC. As part of the property transfer, PG&E will maintain a site wide easement over the IM3 property for siting of any facilities required by DTSC or the USDOI. Implementation of IM3 is expected to continue until a final corrective action/remedial action for the site is operating properly and successfully, and the regulatory agencies terminate the requirement for the IM. For the compressor station, PG&E is the landowner, and use for the foreseeable future will continue to be industrial. If ever there is a need/desire to change the use, additional evaluations would have to be conducted at that time to address planned use. There is no agreement that will transfer this property. However, FMIT may exercise its option to purchase the property at its fair market value in the then existing condition when the facility is shut down, and when PG&E has no further use for the property for any utility purpose, or for remediation related purposes."

Thank you for providing the FMIT supplemental comments on the Draft GWRA. If you have any questions regarding this letter, please call me at (805) 234-2257.

Sincerely,

Yvonne Meeks

Yvonne Meeks
Topock Project Manager

cc: Kris Doebbler, DOI
Mike Eichelberger, DTSC
Shukla Roy-Semmen, DTSC
Carrie Marr, USFWS
Karen Baker, DTSC
Dennis Smith, SAIC

Department of Toxic Substances Control

Linda S. Adams
Secretary for
Environmental Protection

Maziar Movassaghi
Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

Sent Via Email

October 28, 2009

Ms. Yvonne Meeks
Portfolio Manager – Site Remediation
Pacific Gas and Electric Company
4325 South Higuera Street
San Luis Obispo, CA 93401

REVIEW OF REDLINE STRIKEOUT VERSION OF FINAL GROUNDWATER RISK ASSESSMENT REPORT, TOPOCK COMPRESSOR STATION, NEEDLES, CALIFORNIA (EPA ID NO. CAT080011729)

Dear Ms. Meeks,

The Department of Toxic Substances Control (DTSC) has reviewed the red-lined strike out (RLSO) version of the *Human and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2* report. As a result of our review, DTSC concurs with the overall conclusion that hexavalent chromium is the predominant risk driver, however, DTSC has comments that warrant your attention as well as require specific changes to the final report.

1) In the text of the original document, PG&E called out all individual wells with HIs >= 1. In the RLSO, only wells with Hazard Indexes (HIs) > 1 were called out in the main text, thereby reducing the total number of wells that were flagged per COPC. For example, for nitrate, the number of wells flagged dropped from five wells to one well. However, DTSC agrees that the well by well risk calculations are appropriately conducted and no change to the document is required.

2) In the RLSO, only hexavalent chromium was identified as COC. The other three COPCs with HIs >1 (in individual wells) were not called out in the COC list. DTSC believes that molybdenum, selenium and nitrate do represent a component of the total risk at specific locations where their individual HIs exceeds 1. Although these substances may not require an active remediation beyond monitoring, it is DTSC's position that they should be tracked as COCs in the CMS/FS. PG&E, however, will not

be required to develop numeric remedial action objectives in the CMS/FS for these COCs at this time.

3) With respect to the ecological assessment component of the RLSO, DTSC agrees with the overall conclusions of the report and does not view the groundwater plume as posing a significant hazard to ecological receptors at this time. Never the less, DTSC requests that one paragraph within Appendix I be stricken from the report.

Appendix I, Supplemental Ecological Risk Evaluation to Address HERD Comments Dated March 26, 2009; June 17, 2009; and September 10, 2009, Page 11, Section 4, Toxicity Assessment, Subsection 4.1 Hexavalent Chromium, first new paragraph (written in red ink). The report writes, '*Mammals; Eisler (1986) reports that acute and chronic adverse effects of chromium to warm-blooded organisms are caused mainly by hexavalent compounds. There is little conclusive evidence of toxic effects caused by divalent or trivalent chromium (Langard and Norseth, 1979; as cited in Eisler, 1986).* This verbiage should be removed from the text. The U.S Environmental Protection agency has presented more than adequate documentation that shows trivalent chromium as toxic to wildlife including birds and mammals. Please see table 2.1 and figures 5.1 and 6.1 of the Ecological Soil Screening Levels for Chromium Interim Final OSWER Directive 9285.7- 66, http://www.epa.gov/ecotox/ecossl/pdf/eco-ssl_chromium.pdf.

If you have any questions or comments regarding these comments, please contact me at (714) 484-5439.

Sincerely,

Aaron Yue
Project Manager
Geological Services Branch

Enclosure

aky:**100903B**

cc: See next page

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
FISH AND WILDLIFE SERVICE
BUREAU OF RECLAMATION

ELECTRONIC SUBMISSION

November 5, 2009

Ms. Yvonne Meeks
Portfolio Manager – Site Remediation
Pacific Gas and Electric Company
4325 South Higuera Street
San Luis Obispo, CA 93401

Subject: PG&E Topock Compressor Station Remediation Site – Redline/Strikeout of the Draft Groundwater Human Health and Ecological Risk Assessment

Dear Ms. Meeks:

The Department of the Interior, on behalf of itself and the Bureau of Land Management, the U.S. Fish and Wildlife Service, and the Bureau of Reclamation (collectively referred to as "DOI"), is submitting comments on the redline/strikeout (RLSO) version of the Human and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2 report. Due to unexpected circumstances, the document review was limited to a review by the U.S. Fish and Wildlife Service (FWS) and is provided in the attached memorandum, however this should be considered DOI's final review of this document.

If you have any questions regarding this transmittal or our comments, please contact me at (303) 445-2502.

Sincerely,

Pamela S. Innis

Pamela S. Innis
DOI Topock Remedial Project Manager

Attachment (1)

cc: Christina Hong, CH2MHill
Serena Lee, CH2MHill
Lisa Kellogg, Arcadis
Aaron Yue, DTSC
Dr. Shukla Roy-Semmen, DTSC, HERD
Dr. James Eichelberger, DTSC, HERD – ERAS
Karen Baker, DTSC
Carrie Marr, USFWS
Jeff Smith, BOR
Cathy Wolff-White, BLM
Rick Newill, DOI Consultant
Dawn Peterson, SAIC
Dennis Smith, SAIC

ATTACHMENT

US Fish and Wildlife Service Memo to File
Comments on the Pacific Gas and Electric (PG&E) Human and Ecological Risk Assessment (HERA) of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2 [SWMU 1/AOC 1 and SWMU 2 GWRA]

US Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, AZ 85021
(602) 242-0210

Note to the File

To: Pamela Innis,
Remedial Project Manager,
Topock Compressor Station,
Office of Environmental Policy and Compliance,
Department of the Interior

From: Carrie Marr,
Environmental Contaminant Specialist

Date: November 5, 2009

Subject: Pacific Gas and Electric (PG&E) Human and Ecological Risk Assessment (HERA) of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU 2 [SWMU 1/AOC 1 and SWMU 2 GWRA]

PG&E's red-lined/strikeout of the HERA for SWMU 1/AOC 1 and SWMU 2 GWRA, October 2009 was reviewed. Overall, the conclusions of the report are acceptable, provided the following adjustments or requests are made:

General Comments

Due to unforeseen circumstances, this document was not reviewed by a full-time human health risk assessor for DOI. The DOI human health risk assessor who previously was involved with this project specifically requested the creation of a Data Usability Matrix, as provided in Appendix E, and examples of ProUCL 4.0 Outputs, as provided in Appendix F. The number of non-detects reported in Table E-1 (Data Usability Matrix) were unacceptably high, because the Minimum Detection Limit (MDLs) was greater than the Upper Threshold Limit (UTL), Risk-based Concentration (RBC), Maximum Contaminant Level (MCL) or surface water quality criteria (WQC). My recommendation for future groundwater sampling efforts is to lower the MDLs, as technically feasible, for those trace elements that exceeded UTLs. This should occur for both the site-wide groundwater monitoring program and, more importantly, for the new wells installed during the East Ravine Groundwater Investigation. A Data Usability Matrix should be

provided to DOI for soils to ensure that MDLs are lower than threshold concentrations for the Soils Remedial Investigation. Both the regulators and PG&E should agree upon the appropriate threshold concentrations to use.

With respect to the human health risk assessor's request for ProUCL 4.0 Output Reports, these were provided as requested. However, there was insufficient time to review these due to the tight deadline.

Specific Comments

Page ES-4: Changes made to the body of the text were not carried through to the Executive Summary (e.g., 'understory of arrowweed' pg 2-4).

Page ES-4 and Page 2-3: It is inaccurate to characterize the sand, gravel, and cobblestone substrate of Bat Cave Wash as 'unvegetated' or to use 'sparse or unpredictable food supply' to describe desert habitats without supporting literature citations. The project site is typical habitat for the transition zone between the Lower Colorado River Valley Subdivision of the Sonoran desertscrub and the Mohave desertscrub biomes (Turner and Brown 1994). Turner and Brown (1994) describe drainageways in this area as being "lined by small trees and shrubs not characteristic of the drier interfluves…the plants of dendritic drainageways grow in rows along the margins of the water courses, clearly set apart from the intervening vegetation of the interfluves." Turner and Brown (1994) also describe the mammals of the Lower Colorado River Valley as "adapted to high diurnal temperatures by spending most of the day underground or aestivating. Consequently, the subdivision's sandy plains may host large populations of burrowing rodents."

The text describing the Chemehuevi Mountains and the Colorado River as barriers that, "…interrupt a continuous terrestrial wildlife corridor for many species" depends upon the animal or plant species being considered. Please change the sentence as follows: "Terrestrial wildlife found at the site is adapted to the ~~interrelated conditions of drought, temperature extremes, and the sparse or unpredictable food supply of~~ the desert habitats found at this site. Adjacent natural barriers such as the Chemehuevi Mountains and Colorado River interrupt a continuous terrestrial wildlife corridor for ~~many~~ **some** species." New text is presented in **BOLD**.

Pages ES-25, -27, etc. : This GWRA pertains to both SWMU 1/AOC 1 and SWMU 2; however, in many instances SWMU 1/AOC 1 was the only operational unit referenced. Please review the document and add SWMU 2 to the text when necessary. Examples of this omission include 1) pg ES-25, "..(2) may be associated with groundwater at SWMU 1/AOC 1 **or SWMU 2**" and 2) pg ES-27, "… (2) likely associated with groundwater at SWMU 1/AOC 1 **or SWMU 2**."

Page ES-25, the new sentence in the 3rd paragraph should be modified as follows: "**A** ~~This~~ molybdenum essential nutrient evaluation **was** conducted in addition to the standard baseline molybdenum evaluation. ~~is not a typical component of DTSC's standard risk assessment protocols."~~ Since this is also a DOI remediation and DOI does not have standard risk assessment protocols, including an essential nutrient screen is not an unusual request.

Pages ES-27, 5-1, etc: References to an 'ecological population' should be changed to 'ecological **receptors**' throughout the document.

Page 2-4: In the discussion on current land use, the significance of the HNWR surrounding the Topock Compressor Station is minimized. The Topock Compressor Station is mentioned first and then the area's importance to the Fort Mohave Indian Tribe (FMIT) is mentioned second. Although it would be preferable to see the description of the HNWR mentioned earlier, the text in the first paragraph on page 2-6 should be edited as follows: "~~A small portion of the refuge borders the compressor station.~~ **The TCS is completely surrounded by HNWR.** Also, the description of the area's cultural significance to different Tribes was not conveyed clearly. If one Tribe is specifically mentioned, then all of the Tribes for whom this area holds cultural significance should also be named individually.

Pages 5-2 through 5-3: Arcadis added new text on these pages to describe how new data collected from the East Ravine groundwater wells would be analyzed. The sentence, "A detailed quantitative risk assessment of the East Ravine groundwater data would not be necessary if detected concentrations are comparable to groundwater data previously evaluated," should be revised to "**A detailed quantitative risk assessment of the East Ravine groundwater data may be necessary depending on the results of the screening-level risk analysis**".

Page 9-13: A reopener clause should be added to Section 9 or 10. There is already text in Section 5.2 discussing how East Ravine information will be presented to us and text in Section 9 describing cumulative risks and the future soil investigation and risk assessment. However, these references to additional work needs are not sufficient given the lack of information regarding our knowledge about the nature and extent of the groundwater plume in AOC 10 (East Ravine) and AOC 4 (Debris Ravine) and the narrow scope of this groundwater risk assessment (only for SWMU 1/AOC 1 and SWMU 2). It is not clear that another groundwater risk assessment would be prepared if other contaminant source areas are found during the soils investigation. Therefore, the reopener statement should include language describing how a new quantitative human and ecological risk assessment (HERA) may be necessary if new information reveals greater nature or extent of contamination in a manner or to an extent not considered in this risk assessment. The new HERA may take the form of a technical memorandum, addendum, or as a stand-alone document.

Literature Cited

Turner, R.M. and D.E. Brown. 1994. Tropical-Subtropical Desertlands: Sonoran desertscrub. Pp 180-221. *In* Biotic Communities: southwestern United States and Northwestern Mexico. D.E. Brown (Editor). University of Utah Press. Salt Lake City, Utah.

Reviewed by: Jean Calhoun,
Deputy Field Supervisor, FWS.

cc: Ms. Pamela Innis
DOI Topock Remedial Project Manager

Dr. Shukla Roy-Semmen
DTSC, HERD

Dr. James Eichelberger
DTSC, HERD – ERAS

Ms. Karen Baker
DTSC, Performance Manager

Item 29 - Appendix S

From: Meeks, Yvonne J [mailto:YJM1@PGE.COM]
Sent: Monday, November 09, 2009 8:55 AM
To: Aaron Yue; Pamela_Innis@ios.doi.gov; Carrie-Marr@fws.gov
Cc: Kellogg, Lisa; Adrienne LaPierre; Gilbert, David
Subject: Final GWRA language, please provide comments asap

Pam, Carrie, and Aaron-

We received DOI's November 5th, 2009 comments on the redline/strikeout (RLSO) version of the *Draft Groundwater Human Health and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU2*. In general, PG&E agrees with DOI's requested changes. Below are itemized responses to your general and specific comments, as presented in your November 5, 2009 letter. Especially note underlined portions where the response is slightly modified from or an expansion of the requested language. We request DTSC review of these changes also.

General Comments
DOI has stated that the detection limits for some of the constituents in the groundwater monitoring program are elevated, and thus recommends that the detection limits be lowered for certain constituents for upcoming groundwater monitoring, particularly in the East Ravine. We note the risk assessment does discuss the implications of elevated detection limits, and the ultimate results and conclusions of the risk assessment are not materially affected by those elevated detection limits. We do believe that it will be beneficial to work with DOI as requested to ensure that current and future monitoring programs meet necessary detection limits.

DOI also recommends that a Data Usability Matrix be prepared for the soils to ensure detection limits are appropriate, and recommends that the regulators and PG&E should work together to agree upon the appropriate threshold concentrations to be used in evaluating the appropriateness of the detection limits. PG&E concurs, and notes that PG&E has been working with the agencies on the preparation of a Soils Data Quality Objectives (DQO) Memo, and will be working collaboratively with agencies to review the Phase 1 data, and identify sampling needs for Phase 2 soil sampling. A component of the data evaluation process will be to evaluate the adequacy of detection limits, in comparison to the screening levels set forth in the DQO memo.

DOI also notes that the human health risk assessor requested the ProUCL output be submitted, and states that due to the tight deadline they could not review the ProUCL output. We note that the ProUCL output was part of the original Draft GWRA, submitted in February 2009, and thus is not a new component of the revised GWRA.

Specific Comments (SC):
SC 1 (Page ES-4): PG&E will make the requested change.

SC 2 (Page ES-4 and Page 2-3): PG&E will make the requested change.

SC3 (Page ES-25, -27, etc): PG&E will make the requested change.

SC 4 (Page ES-25): PG&E incorporated the concept of this sentence at the request of DTSC to acknowledge that DTSC does not typically incorporate essential nutrient evaluations into their risk assessment process. We recommend the following sentence to satisfy DTSC request and be responsive to DOI's comment: "This molybdenum essential nutrient evaluation, conducted in addition to the standard baseline molybdenum evaluation, is not a typical component of DTSC's standard risk assessment protocols, although an essential nutrient screen is not an unusual request for DOI sites."

SC5 (Page ES-27, 5-1, etc): PG&E will make the requested change.

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SC7 (Page 5-2 – 5-3): PG&E will make the requested change.

SC8 (Page 9-13): PG&E will make the requested change in Section 9. We propose to incorporate the following text to address this comment:

"As discussed in previous sections, additional investigations are ongoing (e.g., East Ravine, AOC 4). If additional information is obtained during the upcoming investigations that suggests the impacts to groundwater are materially different in a manner not considered in this GWRA, then a supplemental human health and ecological risk assessment may be warranted. The specific form of the supplemental risk assessment will be discussed with the agencies prior to the preparation of the document, but may be in the form of an Addendum, Technical Memorandum, or stand-alone document."

We will be working to submit the final document this Friday, November 13. Please let us know if you do not agree with any of these responses ASAP.

Yvonne

From: Pamela_Innis@ios.doi.gov [mailto:Pamela_Innis@ios.doi.gov]
Sent: Tuesday, November 10, 2009 10:07 AM
To: Meeks, Yvonne J
Cc: Adrienne LaPierre; Aaron Yue; Carrie-Marr@fws.gov; Gilbert, David; Kellogg, Lisa; Cathy_Wolff-White@blm.gov; Smith, Jeffery B
Subject: Re: Final GWRA language, please provide comments asap

The responses and modified language are acceptable.

Pamela S. Innis
DOI Topock Remedial Project Manager
Office of Environmental Policy and Compliance
U.S. Department of Interior
P.O. Box 25007 (D-108)
Denver, CO 80225-0007
Voice: 303.445.2502
Fax: 303.445.6320
Cell: 303.501.5685

From: "Meeks, Yvonne J" <YJM1@PGE.COM>
To: "Aaron Yue" <AYue@dtsc.ca.gov>, <Pamela_Innis@ios.doi.gov>, <Carrie-Marr@fws.gov>
Cc: <Lisa.Kellogg@arcadis-us.com>, "Adrienne LaPierre" <alapierre@irisenv.com>, "Gilbert, David" <DAG6@PGE.COM>
Date: 11/09/2009 09:55 AM
Subject: Final GWRA language, please provide comments asap

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groundwater monitoring, particularly in the East Ravine. We note the risk assessment does discuss the implications of elevated detection limits, and the ultimate results and conclusions of the risk assessment are not materially affected by those elevated detection limits. We do believe that it will be beneficial to work with DOI as requested to ensure that current and future monitoring programs meet necessary detection limits.

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We will be working to submit the final document this Friday, November 13. Please let us know if you do not agree with any of these responses ASAP.

Yvonne

From: Aaron Yue [mailto:AYue@dtsc.ca.gov]
Sent: Tuesday, November 10, 2009 2:22 PM
To: Carrie-Marr@fws.gov; Pamela_Innis@ios.doi.gov; Yvonne J Meeks
Cc: Kellogg, Lisa; Adrienne LaPierre; David Gilbert
Subject: Re: Final GWRA language, please provide comments asap

DTSC does not object to the proposed responses.

Aaron

>>> "Meeks, Yvonne J" <YJM1@PGE.COM> 11/9/09 8:54 AM >>>

Pam, Carrie, and Aaron-

We received DOI's November 5th, 2009 comments on the redline/strikeout (RLSO) version of the *Draft Groundwater Human Health and Ecological Risk Assessment of Groundwater Impacted by Activities at Solid Waste Management Unit (SWMU) 1/Area of Concern (AOC) 1 and SWMU2*. In general, PG&E agrees with DOI's requested changes. Below are itemized responses to your general and specific comments, as presented in your November 5, 2009 letter. Especially note underlined portions where the response is slightly modified from or an expansion of the requested language. We request DTSC review of these changes also.

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Yvonne